Monday, June 21, 2021

Late-Breaking Oral Presentations I

Initial Results From STAMPOUT: Study of IXT-M200 in Non-Treatment Seeking Persons Who Use Methamphetamine

W. Brooks Gentry[*1], *Lynn Webster*[2], *Keith Ward*[1], *Misty Stevens*[1]
[1]*InterveXion Therapeutics, LLC; University of Arkansas for Medical Sciences,* [2]*PRA Health Sciences*
Drug Category Stimulants
Topic Substance Use Disorder
Abstract Detail Human
Abstract Category Original Research
Aim: IXT-m200 is a high-affinity, anti-methamphetamine (METH) antibody. The aim of this study was to determine the safety, tolerability and pharmacokinetics (PK) of single IV doses of IXT-m200 followed by weekly IV METH challenges in subjects with METH use disorders. The impacts of IXT-m200 on METH PK and on METH effects as measured by drug effects questionnaires (DEQ) were determined.
Methods: This was a parallel-group, placebo-controlled, double-blind study in otherwise healthy, non-treatment seeking participants. Subjects were required to discriminate METH (30 mg, IV) from placebo with DEQ to qualify. Those who qualified received single doses of IXT-m200 (6 or 20 mg/kg) or placebo followed by weekly METH challenges for up to 4 weeks. The challenges consisted of METH (30 mg, IV) and placebo, separated by 4 hr. Safety, METH and IXT-m200 PK, and DEQ data were collected for up to 126 days.
Results: 56 subjects were included in the pharmacokinetic and safety sets, with 20 receiving the IXT-m200 placebo, 18 receiving 6 mg/kg and 18 receiving 20 mg/kg IXT-m200. IXT-m200 was well-tolerated. There were no SAEs and all AEs were grades 1 and 2; all resolved as expected. Importantly, IXT-m200 did not result in substantial hemodynamic changes when compared with METH alone. IXT-m200 met the primary study endpoint, and significantly ($p<0.001$) altered METH AUC and Cmax with all METH challenges, up to 30-fold and 8-fold respectively without altering METH renal elimination. IXT-m200 decreased METH Vd over 9-fold after the first METH challenge.
Conclusions: IXT-m200 was well-tolerated in non-treatment seeking METH users who were given METH challenges following single doses of IXT-m200. The primary endpoint of alteration in METH PK by IXT-m200 was easily met, with significant ($p<0.001$) changes in METH PK observed. Safety and effect analyses are ongoing, but there were favorable trends in DEQ data.

Extended-Release Lorcaserin for Cocaine Use Disorder Among Men Who Have Sex With Men

Glenn-Milo Santos[*1], *Janet Ikeda*[2], *Phillip Coffin*[2], *John Walker*[2], *Tim Matheson*[2], *Matthew McLaughlin*[2], *Jennifer Jain*[1], *Eric Vittinghoff*[1], *Steven Batki*[3]
[1]*University of California San Francisco,* [2]*San Francisco Department of Public Health,* [3]*UCSF and San Francisco VA Medical Center*
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Detail Human
Abstract Category Original Research
Aim: To determine if men who have sex with men (MSM) with cocaine use disorder (CUD) and actively-using cocaine could be enrolled and retained in a pharmacologic intervention trial of lorcaserin—a novel 5-HT2cR agonist—and determine the degree to which participants would adhere to study procedures.
Methods: This was a phase II randomized, double-blind, placebo-controlled pilot study with 2:1 random parallel group assignment to daily extended-release oral lorcaserin 20 mg versus placebo (clinicaltrials.gov identifier-NCT03192995). Twenty-two of a planned 45 cisgender MSM with CUD were enrolled and had weekly follow-up visits during a 12-week treatment period, with substance use counseling, urine specimen collection, and completion of audio-computer assisted self-interview (ACASI) behavioral risk assessments. Adherence was measured by medication event monitoring systems (MEMS) caps and self-report. This study was terminated early because of an FDA safety alert for lorcaserin's long-term use.

Results: Eighty-six percent completed the trial, with 82% of weekly study follow-up visits completed. Adherence was 55.3% (lorcaserin 51.6% vs. placebo 66.2%) by MEMS cap and 56.9% (56.5% vs. placebo 57.9%) by self-report and did not differ significantly by treatment assignment. Intention-to-treat analyses (ITT) did not show differences in cocaine positivity by urine screen between the lorcaserin and placebo groups by 12-week follow-up (IRR: 0.96; 95%CI = 0.24-3.82, P=0.95). However, self-reported cocaine use in timeline follow-back declined more significantly in the lorcaserin group compared to placebo (IRR: 0.66; 95%CI = 0.49-0.88; P=0.004).
Conclusions: We found that it is feasible, acceptable, and tolerable to conduct a placebo-controlled pharmacologic trial for MSM with CUD who are actively using cocaine. Lorcaserin was not associated with significant reductions in cocaine use by urine testing but was associated with significant reductions in self-reported cocaine use. Future research may be needed to continue to explore the potential utility of 5-HT2cR agonists.

Dose-Specific Effects of Pregnenolone on Stress-Induced Craving and Anxiety in Cocaine Use Disorder

Verica Milivojevic[1], Zachary Magin[1], Philip Himmelstein[1], Gretchen Hermes[1], Gustavo Angarita[1], Rajita Sinha[1]*
[1]*Yale University School of Medicine*
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Detail Human
Abstract Category Original Research
Aim: Chronic substance use related adaptations have been shown to down-regulate GABAergic transmission (Biggio et al., 2007) and levels of neuroactive steroids (Purdy et al., 1991), which are potent modulators of the GABAA receptor. Moreover, chronic drug use results in significant changes to stress biology which contributes to high stress-induced craving and anxiety and risk of relapse (Milivojevic and Sinha, 2018). Therefore, interventions that could potentiate the neurosteroid system and thereby normalize drug use-related adaptations in the stress system may prove clinically relevant in the larger treatment of substance use disorders (SUDs). Here we tested the effects of two doses of the neuroactive steroid precursor pregnenolone (PREG) vs. placebo (PLA) on stress-induced craving and anxiety in treatment seeking individuals with substance use disorder (SUD).
Methods: Eleven inpatient treatment-seeking individuals with SUD were randomly assigned to receive either placebo (PLA; n=4), 300mg PREG/day (n=3) or 500mg PREG/day (n=4). In week 2, they were exposed to three 5-minute personalized guided imagery conditions (stress, drug cue, neutral/relaxing), one per day, on three consecutive days in a random, counterbalanced order. Craving and anxiety were assessed at baseline, immediately following imagery exposure and at regular recovery time points.
Results: Individuals receiving 500mg PREG had lower craving compared to individuals receiving 300mg PREG or PLA. Moreover, individuals in the 300mg PREG and the 500mg PREG group had significantly lower anxiety ratings compared to the PLA group.
Conclusions: Findings highlight dose-specific reductions in stress-induced craving and anxiety in individuals with SUD receiving PREG treatment.

Defining GM-CSF as a Mediator of Behavioral and Molecular Responses to Cocaine

Kelsey Lucerne[1], Drew Kiraly[1]*
[1]*Icahn School of Medicine at Mount Sinai*
Select Drug Category Stimulants
Topic Neurobiology/Neuroscience
Abstract Detail Animal Study
Abstract Category Original Research
Aim: The gut microbiome markedly effects behavioral and neurobiological responses to cocaine, but the precise mechanisms underlying gut-brain communication are not fully understood. Here we investigate the hypothesis that the immune system acts as a gut-brain mediator of response to cocaine.
Methods: Quantitative serum multiplex analysis measured circulating cytokines in mice with intact or depleted gut microbiomes after chronic cocaine or saline (n=10/group). Mice with intact or depleted microbiomes, receiving daily injections of GM-CSF (10µg/kg) or vehicle, underwent a cocaine conditioned place preference (CPP) assay to measure preference for 2 doses of cocaine (7.5mg/kg or 3.75mg/kg) (n=8/group). Quantitative polymerase chain reaction (qPCR) and RNAscope in-situ hybridization were used to quantify GM-CSF receptor

expression in the nucleus accumbens (NAc) following cocaine treatment (n=5/group). NAc tissue from GM-CSF+cocaine treated animals was used for RNA-sequencing (n=8/group). Pairwise comparisons used two-tailed Student's t-test, 2×2 comparisons used two-way ANOVA with repeated measures and Holm-Sidak's post-hoc tests, and limma analysis was used for RNA-seq.
Results: Multiplex analysis identified granulocyte-macrophage colony-stimulating factor (GM-CSF) to be significantly increased by repeated cocaine only in animals with an intact gut microbiome. On the CPP test, microbiome-depleted animals injected with vehicle developed a robust place preference for low doses of cocaine, as seen in our previously published data. However, injection of microbiome-depleted animals with GM-CSF returned place preference to control levels. Further, GM-CSF attenuated cocaine preference in microbiome-intact animals. qPCR and RNAscope showed cell-type specific cocaine-induced increases in GM-CSF receptor expression in the NAc. Further, RNA-sequencing found GM-CSF+cocaine treatment altered genes related to synaptic function in the NAc.
Conclusions: Altogether, these data suggest that GM-CSF plays a central role in cocaine-induced behavioral and molecular plasticity, highlighting it as a novel neuroimmune signaling pathway involved in preclinical models of behavioral and molecular response to cocaine.

Effects of Pregabalin on the Ventilatory Depressant Effects of Heroin and Their Reversal by Naloxone

Shawn Flynn[*1], Charles France*[1]
[1]*University of Texas Health Science Center at San Antonio*
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Drug Interactions
Abstract Detail Animal Study
Abstract Category Original Research
Aim: Recent epidemiological studies suggest that co-use of gabapentinoids (e.g., pregabalin) and opioids increases the risk of opioid-related death or respiratory depression requiring naloxone reversal, and post-mortem studies have found gabapentinoids present in up to 40 percent of drug overdose cases, primarily those involving opioids. The aim of this study was to determine the effects of pregabalin pretreatment on the ventilatory depressive effects of heroin, and their reversal by naloxone.
Methods: Male Sprague Dawley rats were given pregabalin (1-178 mg/kg; i.v.) or saline (i.v.) prior to increasing doses of heroin with ventilation monitored by whole-body plethysmography. Sessions consisted of a 30-minute baseline period, followed by a 41-minute test period. A multiple-cycle cumulative dosing procedure was used with rats receiving infusions of heroin or saline at minutes 0, 3, and 6, during the test period of each session; each infusion of heroin resulted in a cumulative dose of 0.178, 0.56, and 1.78 mg/kg, respectively. Naloxone (0.01-0.032 mg/kg) or saline was administered i.v. 5 minutes following the last infusion of heroin. The primary outcome of the study was minute ventilation–the volume of air ventilated per minute.
Results: Heroin dose-dependently reduced minute ventilation. Pretreatment with pregabalin dose-dependently enhanced the effects of 0.178 and 0.56 mg/kg heroin. Naloxone dose-dependently reversed the ventilatory depressive effects of heroin regardless of pretreatment condition. However, the magnitude of reversal was dose-dependently attenuated by pregabalin.
Conclusions: Pregabalin was shown to enhance the ventilatory effects of heroin and attenuate their reversal by naloxone. Future studies will determine the nature of interactions between gabapentinoids and opioids in the context of ventilation, and whether the observed effects on naloxone reversal are simply due to the enhancement of the opioid effect or if gabapentinoids interact with naloxone directly.

Morphine Evokes a Neuroimmune Response in Healthy Volunteers: Implications for Opioid Use Disorder

Eric Woodcock[*1], Gustavo Angarita*[2], David Matuskey*[2], Jim Ropchan*[2], Nabeel Nabulsi*[2], Yiyun Henry Huang*[2], Ansel Hillmer*[2], Richard Carson*[2], Kelly Cosgrove*[2]
[1]*Wayne State University,* [2]*Yale University*
Select Drug Category Opiates/Opioids
Topic Neurobiology/Neuroscience
Abstract Detail Human
Abstract Category Original Research

Aim: Preclinical studies indicate that opioid administration evokes pro-inflammatory responses in the periphery and brain. These pro-inflammatory responses influence both appetitive and dysphoric addiction processes and thus, may influence the development of opioid use disorder (OUD) and/or perpetuate continued opioid use. Here, we investigated the acute neuroimmune effect of morphine using Positron Emission Tomography (PET) imaging with [11C]PBR28 which binds to the 18kDa translocator protein (TSPO), a marker sensitive to pro-inflammatory stimulation.
Methods: This study included 10 healthy individuals with prior medical opioid exposure (3F; 34.7yrs [range=26-49yrs]; BMI=26.4 [range=20-33]). In one day, subjects completed two 120-minute [11C]PBR28 PET scans: one before and one 2-hours after intramuscular morphine administration (0.04mg/kg or 0.07mg/kg ['low' vs. 'high' dose]). Arterial blood was acquired during each scan to measure the metabolite-corrected input function. Total volume of distribution (VT), i.e., TSPO availability, was estimated in 12 brain regions using multilinear analysis-1 (MA-1; t*=30). The effect of morphine on regional [11C]PBR28 VT was evaluated using linear mixed effects models with rs6971 Genotype ('high' vs. 'moderate' affinity binders), morphine Dose ('low' vs. 'high'), and Time ('pre-' vs. 'post'-morphine) as fixed factors and regional VT as the within-subject repeated factor.
Results: A significant Time effect indicated that morphine increased regional TSPO availability, $F(1,203)=282.2$, $p<.001$. The Dose-by-Time interaction was non-significant ($p=.11$). Reanalysis, after exclusion of one non-responder, improved model fit and revealed a significant Time effect, $F(1,180)=361.7$, $p<.001$, and Dose-by-Time interaction, $F(1,180)=13.3$, $p<.001$, indicating that regional TSPO availability increased significantly more after the 'high' vs. 'low' morphine dose (38-52% vs. 19-30%).
Conclusions: Our findings indicate that morphine evokes a neuroimmune response across brain regions, the first such evidence in people. These data highlight the potential role of the neuroimmune system in the development of OUD. Future studies are needed to investigate opioid-neuroimmune relationships in OUD patients and medications to mitigate this effect.

Experimental Traumatic Brain Injury Upregulates the CNR2 Gene in the Cerebral Vasculature: A Role for Cannabinoid Receptors in Inflammation Resolution at the Blood Brain Barrier

Trent Bullock[1], Jana A. Kahn[1], Tetyana P. Buzhdygan[1], Allison M. Andrews[1], Servio H. Ramirez[1]*
[1]*Lewis Katz School of Medicine at Temple University*
Select Drug Category Cannabis/Cannabinoids
Topic Neurobiology/Neuroscience
Abstract Detail Animal Study
Abstract Category Original Research
Aim: Previous studies have shown that cannabinoid receptor 2 (CB2) agonists attenuate TBI associated neuroinflammation. However, the mechanism of CB2 mediated neuroprotection remains unclear. We hypothesized that the cerebral vasculature is a site of CB2 activation that promotes blood brain barrier protection. Here, the induced expression profile of CNR2 in brain endothelium is evaluated during the acute phase of experimental TBI.
Methods: In experiment one, C57BL/6 mice were given a moderate TBI (n=12) using the controlled cortical impact model (CCI/ 4.5m/s, 2mm impact depth) and compared to naïve (n=6) and sham injured controls (n=12). Vascular CNR2 expression was analyzed via qRT-PCR and RNAscope 4-, 8-, 24-, and 48-hours post-injury. In experiment two, primary human microvascular endothelial cells were cultured and treated with ipopolysaccharide (LPS), Tumor Necrosis Factor-a (TNFa), or a combination of these and the novel CB2 agonist, PM289. Subsequently, protein expression was analyzed via western blot of whole cell and subcellular fractions, and endothelial barrier integrity was analyzed via Electrical Substrate Impedance Sensing (ECIS). Results of each experiment were analyzed with one or two-way ANOVA as appropriate.
Results: Following CCI-TBI, qPCR revealed a 19-fold upregulation of CNR2 compared to sham and naïve animals ($F(7, 12)=7.577$, $p<.01$) at 24 hours. These results were confirmed with RNAscope. ECIS experiments showed that TNFa and LPS induced endothelial barrier disruptions were at least partially prevented by concurrent treatment with the novel CB2 agonist, PM289. TNFa treatment also upregulated CB2 on endothelial membrane fractions.
Conclusions: Our results indicate upregulation of CNR2 in the cortical microvasculature 24hrs following a CCI-TBI. Ongoing experiments will determine if this change is consistent at the protein level. ECIS experiments suggest vascular CB2 is able to prevent inflammation-induced BBB disruption, potentially contributing to

neuroprotection following neurotrauma. Together, these findings support vascular CB2 as a novel treatment target following brain injury.

Comparing Cannabis, Alcohol, and Tobacco Outcomes Using a Unique Co-Twin Control Design of Twin Pairs Discordant for Living in a State With Recreational Cannabis Legalization

J. Megan Ross[*1], Hollis Karoly[2], Stephanie Zellers[3], Jarrod Ellingson[1], Scott Vrieze[3], Matt McGue[3], Robin Corley[4], William Iacono[3], John Hewitt[4], Christian Hopfer[1]*
[1]University of Colorado Anschutz Medical Campus, [2]Colorado State University, [3]University of Minnesota, [4]University of Colorado Boulder

Select Drug Category Cannabis/Cannabinoids
Topic Policy
Abstract Detail Human
Abstract Category Original Research

Aim: The aims are to compare twin pairs that are discordant for living in a recreational cannabis legalized (RCL) state on: 1) past-year endorsement of cannabis, alcohol, tobacco, and other illicit drug use, 2) past six-month frequency of cannabis, alcohol, and tobacco, 3) past-year number of negative consequences from cannabis and alcohol use, 4) frequency of co-using cannabis with alcohol and cannabis with tobacco and, 5) past-year average number of drinks per episode and highest number of drinks consumed in one day.
Methods: The current study used a novel co-twin control study design of 211 adult twin pairs (N=422 individuals) who are discordant for living in a state with RCL, thereby controlling for genetic and environmental factors shared by members of a family. We conducted matched-paired t-test (continuous outcomes) and McNemar's test (categorical outcomes) to compare substance use outcomes within twin pairs.
Results: Results indicated that the twins living in a RCL state endorsed higher rates of past-year cannabis use (RCL: 34% vs. non-RCL: 25%; $\chi 2=5.31$, p=.021) and greater frequency of past six-month cannabis use (RCL: Mean=18 days vs. non-RML: Mean=10 days; t=2.26, p=.025) compared to their co-twin in a non-RCL state. The twins living in the RCL state reported lower frequency of past six-month alcohol use (RCL: Mean=39 days vs. non-RCL: Mean=47 days; t=2.10, p=.037) and fewer negative consequences from alcohol (RCL: Mean=2.4 vs. non-RCL: Mean=3.3; t=2.73, p=.007) compared to their co-twin in a non-RCL state. The twin living in a RCL state endorsed greater frequency of co-using cannabis and alcohol (RCL: Mean=1.9 vs. non-RCL: Mean=1.6; t=2.79, p=.006) but not co-using cannabis and tobacco. We did not observe any group differences on tobacco or illicit drug outcomes.
Conclusions: These results support the theory that cannabis may serve as a substitute for alcohol, specifically in environments with more liberal cannabis policies.

Mindfulness-Oriented Recovery Enhancement for Opioid Misuse and Chronic Pain in Primary Care: A Full-Scale Randomized Controlled Trial

Eric Garland[*1], Adam Hanley[1], Yoshio Nakamura[1], Brett Froeliger[2], Gary Donaldson[1]*
[1]University of Utah, [2]University of Missouri

Select Drug Category Opiates/Opioids
Topic Alternative Medicine
Abstract Detail Human
Abstract Category Original Research

Aim: Successful treatment of opioid misuse among people with chronic pain has proven elusive. Here we present late-breaking results from a full-scale, NIDA R01-funded randomized clinical trial (RCT) of Mindfulness-Oriented Recovery Enhancement (MORE). Rooted in affective neuroscience, MORE unites training in mindfulness, reappraisal, and savoring to restructure reward mechanisms underpinning opioid misuse and OUD.
Methods: Opioid misusing chronic pain patients (N=250; 62% with full OUD) were randomized (1:1) to 8 weeks of MORE or a supportive group (SG) psychotherapy control delivered in a primary care setting. Primary outcomes were opioid misuse—as measured by the Drug Misuse Index (DMI), a composite measure triangulating self-report with blinded clinical interview and urine drug screen—and scores on the Brief Pain Inventory (BPI) through 9-month follow-up. Secondary outcomes were opioid dose, distress, and ecological momentary assessments of

craving. Psychophysiological responses to opioid cues and natural reward cues were assessed as a mediating mechanism.
Results: By 9-month follow up, 46% of patients in MORE no longer met criteria for opioid misuse, compared to 23% in the SG, with an overall per visit odds ratio for lower misuse in MORE (relative to SG) of 2.05 (p=0.011). Additionally, subjects randomized to MORE demonstrated reduced pain interference (p<0.001), reduced pain severity (p=0.003), and were more likely to decrease opioid use by at least 50% (36% in MORE vs. 15% in the SG, p=0.009). MORE also reduced distress (p=0.026) and craving (p=0.002). Finally, MORE shifted autonomic responses to drug and natural rewards; this restructuring of reward salience mediated the effect of MORE on reducing opioid misuse.
Conclusions: MORE resulted in large improvements in opioid misuse, opioid dosing, craving, and chronic pain symptoms that were maintained 9-months after the end of treatment, demonstrating the efficacy of this novel intervention for treating opioid misuse among people with chronic pain.

Results of the 2020 CPDD Membership Survey: We Are More Diverse Than Suggested by Earlier Survey Approaches

Caitlyn Hood[*1], Albert Garcia-Romeu[2], Angela Moreland[3], Sherecce Fields[4], Jack Henningfield[5], Virmarie Correa-Fernandez[6], Marcel de Dios[6], Angela Heads[7], Thomas Hudzik[8], Timothy Regan[4], Anne Skinstad[9]*
[1]University of Kentucky, [2]Johns Hopkins University School of Medicine, [3]Medical University of South Carolina, [4]Texas A&M University, [5]Pinney Associates, Inc., [6]University of Houston, [7]University of Texas Health Science Center, [8]BlueRock Therapeutics, [9]University of Iowa
Select Drug Category Other
Topic Other
Abstract Detail Human
Abstract Category Original Research
Aim: Efforts to advance equity, inclusion, and diversity within CPDD are vital to increasing innovation and excellence in addiction science and relevance to societal and public health needs. This project examines open-ended responses aimed at characterizing diversity and inclusion within CPDD's membership.
Methods: Individuals on a CPDD listserv were contacted via email to participate in an online survey of 10 items (N = 657). Demographic questions included an option for self-identification ("None of these describe me. I describe myself as ____.") and an option to select if they preferred not to answer. Respondents reported membership status, time since terminal degree completion, perceptions of welcomeness within the organization, and given an opportunity to provide feedback on efforts to enhance diversity and inclusion within CPDD.
Results: Earlier survey approaches only allowed the selection of one of six ethnic/racial options and male vs. female or other. Whereas the majority of responses fit the old categories, 14% identified with one of the new ancestry options, 6% used another self-descriptor, and 10% wrote in their own responses. Regarding gender identity, 1% selected an option other than man or woman. 15% reported their sexual orientation as gay/lesbian, bisexual, or chose to self-identify as queer, asexual, pansexual, demisexual, and open. Perceptions of welcomeness ("inclusion") varied as a function of several factors including ancestry, age, gender identity, and sexual orientation. Efforts to enhance diversity revolved around six main themes, including broadening the definition of diversity; suggestions to address barriers; making diversity an ongoing commitment; increasing diversity into presentations; suggestions to increase opportunities; and measurement of diversity.
Conclusions: Our findings suggest using expanded response options can more comprehensively characterize the diversity of CPDD members. We aim to use these findings to inform a data-driven approach that will guide efforts to foster a more inclusive and equitable scientific community.

Late-Breaking Oral Presentations II - COVID

Potential Impact of Mask-Wearing on Intranasal Absorption of Naloxone

Judy Ashworth[*1], Vicki G Davis[2], Marion Coe[1], Richard Mannion[2], Michael Hufford[2]*
[1]Pinney Associates, Inc., [2]Harm Reduction Therapeutics, Inc.
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Detail Human
Abstract Category Original Research

Aim: To alert other researchers and those treating individuals with opioid use disorder of the potential impact that prolonged mask-wearing may have on the intranasal absorption of naloxone particularly within the first few minutes of administration.
Methods: A randomized, open label, 2-sequence, 4 period, single-dose, crossover study was conducted to assess the relative bioavailability and pharmacokinetics of HRT001 naloxone HCL nasal spray 3 mg relative to 0.4 mg intramuscular (IM) naloxone. Subjects (n=38) were randomized into 1 of 2 treatment sequence groups and on Day 1 of each period, received a single dose of naloxone followed by 10 hours of in-house PK blood sampling. The primary PK endpoints (AUC0-t, AUC0-5, AUC0-inf, and Cmax) were loge-transformed and compared between the two treatments using an analysis of variance (ANOVA) model for a replicated crossover study design with fixed effects for sequence, treatment, and periods, and random effect for subject. Due to COVID-19 restrictions, subjects were required to wear KN-95 masks from arrival at the site (approximately 24 hours prior to study drug administration) until discharge from the unit, except briefly for the intranasal administration of HRT-001.
Results: The early absorption of naloxone from HRT001 3mg was markedly lower than anticipated based on results from a prior study which evaluated the same naloxone intranasal formulation at 1, 2 and 4mg. During the first 10 minutes post-dosing, mean plasma concentration versus time profiles for naloxone following HRT001 were lower than those observed following naloxone 0.4 mg IM and similar to those seen with the 1mg dose in the prior study.
Conclusions: The unexplained results of this study raise concern that early intranasal absorption of naloxone may be impaired following prolonged mask-wearing due to changes to the micro-environment beneath the mask (e.g. humidity leading to liquid droplet formation along the nasal mucosa, increased mucous production) and should be explored.

Disparities by Sex in COVID-19 Risk and Related Harms Among People With Opioid Use Disorder

Caitlin Martin[*1], Bhushan Thakkar[1], DaShaunda Diane Hilliard Taylor[1], Jong Hyung Lee[1], Derek A Chapman[1]*
[1]*Virginia Commonwealth University*
Select Drug Category Opiates/Opioids
Topic Sex/Gender Differences
Abstract Detail Human
Abstract Category Original Research
Aim: Recent evidence indicates increased risks of COVID-19 morbidity and mortality among individuals with substance use disorder, with a possible female disadvantage for opioid use disorder (OUD) contrary to males in the general population. COVID-19 outcomes have yet to be assessed using sex-stratified data to identify differential impacts between males and females. Study aims were to: (1) Report sex-specific COVID-19 outcomes, opioid overdose, and mortality among individuals with OUD at a public safety net health system; (2) Assess sex-specific factors associated with 60-day all-cause, in-hospital mortality within a socioecological framework.
Methods: All patients receiving a SARS-CoV-2 test in year 2020 with OUD (ICD-10 and/or buprenorphine/naltrexone prescription) were included. Bioinformatic search criteria abstracted outcomes from the medical record from January 1, 2020, through 60 days after the SARS-CoV-2 test. Analysis was performed in SAS. Chi-squared and Student t-tests assessed differences by sex. Multivariable regression was used for Aim 2, with results pending at this time.
Results: Data was abstracted for 2,600 patients with OUD (1,294 males; 1,306 females). A third were over 60 years, and the majority were Black (52%) with public insurance (Medicaid 28%, Medicare 31%). Most were overweight (male mean BMI 28) or obese (female mean BMI 31; $p<0.001$). Approximately half were smoking cigarettes (male 52%, female 40%; $p<0.001$). Across sex, 5% had a positive SARS-CoV-2 test ($p=0.42$) with similar incidences of hospitalization, ICU admission, and mechanical ventilator use. More males (10%) presented with an overdose than females (4%; $p<0.001$) and died as a result (males n=5; females n=0). However, 60-day all-cause, in-hospital mortality did not differ by sex (males 5%, females 4%; $p=0.42$).
Conclusions: Sex is an important biological variable that modifies health, including OUD and COVID-19. Within a majority Black population, COVID-19 outcomes were similar across sex, but males and females with OUD may differ in predisposing factors.

Struggling With Recovery From Opioids: Who is at Risk During COVID-19?

Diana Keith[1], Allison Tegge[1], Jeffrey Stein[1], Liqa Athamneh[1], William Craft[1], Howard Chilcoat[2], Anne Le Moigne[2], Angela DeVeaugh-Geiss[2], Vijay Nadipelli[3], Caitlyn Solem[4], Victoria Albright[5], Warren Bickel[1]*
[1]Fralin Biomedical Research Institute at VTC, [2]Indivior, Inc., [3]Acceleron Pharma, [4]Patient Centered Outcomes, Pharmerit - An OPEN Health Company, [5]CamBright Research LLC

Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Detail Human
Abstract Category Original Research

Aim: Individuals in recovery from opioid use disorder (OUD) are particularly vulnerable to the impacts of the COVID-19 pandemic. Recent findings indicate an increased risk for relapse and overdose linked to COVID-related stress, isolation, and reduced access to healthcare. We aimed to identify individual-level factors associated with COVID-19–related impacts on recovery.
Methods: This observational study (NCT04577144) enrolled, during the pandemic, 216 participants who previously took part in long-acting buprenorphine subcutaneous injection clinical trials (2015-2017) for moderate-to-severe OUD. Participants indicated how the COVID-19 crisis affected their recovery from substance use on a 5-point scale, with responses ranging from “much easier” to “much harder.” A machine learning approach, Classification and Regression Tree (CART) analysis, examined the association of 28 variables with self-reported impact of COVID-19 on recovery, including demographics (e.g., race, education, employment), substance use (e.g., opioid craving/withdrawal, treatment utilization), and psycho-social factors (e.g., depression, quality of life, stress). Ten-fold cross-validation was used to minimize overfitting.
Results: Twenty-six percent of the sample analyzed reported that COVID-19 had made recovery somewhat or much harder. Past-month abstinence rates were lower among those who reported recovery was harder compared to those who did not (49% vs. 76%, respectively; $p<.001$). The final classification tree (overall accuracy 80%) identified the Beck Depression Inventory (BDI-II) as the strongest independent risk factor associated with reporting COVID-19–related impact. Individuals with a BDI-II total score ≥10 had 6.45 times greater odds of negative impact (95% CI: 3.29-13.30) relative to those who scored <10. Among individuals with higher BDI-II scores, less progress in managing substance use (Treatment Effectiveness Assessment) and receiving treatment within the past 2-3 years were also associated with negative impacts.
Conclusions: These findings underscore the importance of monitoring depressive symptoms and perceived progress in managing substance use among those in recovery from OUD, particularly during large-magnitude crises.

Alcohol Use and Problems in U.S. Military Veterans During the COVID-19 Pandemic: Results From the 2019-2020 National Health and Resilience in Veterans Study

Melanie Hill[1], Marc Potenza[2], Robert Pietrzak[3]*
[1]University of California, San Diego; VA San Diego Healthcare System, [2]Yale University School of Medicine, [3]VA Connecticut Healthcare System

Select Drug Category Alcohol
Topic Epidemiology
Abstract Detail Human
Abstract Category Original Research

Aim: To test the hypothesis that alcohol use disorder (AUD) may have increased during the coronavirus-2019 (COVID-19) pandemic among U.S. military veterans, and to identify factors associated with peri-pandemic alcohol use and problems.
Methods: Data were analyzed from the 2019-2020 National Health and Resilience in Veterans Study, a nationally representative, prospective cohort study of 3,078 veterans. To test for pandemic-related changes in the prevalence of AUD, a McNemar’s test was conducted to compare pre- and peri-pandemic rates of positive screens for AUD. Multiple regression analyses were then conducted to identify pre- and peri-pandemic correlates of alcohol use and problems.
Results: The prevalence of AUD remained stable from pre- (10.1%) to 1-year peri-pandemic (9.6%). During the pandemic, 2.7% of veterans developed incident AUD. Among veterans who abstained from alcohol prior to the pandemic, 12.3% developed low-risk drinking and 0.5% developed moderate-to-severe AUD during the pandemic. Among veterans reporting pre-pandemic low-risk drinking, 4.0% developed hazardous drinking, and

0.1% developed moderate-to-severe AUD during the pandemic. Among veterans reporting pre-pandemic hazardous drinking, 9.5% developed moderate-to-severe AUD during the pandemic. Younger age, male sex, lifetime substance use disorder, and increased loneliness during the pandemic predicted higher levels of alcohol consumption, over-and-above pre-pandemic alcohol consumption. Lower income, lifetime substance use disorder, lifetime suicide attempt, greater pre-pandemic psychiatric distress, increased psychiatric distress and loneliness during the pandemic, and COVID-19 infection of a household member predicted higher levels of alcohol problems, over-and-above pre-pandemic alcohol problems.
Conclusions: Although the prevalence of AUD among U.S. veterans remained stable during the COVID-19 pandemic, certain veteran groups may be at greater risk for pandemic-related increases in alcohol use and problems. These veterans may benefit from targeted intervention.

Loneliness, Social Isolation, and Drinking During COVID-19

Michael Fendrich[*1], Crystal Park[1], Beth Russell[1], Jessica Becker[1], Morica Hutchison[1]*
[1]University of Connecticut
Select Drug Category Alcohol
Topic Epidemiology
Abstract Detail Human
Abstract Category Original Research
Aim: To understand the association between loneliness, isolation and drinking during the COVID-19 pandemic.
Methods: We conducted a multi-wave survey of US adults using the MTurk platform to assess stress, coping, drinking and other substance use during the pandemic. We analyze data from our second wave of data collection (n=842), occurring in May 2020 to investigate the association of loneliness and isolation with: hazardous drinking (based on the AUDIT-C), reports of 5 or more drinks at a sitting (binge drinking), average number of drinks per week, and past month drinking frequency (number of days drinking).
Results: In logistic regression models controlling for age and gender, loneliness was associated with significantly increased odds of binge drinking and elevated drinking days during the past 30 days (6 or more days drinking). Isolation was associated with increased odds of hazardous drinking, a higher number of average drinks per week, and increased odds of elevated drinking days (6 or more days drinking). Isolated individuals drank on average 2 more drinks per week compared to others (3.9 vs. 5.9 drinks; t d.f. 840 = 2.51; $p < .05$). In models simultaneously including both isolation and loneliness, there was some preliminary evidence suggesting that loneliness mediated the impact of isolation on hazardous drinking (the odds ratio for isolation dropped from 1.51 to 1.44 and the p value became non-significant), number of drinks per week (the odds ratio for isolation dropped from 6.88 to 5.43) and drinking days (the odds ratio for isolation dropped from 1.49 to 1.37 and the p value became non-significant).
Conclusions: Isolation and loneliness are distinct constructs (r=.17) that are associated with drinking outcomes in different ways. Treatment and prevention strategies promoting social connectedness are particularly salient during the pandemic. These findings, however, have more general implications for prevention that extend beyond this very challenging period.

Self-Reported Increases in Cannabis Use During the COVID-19 Pandemic Associated With Cannabis Use Disorder (CUD) Symptoms, Consequences, and Amphetamine Misuse Among College Students With CUD

Alan Davis[*1], Brooke Arterberry[2], Yitong Xin[1], Corrine M. Schwarting[2], Erin Bonar[3], Paul Nagib[1]*
[1]The Ohio State University, [2]Iowa State University, [3]University of Michigan
Select Drug Category Cannabis/Cannabinoids
Topic Substance Use Disorder
Abstract Detail Human
Abstract Category Original Research
Aim: Explore the self-reported impact of the COVID-19 pandemic on cannabis use and other substance use behaviors among college students meeting criteria for cannabis use disorder (CUD).
Methods: Data include cross-sectional baseline data (collected in November and December 2020) from an ongoing prospective cohort study of college students meeting criteria for CUD at a large public university in the mid-Western United States (N=150; Mean age=20.6, SD=2.4; female=57%; White=90%; Heterosexual=67%). Descriptive analyses, correlations, and paired samples t-tests were conducted.

Results: Compared to cannabis use prior to the pandemic, participants retrospectively reported an increase in cannabis use during the first phase of the pandemic when state, local, and university stay-at-home/quarantine orders were in place (d=.42; p<.001). This increase in cannabis use during the first phase of the pandemic was correlated with number of CUD symptoms (r=.36, p<.001), cannabis use consequences (r=.26, p<.01); and greater cannabis use (r=.28, p<.01), reported eight months after the pandemic began. Participants retrospectively reported an increase in their consumption of cannabis through smoking (57.3%), vaping (26.6%), dabbing (25.3%), eating (34.7%), drinking (12.0%), and skin absorption (2.7%), during the pandemic compared to the 30 days prior to the onset of the pandemic. Reporting greater cannabis use in the 30 days prior to the study was associated with an increase in the use of amphetamine-type drugs not as prescribed (r=.29; p<.001) and consuming cannabis by dabbing (r=.35; p<.001) since the pandemic began.
Conclusions: These data suggest that many college students with CUD experienced an increase in cannabis use during the first phase of the pandemic, which was associated with greater CUD symptoms and related consequences. Of concern, greater cannabis use was also associated with reported increase in misuse of amphetamine-type drugs. Future research should explore long-term effects of the COVID-19 pandemic on CUD outcomes in this at-risk population.

Using Videocalling to Observe Medication Adherence and Collect Daily Patient Reported Outcomes in SUD Trials During the Pandemic and Beyond

Alexandria Selloni[1], Aarti Gupta[2], Deepak D'Souza[2], Mohini Ranganathan[2], Rajiv Radhakrishnan[2], Kimberlee Forselius-Bielen[2], Mackenzie Griffin[2], Christopher Artabane[2], Jasmine Patel[2], Christina Luddy[2], Leigh Flynn[2], Gagan Bhatia[2], Laura Cadavid[2], Surbhi Pathania[2], Ali Rashid[2], Anahita Bassir Nia[2], Patrick Skosnik[2], Sandra Gomez-Luna[2]*
[1]Yale University School of Medicine, [2]Yale University School of Medicine, Department of Psychiatry
Select Drug Category Cannabis/Cannabinoids
Topic Technology (e.g., mHealth)
Abstract Detail Human
Abstract Category Original Research
Aim: Collection of patient-reported outcomes (PROs) and accurate measurement of medication adherence is essential in interpreting the results of substance use disorder (SUD) intervention trials where the rates of medication nonadherence are high. The COVID-19 pandemic has further highlighted the urgent need for increased virtual data collection. In an ongoing double-blind, randomized, placebo-controlled multicenter trial for cannabis use disorder that was disrupted by the pandemic we evaluated the feasibility and success of a smartphone-based approach (Cellphone Assisted Remote Observation of Medication Adherence [CAROMA]) to visually confirm daily medication adherence and collect PROs.
Methods: Every morning, male and female subjects (n=19) were video called by research staff who visually confirmed consumption of study medication and PROs of cannabis use, sleep quality, and tolerability over 8 weeks. PROs and medication adherence were also assessed weekly with virtual or in-person visits, pill counts, plasma drug levels, and surveys. Subjects were paid for completing daily CAROMA visits, and for returning the smartphone at study completion.
Results: CAROMA was well received amongst subjects and confirmed 94.33% adherence to medication and daily patient reported outcomes. Concordance between expected and actual remaining study medication counted at weekly study visits was 95.19%. CAROMA was estimated to cost approximately $90 per subject per week − a total of $719.24 per subject for the 8-week treatment phase of the trial. 10.52% of subjects experienced technical difficulties during 11.55% of the days that CAROMA was completed. 84.21% of subjects returned the phones.
Conclusions: Preliminary data demonstrates the feasibility, success and cost-effectiveness of video-calling to facilitate daily collection of PROs and confirm medication adherence in clinical trials. CAROMA demonstrates a viable approach for virtual data collection in large and extensive studies in SUDs. The findings provide support for increased application of CAROMA to adjust to recent constraints in clinical trials caused by the COVID-19 pandemic.

Effectiveness and Acceptance of a Smartphone-Based Virtual Agent Screening for Alcohol and Tobacco Problems and Associated Risk Factors During COVID-19 Pandemic in General Population (KANOPEE)

Marc Auriacombe[*1], Lucie Fournet[1], Lucile Dupuy[1], Jean-Arthur Micoulaud-Franchi[1], Etienne de Sevin[1], Sarah Moriceau[1], Emmanuelle Baillet[1], Jean-Marc Alexandre[1], Fuschia Serre[1], Pierre Philip[1]*
[1]*University of Bordeaux*

Select Drug Category Other, Alcohol, Tobacco
Topic Technology (e.g., mHealth)
Abstract Detail Human
Abstract Category Original Research

Aim: To determine if a smartphone application (KANOPEE) using an embodied conversational agent could identify risk factors for problems with alcohol/tobacco use in the context of the current COVID-19 epidemic; to assess adherence and to evaluate trust and acceptance of the application.
Methods: The conversational agent, named Jane, interviewed participants about perceived problems with use of alcohol and tobacco since pandemic, explored risk for tobacco and alcohol use disorder with the CDS-5 and CAGE and experience of craving for each substance. For those at risk, a brief intervention was implemented by the app. Descriptive, univariate and multivariate analyses were performed to specify personalized associations with reporting a problem with alcohol/tobacco use, descriptive analysis reported experience with the intervention and acceptance and trust in the app.
Results: Between April 22 to October 26, 2020; 1588 French participants completed the KANOPEE interview and 318 answered the acceptance and trust scales. 42% of tobacco users and 27% of alcohol users reported problem use since the pandemic. Positive screening with CDS-5 and CAGE, and craving were associated to experiencing problems ($p<.0001$). Lockdown periods influenced alcohol ($p<.0005$) but not tobacco use ($p>.05$). 88% users reported KANOPEE was easy to use and 82% found Jane to be trustworthy and credible.
Conclusions: Alcohol and tobacco are the most available substances for managing stress in the current pandemic and increase risk for substance use disorder. In this context direct human interactions must be limited and access to usual onsite health services is reduced. eHealth smartphone applications are an alternative for screening and early interventions in the general population. KANOPEE was able to screen for risk factors for substance use disorder and was acceptable to users.

Impact of COVID-19 Pandemic on Illicit Drug Supply and Drug Related Behavior of People who Use Drugs in Georgia – a Prospective Cohort Study

Tamar Mgebrishvili[*1], Irma Kirtadze[2], Ada Beselia[3], Irina Vardanashvili[4], Kostyantyn Dumchev[5], Tetiana Kiriazova[5], David Otiashvili[2]*
[1]*Addiction Research Center,* [2]*Addiction Research Center-Alternative Georgia, Ilia State University, School of Arts and Sciences,* [3]*Addiction Research Center-Alternative Georgia,* [4]*Ilia State University, School of Arts and Sciences,* [5]*Ukrainian Institute on Public Health Policy*

Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Harm Reduction
Abstract Detail Human
Abstract Category Original Research

Aim: To describe impact of COVID-19 on trends in illicit drug use, drug supply, risk behaviors and utilization of drug related services among people who use drugs (PWUD) regularly in Georgia.
Methods: The study employed mix-method approach (quantitative and qualitative) to collect and analyze data. Prospective cohort of 50 Georgian PWUD participated in online quantitative survey conducted repeatedly every other week in April – September 2020. Respondents participated in phone-based qualitative interviews at 3- and 6-month follow-up. Cohort of 4 key informants were interviewed monthly.
Results: Many PWUD switched to use alternative substances when preferable drugs were not available. The number of different substances used by participants declined over the study period from on average 3.5 substances in the past 14 days to 2.1. This decline was significant (aOR=0.92; 95% CI [0.90-0.94]). Perceived availability of most drugs decreased, except for diverted opioid agonist medications. Level of interaction between networks of PWUD increased and the role of a middleman was reinforced in drug supply. When access to sterile injection equipment was limited, PWUD exercised risk-containing injection behaviors that were abandoned once access to

sterile equipment was restored. Despite some interruptions in service delivery during the beginning of lockdown, providers of treatment and harm reduction services showed remarkable flexibility to ensure uninterrupted provision of care.
Conclusions: Services need to develop and implement clear protocols for ensuring uninterrupted service delivery that can be enforced in a future in response to similar epidemics or any other emergency situations. Such protocols should consider positive experience accumulated during the COVID-19 related restrictions but also should elaborate additional new strategies that would allow for rapid adjustments to emergency contexts.

Safer Supply Prescribing in Canada During COVID-19: A National Environmental Scan

Stephanie Glegg[1], Karen McCrae[2], Gillian Kolla[3], Samara Mayer[4], Nadia Fairbairn[4]*
[1]The University of British Columbia, [2]British Columbia Centre on Substance Use, [3]University of Victoria, [4]The University of British Columbia, British Columbia Centre on Substance Use*
Select Drug Category Other, any substance (including opioids, stimulants, benzodiazepines, alcohol, cannabis, etc.)
Topic Harm Reduction
Abstract Detail Human
Abstract Category Original Research
Aim: Pharmaceutical alternatives to the street drug supply are often termed "safer supply." This study compared safer supply prescribing in Canada before and during the COVID-19 pandemic. Our aim was to propose strategies to facilitate implementation and sustainability as a means of decreasing risk of SARS-CoV2 infection and surging drug toxicity deaths exacerbated by the pandemic.
Methods: Safer supply prescribers/programs in place before (March 1, 2020) and during (May 1, 2020) the pandemic were recruited through email and social media based on scoping searches of primary/grey literature, funding lists, professional associations, research/clinical networks, health authorities, and advocacy groups. Environmental scan methodology including a survey and qualitative interviews (n=46) was used to gather information about program and client characteristics, and perceived barriers and facilitators of implementation and operation. Descriptive statistics (frequency, range, proportions) were used to summarize survey data. Qualitative data on barriers and facilitators were coded to the Consolidated Framework for Implementation Research constructs, extracted within each construct, and categorized using thematic analysis to propose recommendations to support scale-up.
Results: Of 103 sites identified in six provinces, 60 (58.3%) were implemented after COVID-19 pandemic onset. Service delivery varied in terms of philosophy/aims, dispensing approach, setting, available services and funding sources, with male and Indigenous client over-representation. Key barriers included: 1) Intervention level: limited evidence, balancing risk, prescribing complexity; 2) External factors: social pressure, inability to meet client needs, pandemic restrictions, policy limitations; 3) Organizational level: lack of resources; 4) Individual level: fear/uncertainty, lack of knowledge/self-efficacy; and 5) Implementation process: engaging prescribers. Recommendations included: building the evidence base, sustained funding, policy change, developing communities of practice and training, client-centered care, and prescriber engagement strategies.
Conclusions: Mapping these mitigating strategies to the barriers to safer supply prescribing informs interventions to enhance access to this emerging harm reduction approach and help address the overdose crisis in Canada.

Monday, June 21, 2021

Full-Oral Communication I: COVID-19

Modeling the Impact of the COVID-19 Pandemic on Alcohol Drinking Trajectories and Health Outcomes

Carolina Barbosa[1], William Dowd[1], Arnie Aldridge[1], Gary Zarkin[1]*
[1]RTI International*
Abstract Detail Human
Select Drug Category Alcohol
Topic Substance Use Disorder

Abstract Category Original Research
Aim: To simulate the impact of drinking trajectories during the COVID-19 pandemic on health outcomes and associated costs among individuals with alcohol use disorder (AUD).
Methods: Alcohol consumption during the pandemic was estimated from a nationally representative survey of 993 adults that collected data on alcohol consumption for February 2020 (before the pandemic) and April 2020 (during the pandemic). Alcohol consumption was measured by transitions among abstinent, low risk, medium risk, high risk, and very high-risk drinking states, as defined by the World Health Organization. We simulated the effect of the pandemic for 10,000 adults with AUD using transition matrices (Barbosa et al., 2019) calibrated to survey results. We examined four scenarios: 1) no pandemic (status quo), 2) pandemic with effects on drinking patterns lasting 1 year, 3) pandemic with effects on drinking patterns lasting 5 years, and 4) pandemic with lifetime effects on drinking patterns. Outcomes included incidence of alcohol-related diseases, life years (LYs), quality-adjusted life years (QALYs), and hospitalization costs.
Results: The survey indicated that alcohol consumption, as measured by drinks per day, increased by 29% from February to April 2020. The pandemic scenarios resulted in lower LYs and QALYs, with larger effects for the lifetime effect scenario (average loss of 1.7 QALYs). Relative to status-quo, over the first five years following the pandemic, incidence of disease and hospitalization costs were higher by 8% and 7% respectively for a 1-year pandemic scenario, and 18% and 17% for a 5-year scenario. For lifetime effects, incidence of disease and costs increased by 19% and 18% ($53,000 vs. $45,000) per person.
Conclusions: Increases in drinking associated with the pandemic result in higher morbidity and losses in life years and quality-adjusted life years that are larger if drinking patterns are sustained. It is urgent to monitor alcohol consumption during and after the pandemic.

Mental Health During the COVID-19 Pandemic: An Institutional Survey of Medical Resident Stress, Depression and Alcohol Consumption

Lauren Das[1], Jeffrey E. Korte[1], Angela Moreland[1], Roman Tate[1], Samantha Matthews[1], Karen J. Hartwell[1]*
[1]Medical University of South Carolina
Abstract Detail Human
Select Drug Category Alcohol
Topic Substance Use Disorder
Abstract Category Original Research
Aim: To determine whether medical residents with greater exposure to COVID-19 patients and high levels of COVID-19 related stress will report increased symptoms of mental health disorders including binge drinking, depression, acute stress and anxiety.
Methods: A cross-sectional survey was sent to 583 medical residents from 24 different specialties at a tertiary medical center in May 2020. Demographics, Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), National Stressful Events Survey PTSD Short Scale (NSESSS) and questions about alcohol intake were collected. Survey assessed current care setting and degree of exposure to COVID-19 positive patients. Residents selected pandemic-related stressors which were then further characterized on a Likert scale to rate the severity of the stressful experience.
Results: The response rate was 52% with 301 completed surveys. In residents with more exposure to patients with COVID-19, there was a significantly higher mean PHQ-9 score of 4.7, compared to residents with less exposure who had a mean PHQ-9 score of 2.6. Although a trend of increase in symptoms of anxiety, acute stress disorder and increase in alcohol consumption was observed with higher levels of exposure to COVID-19 patients, they were not statistically significant. There was a significant association between a higher rating of subjective COVID-19 related stress and being more likely to report symptoms of depression (Rho=0.29), anxiety (Rho=0.36), and acute stress disorder (Rho=0.33) as well as an increase in binge drinking (Rho=0.52).
Conclusions: Medical residents with higher levels of COVID-19 related stressors are at high risk for increased alcohol consumption and symptoms of depression, anxiety, and acute stress disorder irrespective of actual exposure to patients with COVID-19. Residents with higher exposure to COVID-19 patients were more likely to have symptoms of depression. Targeted interventions directed at early identification and treatment of these symptoms would be of benefit to the population of resident physicians.

Worry About COVID-19 in Relation to Cognitive-Affective Smoking Processes Among Daily Adult Combustible Cigarette Smokers

Justin Shepherd[1], Brienna Fogle[1], Lorra Garey[1], Andres Viana[1], Michael Zvolensky[1]*
[1]*University of Houston*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Comorbidities
Abstract Category Original Research
Aim: Cigarette smoking is a known risk factor for severe disease and death from respiratory infection. Initial data suggest that smoking is a risk factor for COVID-19 symptom severity. Exposure to increased pandemic-related stress and subsequent worry about COVID-19 may amplify the desire to smoke to down-regulate distress. The present investigation sought to test this conceptual model by evaluating worry about COVID-19 in relation to COVID-19 coping motives for smoking, perceived barriers for smoking cessation, and smoking abstinence expectancies.
Methods: Participants were 219 daily combustible cigarette smokers (55.7% female, Mage = 41.4 years, SD = 11.1). To evaluate the incremental predictive power of worry about COVID-19, hierarchical regressions were conducted for: COVID-19 coping motives for smoking, perceived barriers for smoking cessation, as well as negative mood, somatic symptom, harmful consequence, and positive consequence abstinence expectancies. All models adjusted for age, sex, race, ethnicity, COVID-19 exposure, smoking rate, e-cigarette use status, and anxiety symptoms.
Results: As expected, worry about COVID-19 was significantly related to COVID-19 coping motives for smoking (B=.21, p<.001) and perceived barriers for smoking cessation (B=.11, p=.006). Worry about COVID-19 also was a significant predictor of smoking abstinence expectancies of negative mood (B=.11, p=.003), somatic symptoms (B=.11, p<.001), and harmful consequences (B=.15, p<.001), but not positive consequences.
Conclusions: The present study provides novel empirical evidence that worry about COVID-19 is related to key cognitive-affective smoking processes beyond the effects of age, sex, race, ethnicity, COVID-19 exposure, smoking rate, e-cigarette use status, and anxiety symptoms. These results highlight the potential utility in assessing level of worry about COVID-19, a transdiagnostic construct, among combustible cigarette smokers to better understand cognitive-affective factors that may maintain smoking behavior in the context of the COVID-19 pandemic.

The Impact of the COVID-19 Pandemic on Smoking Among Vulnerable Populations

Rhiannon Wiley[1], Anthony Oliver[1], Miranda Snow[1], Janice Bunn[1], Anthony Barrows[1], Jennifer Tidey[2], Dustin Lee[3], Stacey Sigmon[1], Diann Gaalema[1], Sarah Heil[1], Catherine Markesich[1], Andrea Villanti[1], Stephen Higgins[1]*
[1]*University of Vermont,* [2]*Brown University,* [3]*Johns Hopkins University School of Medicine*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavior
Abstract Category Original Research
Aim: Accumulating evidence suggests that people have changed their smoking in response to the ongoing COVID-19 pandemic. It remains unclear whether and how the pandemic has affected the smoking of individuals most at risk for tobacco-related health disparities. The current study examined changes in smoking among these populations in response to the COVID-19 pandemic.
Methods: Web-based surveys were distributed to 709 adults with socioeconomic disadvantage, comorbid affective disorders or opioid use disorder who currently smoked cigarettes and had participated in a previous trial investigating the effects of very low nicotine content (VLNC) cigarettes in daily smokers from vulnerable populations. Perceptions of the danger and immediacy of the ongoing pandemic, current smoking, current psychiatric symptoms, and changes in other health-related behaviors in response to the pandemic were examined. Repeated measures analysis was used to compare participants' self-reported pre-COVID (i.e., February of 2020) and current cigarettes per day (CPD). Risk factors associated with tobacco use were included as covariates in the analyses.
Results: Among 332 survey respondents (46.8% response rate), 84.6% were current smokers. Forty-four percent of current smokers reported increases in smoking during COVID, whereas 40.6% reported no change, and 12.5% reported decreases. Overall, current CPD was higher than pre-COVID CPD (12.9±1.0 vs 11.5±1.0; p<.001). Older participants (p=.004) and those with only a high school degree compared to some college (p=.04) had a higher CPD at both timepoints. Opioid-dependent smokers had a higher CPD at both timepoints than smokers with

affective disorders (<0.001). There was no significant main effect of menthol status, sex, ethnicity, study site, assigned VLNC dose in the parent study, or current depression, anxiety or employment status on CPD.
Conclusions: Smoking has generally increased among vulnerable populations during the COVID-19 pandemic. Further analyses examining the role of risk factors on change in CPD will be presented at the June meeting.

Did Drug Use Increase Following COVID-19 Relaxation of Methadone Take-Out Regulations? 2020 Was a Complicated Year

Gavin Bart[*1], Solvejg Wastvedt[1], James Hodges[1], Rebecca Rosenthal[2]*
[1]University of Minnesota, [2]Hennepin Healthcare
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Relaxation of federal regulations for methadone take-out dosing during the COVID-19 pandemic is unprecedented. The impact of this change on drug use is unknown. The purpose of this study is to explore the impact of this federal variance on drug use in a single urban OTP as measured by urine drug testing.
Methods: Urine drug test results from 613 patients receiving methadone were collected from July 2020, following COVID-19-related take-out dose adjustments, with July 2019 for comparison. Using a generalized linear mixed model, we computed the average estimated probability of a positive drug test for each year for each take-out phase. To isolate the effect of changing take-out, we removed the main effect of year, while maintaining the main effect of take-out phase and the interaction between year and phase.
Results: The percent of positive opioid and non-opioid drug tests was higher in July 2020 for all methadone take-out phases compared with July 2019. Take-out phase was significantly associated with opioid and non-opioid drug positive results (p<0.001, each outcome). The association of take-out phase with opioid and non-opioid positive results differed in the two years (year-by-phase interaction p<0.025, each outcome). After removing the year main effect, the rate of positive tests was lower in 2020 for the smallest number of take-out doses, higher for moderate number of take-out doses, and about the same for the highest number of take-out doses.
Conclusions: Positive opioid and non-opioid drug tests increased following the federal variance allowing more methadone take-out doses, but these findings cannot fully be attributed to alterations in take-out schedule.

Full-Oral Communication I: Imaging

Effects of Cocaine Use Disorder and Cocaine Cues on Neurobehavioral Choice Dynamics

Michael Wesley[*1], Joshua Beckmann[1], Aaron Smith[2], Miranda Ramirez[1], Skylar Mays[1], Joseph Alcorn[1], Craig Rush[1], William Stoops[1], Joshua Lile[1]*
[1]University of Kentucky, [2]University of Kansas
Abstract Detail Human
Select Drug Category Stimulants
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: This ongoing study seeks to determine the effects of cocaine use disorder (CUD) and cocaine cues on neurobehavioral choice dynamics within a reinforcement learning (RL) framework. Two versions of a choice task (neutral-vs-neutral cue [N-N] and cocaine-vs-neutral cue [C-N]) are used in which two options are presented and the scheduled delivery of a monetary reinforcer ($0.25) is probabilistic, differs across the two options, and changes unpredictably. We hypothesized that cocaine cues would alter choice parameters in cocaine users (COC) relative to controls (CTRL) and reveal unique neural patterns while evaluating cocaine cues.
Methods: COC (N=12, 5f) and CTRL (N=13, 7f) participants perform the tasks during fMRI scanning across two sessions. Choices and money earned are calculated. Participant- and task-specific RL models include an exchange rate (ER) parameter that captures the substitutability of cue associated rewards. Paired/unpaired statistical tests are used to analyze behavioral data (p<0.05). General linear models isolated participant and task specific neural activity during cue evaluation and group-level associations with ER (p<0.01, uncorrected).
Results: The amount of money earned did not differ by group or task. The number of cue-associated choices (MEAN±SD) differed on C-N, with COC choosing more cocaine cues (183.83±26.30) than CTRL (155.15±8.76, p=0.002). ER parameters were lower on C-N in COC (0.63±0.3) than CTRL (0.94±0.4) but not significantly

different (p=0.53). The exchange amount for cocaine cues was $0.27 in CTRL and $0.34 in COC. During the evaluation of C-N cues, a significant relationship was observed between ER and activity in the ventral medial prefrontal cortex in COC but not CTRL.
Conclusions: These preliminary results agree with prior behavioral research that has demonstrated the influence of cocaine cues on choice and demonstrate that the combination of RL modeling and neuroimaging is useful for capturing unique choice dynamics in CUD.

Behavioral Phenotypes and PET Imaging Studies of Kappa Opioid Receptors in Socially Housed Female and Male Monkey Models of Cocaine Use Disorder.

Bernard Johnson[*1], Kiran Sai[2], Susan Nader[1], Yiyun Henry Huang[3], Michael Nader[1]*
[1]Wake Forest School of Medicine, Department of Physiology and Pharmacology, [2]Wake Forest School of Medicine, Department of Radiology, [3]Yale University, Department of Radiology and Biomedical Imaging
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Cocaine use disorder (CUD) persists as a worldwide public health problem for which there is no FDA-approved pharmacotherapy. Using socially housed monkeys, we showed that there was an inverse relationship between dopamine (DA) D2/D3 receptors (D2/D3R) and vulnerability to cocaine abuse in males (subordinates more vulnerable than dominants), but the opposite in females (dominants more vulnerable than subordinates). The present study extended this characterization to include positron emission tomography (PET) imaging of the kappa opioid receptor (KOR) system; KOR and its endogenous ligand, dynorphin, are implicated in the neurobiological regulation of aversive states, stress and substance abuse. The first aim was to investigate KOR system, combining PET imaging with [11C]EKAP and primate social behavior in cocaine-naïve male and female monkeys (N=8/sex) living in same-sex social groups of 4/pen. The second aim was to extend our research to include measures of impulsivity using a delayed discounting procedure.
Methods: Monkeys were trained under a 1- vs. 3-food pellets delay discounting choice procedure. The primary dependent variable was indifference point (IP), the delay that results in 50% choice for both reinforcers.
Results: In PET studies, the lowest binding potentials across all regions of interest were observed in dominant females and subordinate males; the two most vulnerable phenotypes to cocaine reinforcement. In delay discounting studies, the IP values ranged from 24-104 seconds (Mdn = 35). Preliminary data indicates no sex or social rank differences in IP values. However, redetermining the delay discounting curve resulted in a significantly higher IP values, which were correlated with binding potential in several brain regions in males but not females.
Conclusions: We hypothesize that the redetermined IP values provide an index of adaptability and speculate that this may be a behavioral phenotype that supports epidemiological data that women are more vulnerable than men in developing CUDs.

Intranasal Oxytocin Normalizes Corticolimbic Connectivity in Cocaine Use Disorder During Acute Social stress: A Preliminary Study

Nicholas Bustos[*1], Aimee McRae-Clark[1], Julianne Flanagan[1], Nathaniel Baker[1], Jane Joseph[1]*
[1]Medical University of South Carolina
Abstract Detail Human
Select Drug Category Stimulants
Topic Treatment
Abstract Category Original Research
Aim: Oxytocin is a complex hypothalamic neuropeptide moderating stress and social processes and has shown therapeutic potential for addictive disorders and stress reduction. The goal of this study was to determine whether oxytocin (OT) normalizes corticolimbic functional connectivity (FC) during acute social stress in cocaine use disorder.
Methods: 113 out of 130 randomized participants completed scanning and yielded usable data: 27 healthy controls (HC) and 35 cocaine-dependent (CD) individuals received 24 IUs intranasal-OT and 24 HC and 27 CD received placebo one hour prior to neuroimaging. Three runs of the Montreal Imaging Stress Task were used to induce acute social stress. FC was measured between bilateral amygdala seeds and bilateral orbitofrontal (OFC)

regions using psychophysiological interaction analysis to assess task (stress > control conditions) x seed interactions in the two runs following negative feedback. Generalized linear models examined the effect of diagnosis (CD, HC) and treatment (OT, placebo) on FC.
Results: FC between left amygdala and right OFC was significantly higher on placebo in HC (M=.186, SD=.062) than in CD (M=.009, SD=.050, p=.029). However, under OT this group difference was no longer significant, and connectivity trended negative (HC: M=-.181, SD=.058; CD: M=-.085, SD=.045, p=.241) suggesting that corticolimbic FC may be normalized by OT in CD subjects. Interestingly, FC between right amygdala and left OFC showed a mirror-reversed connectivity profile: both groups showed negative FC on placebo (HC: M=-.278, SD=.079; CD: M=-.067, SD=.063) with HC significantly more negative (p=.038), while OT treatment induced significant positive increases both in HC (M=.160, SD=.073, p<.000) and CD (M=.111, SD=.056, p=.037), which were no longer significantly different between groups (p=.635).
Conclusions: OT potentially normalizes corticolimbic FC profiles in cocaine use disorder under acute social stress, but additional studies with larger samples are needed to understand the generalizability of this preliminary finding.

Effects of Chronic Δ9-Tetrahydrocannabinol (THC) Exposure on Prefrontal Cortex Functional Connectivity in Awake Adolescent Squirrel Monkeys at 9.4T

Bryan Carlson[*1], Lei Cao[1], Jessi Stover[1], Craig Stone[1], Michael Rohan[2], Fernando de Moura[2], Brian Kangas[3], Jack Bergman[2], Jack Bergman[2], Sarah Withey[2], Stephen Kohut[2]*
[1]McLean Hospital, [2]McLean Hospital, Harvard Medical School, [3]Harvard Medical School
Abstract Detail Animal Study
Select Drug Category Cannabis/Cannabinoids
Topic Imaging
Abstract Category Original Research
Aim: Laboratory-based human studies indicate that heavy (i.e., daily or near-daily) cannabinoid use during adolescence may have enduring effects on brain and behavior that persist into adulthood. Of particular interest, the prefrontal cortex, which is known to undergo significant maturation during adolescence, may be particularly vulnerable to the effects of cannabinoids. The present study aimed to examine the brain functional consequences of chronic exposure to Δ9-tetrahydrocannabinol (THC) in drug naïve adolescent nonhuman primates.
Methods: Twelve adolescent squirrel monkeys were gradually acclimated to awake fMRI scanning procedures. Following acclimation, subjects were assigned to one of three groups (n=4: 2 females, 2 males/group) to receive daily intramuscular injections of vehicle, low dose THC (0.3 mg/kg) or high dose THC (3.0 mg/kg) for 6 months. Resting-state fMRI data was acquired during 30-min scan sessions at 9.4 Tesla at baseline (before drug treatment), and at 6 months of daily treatment. A seed region was placed in the bilateral prefrontal cortex (PFC) to assess changes in functional connectivity.
Results: Results show that, relative to the vehicle treated group, the low dose THC group showed broad decreases in PFC functional connectivity with other cortical regions (m/OFC, insula, temporal, motor cortices) and increased connectivity with the cerebellum. In contrast, the high dose THC group showed increased local connectivity within anterior regions including the prefrontal cortex and caudate but decreased connectivity with posterior cortical regions (posterior cingulate, parietal and occipital cortices) and with subcortical regions (thalamus, amygdala).
Conclusions: The present results demonstrate that daily exposure to THC during adolescence causes robust and dosage-related changes in functional connectivity between brain regions that are critical for normal development of both brain and behavior.

Sex Differences in Brain Resting-State Functional Connectivity in Awake Adult Squirrel Monkeys

Jessi Stover[*1], Bryan Carlson[1], Lei Cao[1], Craig Stone[1], Fernando de Moura[2], Sarah Withey[2], Stephen Kohut[2]*
[1]McLean Hospital, [2]McLean Hospital, Harvard Medical School
Abstract Detail Animal Study
Select Drug Category Other, Cathinones
Topic Imaging
Abstract Category Original Research

Aim: Until recently, sex as a biological variable was often neglected as various research domains predominantly used only male subjects. Recent studies suggest pronounced sex differences in behavior related to substance use disorders; however, the mechanisms underlying differential abuse-related effects between the sexes remains unclear. Magnetic resonance imaging (MRI) is a non-invasive procedure that can be used to characterize in vivo neural mechanisms. The aim of this study was to identify sex differences in the large-scale functional organization of the brain using resting state functional connectivity (rs-fMRI) analysis in awake squirrel monkeys.
Methods: Fifteen (eight female and seven male) drug naive adult squirrel monkeys (Saimiri sciureus) were gradually acclimated to awake fMRI scanning procedures. Each subject was then scanned for 30-min sessions at 9.4 Tesla. Differences in resting state functional connectivity between males and females were determined using group independent component analysis (ICA) with dual regression; ICA dimensionality was set at 20.
Results: The group ICA identified several discrete networks that are largely bilateral and underly multiple levels of cognitive, reward, motor, and sensory processing. Sex differences were identified in several, but not all, networks (all p's <0.05). Females displayed increased functional connectivity within the most anterior networks compared to males, including areas such as the prefrontal cortex, while males exhibited greater functional connectivity among more dorsal cortical modes (containing anterior or posterior cingulate, occipital, temporal, motor, insula, and somatosensory cortices) and modes that contained subcortical regions (caudate or thalamus).
Conclusions: These results suggest network specific sex differences in the large-scale functional organization of the brains of awake adult squirrel monkeys. Importantly, these baseline differences provide several possible avenues for investigating the underlying neural circuitry that may explain differential vulnerability to the abuse-related effects of drugs between males and females.

Full-Oral Communication I: Epidemiology

Minority Stress Theory and Opioid Use Disorder: The Importance of Gender, Mental Health and Motivations for Use in Sexual Minorities

Matthew Ellis[*1], Zachary Kasper[1], Theodore Cicero[1]*
[1]*Washington University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research
Aim: According to minority stress theory, sexual minorities (SMs) are at greater risk for substance use disorders as a result of avoidant coping behavior. While supported for this pathway exists for tobacco and alcohol use, the purpose of this study was to understand whether differences between SM and non-sexual minority (NSM) opioid users support minority stress as a pathway to opioid use disorder, which has yet to be evaluated.
Methods: Individuals entering treatment for opioid use disorder (OUD) (N=2,467) among 96 sites in 38 states were surveyed in 2018-2020 on sociodemographics, sexual orientation, opioid use patterns, and mental health.
Results: Sexual minority opioid users (n=298) were significantly (p<0.001) more likely than NSMs to be women (78.0% vs. 69.0%), and have histories of psychiatric disorders (68.9% vs. 45.0%), sexual abuse/molestation (71.3% vs. 25.7%), PTSD (53.0% vs. 39.4%), and suicide attempts (54.6% vs. 27.5%), including intentional overdoses (31.5% vs. 18.0%). Sexual minority opioid users were also significantly (p<0.001) more likely to endorse as motivations for persistent opioid use; self-medicating psychological issues (54.6% vs. 40.7%), escaping current life stressors (64.2% vs. 52.1%) and escaping past traumatic events (52.9% vs. 33.8%). Sexual minorities also had increased rates of injection of opioids, polysubstance use, and sexually transmitted infections.
Conclusions: These data suggest that minority stress-associated factors play an important role in the development of OUD among SMs, particularly women. Opioid use served as an escape or coping mechanism for stressors, traumatic events, and mental health, with the concerning outcome that SM suicide attempts, including intentional overdoses, were twice as high as that of NSMs. Opioid treatment and prevention strategies must consider sexual minority stress, mental health and suicide risks as important components of integrated addiction management.

Opioid Use Disorder Prevalence and Treatment Among Transgender People Enrolled in a Specialized New York Medicaid Plan

Jeremy Kidd[*1], Sima Toussi[2], Tse-Hwei Choo[3], Emilia Dwyer[4], Ethan Fusaris[5], Jerry Ernst[5]*

[1]Columbia University, [2]Pfizer, [3]Columbia University Mailman School of Public Health, [4]Express Scripts, [5]Amida Care
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research
Aim: There are no data on opioid use disorder (OUD) among transgender (TG) individuals despite disproportionately high rates of other substance use and lower rates of addiction treatment than cisgender (CIS) individuals. This study examined OUD prevalence and treatment among TG individuals using claims data from Amida Care, a nonprofit Medicaid plan for HIV-positive, TG, and homeless individuals in New York City.
Methods: We included adults with ≥12 months of continuous enrollment in Amida Care between 2017-2019. We identified TG individuals using self-reported gender identity and insurance claims for gender-affirming medical/surgical care. We defined OUD diagnosis as ≥1 inpatient or ≥2 outpatient claims within 24 months for an OUD-related ICD-10-CM diagnostic code. Medication treatment for OUD (MOUD) was operationalized as any claim for methadone maintenance, buprenorphine, or extended-release naltrexone. MOUD was further dichotomized as receiving a continuous 28-day supply.
Results: Of 7412 included Amida Care clients, 861 (11.6%) were TG and 6962 (93.9%) were HIV-positive. TG clients were younger than CIS clients (mean age 33.7 vs 43.3 years, p<.0001). The majority of both TG (88.4%) and CIS clients (73.1%) were non-White. OUD was diagnosed in 25.0% of CIS clients, compared to 9.8% of TG clients (p<.0001). Among individuals with OUD, TG clients were less likely than CIS clients to receive any MOUD (42.9% vs 55.2%; p<.0001) or a 28-day supply of MOUD (3.6% vs. 6.0%, p<.0001).
Conclusions: This is the first study of OUD among TG individuals. Overall, OUD rates among Amida Care clients were much higher than general population estimates (0.7%). While OUD was less prevalent among TG clients, TG clients with OUD were less likely to receive MOUD. This may reflect unique treatment access barriers for TG individuals with OUD. Additional analyses are underway to compare HIV outcomes and other medical/psychiatric comorbidities of TG and CIS Amida Care clients with OUD.

Population-Level Impact of Linkage to Outpatient Pharmacotherapy From Inpatient Medically Managed Withdrawal Programs for People With Opioid Use Disorder, a Simulation Study Using the Respond Model

Alexandra Savinkina[1], Joshua Barocas[1], Jake Morgan[2], Sabrina Assoumou[2], Benjamin Linas[2], Alexander Walley[2], Sean Murphy[3]*
[1]Boston Medical Center, [2]Boston University School of Medicine, [3]Weill Cornell Medical College
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Medications for opioid use disorder (MOUD) are shown to reduce opioid use and risk of overdose. Patients with OUD who exit inpatient medically managed withdrawal programs (detox) without linkage to MOUD have high rates of overdose. While detox encounters provide an opportunity for linkage to MOUD, this transition is not common practice. We used simulation modeling to investigate the potential population-level effects of a policy encouraging MOUD linkage after inpatient detox encounters.
Methods: We employed a compartmental simulation model to evaluate the effect of MOUD linkage after inpatient detox encounters in Massachusetts. We compared status quo care, where no detox patients are linked to outpatient MOUD providers, to a scenario including the following components: 1) offer of linkage to outpatient MOUD to all patients at discharge, 2) 78% acceptance of linkage among patients. Data sources included administrative records, clinical trials, and the published literature. We report reduction in fatal overdose and cost-effectiveness outcomes for the Massachusetts OUD population. Cost-effectiveness from the health-care sector perspective was estimated from a closed cohort simulation of 214,197 over a lifetime horizon. Incremental cost-effectiveness ratios (ICERs) were calculated, with a 3% discounting rate for costs, life-years, and quality-adjusted life years (QALYS). QALYS were estimated using the minimal method.
Results: Linking 78% of all detox patients in Massachusetts to MOUDs prevented 998 fatal overdoses (4.5%), decreased person-time in active opioid use by 2.4%, and increased time on MOUD by 40% over a 10-year period.

In the cost-effectiveness analysis, linkage to MOUD from detox was cost-effective at the $100,000 threshold; the cost-per-life year saved was $52,843, and the cost-per-QALY saved was $46,134.
Conclusions: Our simulation model indicates that MOUD linkage policies among detox patients could substantively prevent fatal opioid overdoses in the OUD population and would be cost-effective from a healthcare sector perspective.

Perceived Driving Ability Under the Influence of Alcohol and Cannabis

Andrew Fares[*1], Christine Wickens[1], Robert Mann[1], Justin Matheson[1], Wright Madison[1], Gina Stoduto[1], Patricia Di Ciano[1], Bruna Brands[2]*
[1]Centre for Addiction and Mental Health, [2]Health Canada
Abstract Detail Human
Select Drug Category Other, Alcohol and Cannabis
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Alcohol and cannabis remain the two most commonly detected drugs in seriously and fatally injured drivers. Furthermore, non-medical users of cannabis commonly report the combined use of alcohol and cannabis. With the increased legalization of non-medical use of cannabis, there is more interest in the effects of combinations of these drugs. The purpose of the present study was to examine the combined effects of alcohol (BrAC of 0.08%) and smoked cannabis (12.5% THC) on the self-reported perception of driving ability as compared to their actual driving ability as measured on a simulator.
Methods: In this within-subjects, double-blind, double-dummy, placebo-controlled, randomized clinical trial, cannabis users (1-7 days/week) aged 19-29 years attended four sessions in which they received: 1) alcohol and placebo cannabis; 2) cannabis and placebo alcohol, 3) active cannabis and active alcohol; or 4) placebo alcohol and placebo cannabis. Perceived driving ability was assessed with a “Driving Ability Question” using a Likert-type scale ranging from 1 (demonstrated poor driving skills) to 5 (demonstrated excellent driving skills) after participants had driven a simulator post-drug administration.
Results: Data presented are from a sample of 28 participants (16 males, mean age 22.5 years). Participants rated their driving ability as significantly worse than placebo when under the influence of alcohol ($p=0.009$), cannabis ($p<0.001$), and both alcohol and cannabis combined ($p=0.001$). However, participants did not rate their driving under the combination of drugs as significantly worse than either drug alone ($p>0.05$). By comparison, simulator data (standard deviation of lateral position) demonstrated greater impairment for the combined condition compared to either drug alone.
Conclusions: While participants are aware of their poorer driving when driving under the influence of alcohol, cannabis and both combined, they seemed unaware of the greater level of impairment under the influence of both cannabis and alcohol combined compared to either alcohol or cannabis alone.

Two Alternative Approaches in Research on Polydrug Combinations: What Caused What?

James Anthony[*1], Olga Vsevolozhskaya[2]*
[1]Michigan State University, [2]University of Kentucky
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: In most experiments, scientists specify drug exposures 1-by-1 or in generally pre-specified combinations. In epidemiological studies, users experience drug exposures 1-by-1 or in combinations, generally not pre-specified. Our aim is to provide and to discuss empirical estimates of multi- and poly-drug effects when users experience these combinations without pre-specification.
Methods: In this four-site NIMH Epidemiologic Catchment Area (ECA) program research, a multi-stage area probability sampling design identified 13,538 United States (US) adult household residents (n~3000/site, both sexes). Consenting participants completed standardized Diagnostic Interview Schedule (DIS) modules with multi-item assessments of DSM alcohol and other drug syndromes. Via analysis-weighted survey estimates for regression model intercepts and slopes, we compare and contrast inferences about polydrug effects of

combinations when users subjectively attribute effects to specific drugs versus an alternative approach that does not require subjective attributions.
Results: When studied as individual subgroups, the 611 cocaine users and the 126 heroin users in the epidemiological sample differed substantially in their DSM symptom experiences (e.g., heroin users roughly three times more likely to experience feelings of dependence, tolerance, and withdrawal; $p<0.05$). Our regression based approach combines the subgroups for new estimates of the how often these DSM syndrome-related experiences occur when cocaine+heroin users are contrasted with cocaine-only and heroin-only users — and when we do not require users to attribute their symptom experiences to one drug versus another drug.
Conclusions: Given increased prominence of polydrug use, we describe an alternative approach for research on drug-related harms. Elsewhere (e.g., studying the lung cancer experience of tobacco smokers who drink alcohol), we do not ask users to tell us whether it was the smoking or the drinking that caused the lung cancer. We suspect that polydrug users might not have definitive knowledge about underlying causal processes when they are asked to attribute addictive effects to one drug versus another.

Tuesday, June 22, 2021

Mini-Oral Communication II: Social Factors

Social Context and MDMA Self-Administration in Male and Female Rats

Karl Schmidt[1], Jessica Sharp[1], Tallia Pearson[1], Kenzie Potter[1], Mark Smith[1]*
[1]*Davidson College*
Abstract Detail Animal Study
Select Drug Category Club/Designer Drugs
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: 3,4-Methylenedioxymethamphetamine (MDMA) is a member of the entactogen class of drugs, producing feelings of oneness, emotional openness, and relatedness. One unique feature of MDMA is that people tend to selectively take this drug in social and/or intimate situations. Although MDMA is recognized as having significant abuse liability in humans, preclinical studies report that it has only weak reinforcing effects and maintains low rates of self-administration in laboratory animals. A significant limitation of these preclinical studies is the need to isolate subjects during testing, a necessary requirement of intravenous drug self-administration studies. We have developed operant-conditioning chambers that permit two rats to self-administer drugs simultaneously, side-by-side, in the same chamber. The objective of this study was to characterize the positive reinforcing effects of MDMA in a translationally relevant model of the social environment in which two rats have simultaneous and contingent access to intravenous MDMA in close physical proximity to one another.
Methods: MDMA self-administration was examined on both fixed ratio (FR1) and progressive ratio (PR) schedules of reinforcement in five groups of rats: (1) isolated males, (2) isolated females, (3) male-male dyads, (4) female-female dyads, and (5) male-female dyads.
Results: MDMA failed to produce positive reinforcing effects under all conditions examined. Across a 30-fold dose range, MDMA did not maintain higher rates of responding than vehicle on both schedules of reinforcement and in all five groups tested.
Conclusions: These data suggest that social contact does not increase the efficacy of MDMA to function as a positive reinforcer in laboratory rats.

Effects of 3,4-Methylenedioxymethamphetamine (MDMA), d-Methamphetamine, Fenfluramine, and D-Amphetamine on Prosocial Behavior in Female Nonhuman Primates

Alison Wakeford[1], Marissa Costa[2], Hannah Alton[2], Stephen Kohut[1]*
[1]*Harvard Medical School McLean Hospital,* [2]*McLean Hospital*
Abstract Detail Animal Study
Select Drug Category Club/Designer Drugs
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Multiple psychiatric illnesses include deficits in social functioning. 3,4-methylenedioxymethamphetamine (MDMA; “ecstasy”) has been shown to produce long-lasting decreases in post-traumatic stress disorder

symptomology and is currently being investigated as a candidate medication. MDMA's therapeutic effects are thought to be related to its mixed dopaminergic (DA) and serotonergic (5HT) pharmacological profile. Nonhuman primates demonstrate valid and translationally relevant social behavioral repertoires that can be used to better understand the relative role of DA and 5HT in MDMA's potential therapeutic effects.
Methods: Here, we examined the capacity of four drugs with ranging selectivity as DA to 5HT releasers to modulate pro-social behavior in four pairs of drug-naïve female squirrel monkeys (n=8). Doses of MDMA (0.1-1.0 mg/kg), fenfluramine (0.1-1.0 mg/kg), d-methamphetamine (MA; 0.03-0.3 mg/kg), d-amphetamine (0.1-1.0 mg/kg) or saline vehicle were administered 10-min prior to observation sessions in which prosocial behavior was scored by a blind observer.
Results: MDMA and the 5HT-selective releaser, fenfluramine, produced dose-dependent increases in affiliative behavior, with the 1.0 mg/kg dose of both drugs eliciting the highest affiliative behavior scores (MDMA=36.9, Fenfluramine=29.8 min). Interestingly, MDMA produced longer durations of proximity behavior (27.5 min) compared to fenfluramine (16.5 min), whereas fenfluramine elicited longer durations of huddling (13.3 min) compared to MDMA (4.5 min). In contrast, the dopamine-preferring releasers MA and d-amphetamine both elicited little affiliative behavior (MA=0.6, d-amphetamine=0.2 min).
Conclusions: The serotonergic component of MDMA appears to contribute to its prosocial effects, and the differences between MDMA and fenfluramine suggest that facets of prosocial behavior may be different based on the serotonergic profile of the drug in question. These data may suggest new directions for medications development aimed at restoring social deficits in psychiatry. Future studies will include male subjects to investigate sex as a biological variable and analysis of other behaviors.

The Effect of Social Recovery Capital and Parental AUD on Drinking Outcomes

Meredith Francis[*1], Vivia McCutcheon[2], Jessica Bourdon[3], Kathleen Bucholz[2]*
[1]Washington University in St. Louis, [2]Washington University School of Medicine, [3]Wellbridge Center for Addiction Treatment and Research
Abstract Detail Human
Select Drug Category Alcohol
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Social Recovery Capital (SRC) has emerged as an important conceptualization of the social factors influencing risk and recovery for Alcohol Use Disorder (AUD). Parental AUD (pAUD), a measure of genetic loading for AUD, has also been identified as an important component of these outcomes. This study aims to fill a research gap by examining the effect of SRC in conjunction with pAUD on current drinking status.
Methods: The sample consisted of individuals at high familial risk of AUD from the Collaborative Study on the Genetics of Alcoholism (N=3100). Logistic regression predicted current drinking status with the Important People and Activities measure recoded to reflect SRC (SRC-IPA) and pAUD status. Current drinking status was dichotomized into "=no or low-risk drinking" and "0=current AUD or high-risk drinking." pAUD was coded as 3=neither has AUD, 2=one has AUD, and 1=both have AUD. pAUD was also examined as a moderating factor for SRC and drinking status.
Results: Each one SD increase in SRC predicted 1.72 higher odds of not developing AUD (B=0.54, p<0.001). Having one (OR 1.33; B=0.28, p<0.01) or no parents with AUD (OR 1.94; B=0.66, p<0.001) was also related to higher odds of not developing AUD compared to having both parents with AUD. For those that did develop AUD (N=845), each one SD increase in SRC is related to 1.53 higher odds of being in remission with no or low-risk drinking (B=0.43, p<0.001). pAUD was not significantly related to remission. pAUD did not moderate the relationship SRC and drinking status for either analysis.
Conclusions: People with higher SRC are significantly more likely to avoid developing AUD and to enter remission, regardless of genetic predisposition. This study found no interaction effect between SRC and pAUD. Further exploration of the mechanisms of this relationship is warranted (e.g., mediation, parental history of recovery).

Mini-Oral Communication II: Immune

Fentanyl Choice in Sprague Dawley Rats is Decreased by Pretreatment With the CC Chemokine Receptor 5 Antagonist Maraviroc

Briana Mason[*1], Robert Seaman[1], Gregory Collins[1]*
[1]The University of Texas Health Science Center at San Antonio
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: There has been a significant effort to develop novel pharmacotherapies that treat opioid use disorders in the past few decades. Although much of this work has focused on drugs targeting opioid receptors (i.e., mu, kappa, and delta subtypes), new research has implicated inflammation-related receptors, such as the chemokine receptor CC Chemokine Receptor 5 (CCR5), in opioid use disorders. This study aimed to determine whether a CCR5 antagonist (Maraviroc) could significantly reduce opioid-taking using a multiple component drug versus food choice procedure.
Methods: Under the choice procedure, adult male Sprague Dawley rats (n=8) responded under a fixed ratio (FR) 5 on one lever to receive food (grain-based pellet) or under an FR5 on the alternate lever for infusions of fentanyl. Food was available across all 5 components, whereas the unit dose of fentanyl (0.32-10 µg/kg/infusion) increased across components 2-5; component 1 served as a no drug control. Once responding stabilized, with exclusive choice of food observed in component 1, and exclusive choice of fentanyl in component 5, rats were pretreated with Maraviroc (3.2-10 mg/kg), a mu-opioid receptor antagonist, naloxone (1 and 3.2 mg/kg; positive control), or a dopamine D2-like receptor antagonist, haloperidol (0.1 and 0.32 mg/kg; negative control).
Results: Pretreatment with naloxone shifted responding away from fentanyl and towards food, whereas pretreatment with haloperidol failed to affect choice behavior at doses that did not also reduce the number of trials completed. Similarly to naloxone, Maraviroc resulted in a dose-dependent reallocation of behavior away from fentanyl and towards food while also increasing the number of trials completed.
Conclusions: Treatment with a CCR5 antagonist dose dependently, and selectively reduced the reinforcing effects of fentanyl in rats, suggesting that it might be viable treatment for opioid use disorder. Future studies will determine the effects of Maraviroc persist upon chronic treatment in our paradigm.

Association Between Electronic and Combusted Cigarette Use and Biomarkers of Systemic Inflammation Among U.S. Adults

Emeka Okafor[*1], Karla Bautista[1], Ijeoma Opara[2]*
[1]Baylor University, [2]Stonybrook State University
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Epidemiology
Abstract Category Original Research
Aim: To examine the associations of self-reported cigarette use status (including electronic-cigarette use, combustible cigarette use only, and dual use of both products) with biomarkers of systemic inflammation (hs-CRP, interleukin-6 (IL-6)), fibrinogen, and soluble intercellular adhesion molecule (sICAM).
Methods: Data came from Wave 1 (2013-2014) of the Population Assessment of Tobacco and Health (PATH) study Biomarker Restricted-Use files. Of the 7,159 adults who provided a blood specimen, we excluded respondents who reported that a doctor or health professional had told them that they had cancer or any heart disease (N=1,796) and those who were never tobacco product users (N=1,674), for an analysis sample of 3,689. We used multiple linear regression models to cross-sectionally determine analysis of cigarette use status with log-transformed hs-CRP, IL-6, fibrinogen, and sICAM adjusting for relevant confounders
Results: Median age was 38; IQR=27, 50), majority of whom were male (60%), and non-Hispanic White (65%). After adjustment for the full set of covariates, e-cigarette use was associated with lower levels of hs-CRP (B=-0.41, 95% CI:-0.62, -0.21), IL-6 (B=-0.17, -0.30, -0.05), fibrinogen (B=-0.06, -0.11, -0.01) and sICAM (B=-0.17, -0.25, -0.08) compared to combusted cigarette use, with precise confidence intervals around the beta estimate that excluded the null value. Dual use of both products was also associated with lower levels of most biomarkers of inflammation compared to combusted cigarette use.
Conclusions: In this nationally representative analysis of data from adults in the U.S., we found that respondents who self-reported exclusively using electronic cigarettes had lower levels of four biomarkers of systemic inflammation compared to combusted cigarette users. Individuals who reported using both e-cigarettes and

combusted cigarettes were at lower levels of biomarkers of systemic inflammation compared to individuals who reported exclusive combusted cigarette use.

Impact of Alcohol Use Disorder Severity on HIV Viral Suppression and CD4 Count in Three International Cohorts of People Living With HIV

Nicolas Bertholet[*1], Richard Saitz[2], Judith A. Hahn[3], Nneka I. Emenyonu[3], Matthew Freiberg[4], Michael R. Winter[2], Timothy Heeren[2], Kara Magane[2], Alexandra Chretien[2], Christine Lloyd-Travaglini[5], Robin Fatch[3], Leah Forman[2], Lindsey Rateau[2], Elena Blokhina[6], Winnie R. Muyindike[7], Natalia Gnatienko[5], Jeffrey Samet[5]*
[1]Lausanne University Hospital, [2]Boston University School of Public Health, [3]University of California San Francisco, [4]Vanderbilt University Medical Center, [5]Boston University School of Medicine, [6]First Pavlov State Medical University, [7]Mbarara University of Science and Technology

Abstract Detail Human
Select Drug Category Alcohol
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research

Aim: Alcohol use has been linked to HIV outcomes through biological effects or effects on antiretroviral medication adherence, but few have explored the effects of alcohol use disorder (AUD) on outcomes. This study assessed the cross-sectional associations between AUD severity and HIV viral suppression and CD4 count in the cohorts of the Uganda Russia Boston Alcohol Network for Alcohol Research Collaboration on HIV/AIDS (URBAN ARCH).
Methods: People living with HIV (PLWH) from Uganda (n=301), Russia (n=400) and Boston (n=251) were included. Logistic and linear regressions were used to assess the associations between AUD severity (number of DSM 5 criteria) and HIV viral suppression and CD4 count, adjusting for sex, age, marital status, education level, employment, current use of opioids, cannabis, stimulant and tobacco.
Results: Proportion of females was 51% (Uganda), 34% (Russia) and 33% (Boston); mean age (SD) was 40.7(9.6), 38.6(6.3) and 52.1(10.5) respectively. All but 27.3% in Russia and 5.2% in Boston were on ART. Mean number of AUD criteria was 1.6(2.4) in Uganda, 5.6(3.3) in Russia and 2.4(3.1) in Boston. Viral suppression was achieved in 92% of the sample in Uganda, 57% in Russia and 87% in Boston; median (IQR) CD4 count was 673(506;866), 351(201;542) and 591(387;881) respectively. In adjusted models, there was no cross-sectional association between AUD severity and HIV viral suppression: OR (95%CI) per 1 additional AUD criteria in Uganda 1.08(0.87;1.33); Russia 0.98(0.92;1.04); Boston 0.95(0.84;1.08) or CD4 count: beta (95%CI) per 1 additional criteria: 5.78(-7.47;19.03), -3.23(-10.91;4.44) and -8.18(-24.72;8.35) respectively.
Conclusions: In three cohorts of PLWH, we did not find an association between AUD severity and HIV viral suppression or CD4 count. PLWH and AUD can achieve virologic control and AUD does not appear to be associated with HIV viral suppression and CD4 count.

Mini-Oral Communication II: Personalized Medicine

OPRM1 Significantly Related to Positive Subjective Effects of Opioids in Subjects Without Prior Opioid Abuse: A Within-Subjects Human Laboratory Study

Kelly Dunn[*1], Andrew Huhn[1], Brion Maher[2], Patrick Finan[3], Cecilia Bergeria[1], Matthew Johnson[1], Gary Wand[1], George Bigelow[1], Eric Strain[1], Denis Antoine[1]*
[1]Johns Hopkins University School of Medicine, [2]Johns Hopkins Bloomberg School of Public Health, [3]Johns Hopkins Hospital

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Genetics/Proteomics/Metabalomics
Abstract Category Original Research

Aim: This study evaluated the contribution of the OPRM1 gene and A118G SNP, and other exploratory genes, to the abuse potential of opioids to inform identification of an opioid abuse-risk phenotype and genotype.
Methods: 100 healthy adults (50% women) with no history of opioid misuse completed a 5-day, within-subject, inpatient study wherein they received double-blinded oral doses of placebo, and 2mg, 4mg, and 8mg of hydromorphone. Primary outcomes were measures of abuse potential and subjective effects. Outcomes were collapsed across active doses to establish an “abuse-risk” phenotype and consisted of dichotomized ratings of

visual analog scales (VAS) for HIGH and GOOD EFFECTS (>60 on the respective scale for active dose), being an Opioid Responder (a 20-point difference between baseline and active drug on Drug Effect VAS), Enjoying the Drug, and Willingness to Take Again. Blood samples were genotyped with the Global Screening Array GWAS and the association of the OPRM1 gene/A118G SNP, and exploratory genes, on outcomes were analyzed using logistic regressions.
Results: SNPs in OPRM1 were significantly associated with ratings of HIGH >60 (p=0.04), Take Again (p=0.03), Enjoying the Drug (p=0.04), and being an opioid responder (p=0.02). The A118GSNP minor allele had low representation and only approached (p=0.06) significance. Exploratory analysis revealed SNPs on the CLOCK gene were strongly associated with HIGH >60 (p=.0004) and several additional genes showed significant associations. Participant sex did not reliably impact outcomes.
Conclusions: Data suggest that differences in subjective experience of opioids may be partially driven by OPRM1 and OPRM1 may contribute to individual differences in risk for problematic opioid use. This is the first study of this type to be conducted among persons with no preexisting history of problematic opioid use, and these data can inform and advance efforts to prevent development of opioid use disorder, particularly among persons receiving opioid prescriptions.

Analyses of the Intron 2 OPRK1 Receptor Polymorphisms in Association With Opioid and Cocaine Dependences in African American Population

Eduardo Butelman[*1], Vadim Yuferov[1], Matthew Randesi[1], Jurg Ott[1], Mary Jeanne Kreek[1]*
[1]The Rockefeller University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Genetics/Proteomics/Metabalomics
Abstract Category Original Research
Aim: Recent In vitro assays showed that the OPRK1 intron 2 may function as a genomic enhancer in the regulation KOR expression and contains a dexamethasone-responsive sequence site (Lutz et al, 2018). The aim of the study is whether SNPs in the intron 2 of OPRK1 are associated with categorical opioid or cocaine dependence diagnoses, as well as with dimensional aspects of drug use (including dimensional measures of drug exposure, with KMSK scales).
Methods: The current study includes 577 subjects ≥18 years old of both gender, with African ancestry (AA) from the USA. They were divided into three groups: 152 control subjects, 142 persons with lifetime opioid dependence diagnosis (OD), and 283 subjects with lifetime cocaine dependence diagnosis (CD). Five SNPs (rs16918909, rs7016778, rs997917, rs6473797, rs10111937) in intron 2 of the OPRK1 were used for the association analyses. Association analyses for OD and CD diagnoses and the OPRK1 intron 2 alleles were carried out with Fisher's exact test. The Kreek-McHugh-Schluger-Kellogg (KMSK) scales were used for dimensional measure of maximum exposure to specific drugs, using Mann-Whitney tests.
Results: Two SNPs, rs997917 and rs10111937 showed nominally significant allelic association ($p < 0.05$) with cocaine dependence, and rs10111937 showed a point-wise significance in association with opioid dependence only. The genotype pattern of rs7016778 and rs10111937 was found to be significantly associated with development of cocaine dependence (p=0.013, odds ratio=2.24). Another genotype pattern of rs16918909 and rs10111937 was found to be associated with heroin dependence (p=0.011, odds ratio=4.62). Dimensional analyses with KMSK scores show that persons with either rs997917 or rs10111937 variants had greater exposure to cocaine, compared to those with prototype allele (Mann-Whitney tests).
Conclusions: The results of this study provide an additional support of functionality of the intron 2 OPRK1 in development of heroin and cocaine dependence in African Americans and should be studied further.

Corticotropin Releasing Hormone Receptor 1 (CRHR1) Genetic Variation Associated With Cocaine Use Pattern and Problem Severity Among Regular Cocaine Users

Mark Greenwald[*1], Tabitha Moses[2], Margit Burmeister[3]*
[1]Wayne State University, [2]Wayne State University School of Medicine, [3]University of Michigan
Abstract Detail Human
Select Drug Category Stimulants
Topic Genetics/Proteomics/Metabalomics
Abstract Category Original Research

Aim: Corticotropin releasing hormone acting at its type-1 receptor (CRHR1) modulates cocaine self-administration (particularly stress-induced reinstatement) in animal models. The present study examined associations of two CRHR1 genetic variants with cocaine-use pattern and problem severity among regular cocaine users.
Methods: Sixty-two individuals with cocaine use disorder screened for a non-treatment laboratory study were genotyped for CRHR1 intron variants rs242924 and rs173365. Participants were phenotyped for lifetime and recent substance-use patterns (2-week timeline followback [TLFB], Cocaine Purchasing and Use Patterns [CPUP], urinalysis), problem severity (Cocaine Selective Severity Assessment [CSSA], number of lifetime cocaine quit-attempts and adverse consequences), trait impulsivity (Barratt Impulsiveness Scale [BIS-11]) and mood (Beck Depression Inventory [BDI-II], State-Trait Anxiety Inventory [STAI]).
Results: rs242924 allelic variation (A/A homozygotes, n=40; C-allele carriers, n=20) was not significantly related to self-identified race (49 black, 11 white, 2 other) or sex (49 male, 13 female). Relative to C-allele carriers, A/A homozygotes reported significantly ($p<.05$) higher mean cocaine "binge ratio" scores (TLFB, defined as: number of $10 units used ÷ number of cocaine-use days; 6.38 vs. 3.70) and mean daily cocaine use across the prior 2 weeks ($30.98 vs. $18.17). rs242924 A/A homozygotes reported significantly higher cocaine severity scores (CSSA total: 24.9 vs. 15.1), problem severity rating (2.60 vs. 1.95 [0-3 scale]) and ever having sought cocaine treatment (75% vs. 46%); and significantly higher scores on the BDI-II (15.5 vs. 9.8) and BIS-11 cognitive instability subscale (5.58 vs. 4.64). rs173365 (C/C [n=17], T/C [n=23] and T/T [n=22]) genotypes did not significantly differ on these phenotypes, although rs242924 and rs173365 were in moderately high linkage disequilibrium.
Conclusions: CRHR1 rs242924 variation was related to cocaine use pattern and problem severity among these non-treatment seekers with cocaine use disorder. Further research should confirm these preliminary associations and explore potential clinical significance.

Full-Oral Communication II: Drug Discovery

Cannabinoid-Like Effects of 5F-MDMB-PICA and its 5F-N-Pentylindole Analogs in Mice

Grant Glatfelter[*1], John Partilla[1], Michael Baumann[1]*
[1]NIDA Intramural Research Program
Abstract Detail Animal Study
Select Drug Category Club/Designer Drugs
Topic Pharmacology
Abstract Category Original Research
Aim: 5F-MDMB-PICA is an abused synthetic cannabinoid receptor agonist (SCRA) with unclear in vitro potency at cannabinoid-1 receptors (CB1) and little information regarding its in vivo pharmacology. The current study aimed 1) to compare in vitro and 2) in vivo CB1 potency and efficacy of 5F-MDMB-PICA and 5F-N-pentylindole structural analogs with head group variations. We also sought 3) to understand whether data from in vitro CB1 assays in mouse brain tissue can predict in vivo potency for cannabinoid-like effects in this species.
Methods: CB1 potencies in vitro were determined in competition binding and efficacy assays using mouse brain membranes. In vivo cannabinoid-like effects on temperature, catalepsy, and analgesia were measured every 30 min for 2 h post SCRA administration (0.001–30 mg/kg s.c.) in male C57BL/6J mice and were evaluated via two-way ANOVA (treatment x time; n = 7 – 9 mice per dose) for each SCRA. Effects of rimonabant pretreatment (0.1 & 1 mg/kg s.c.) were evaluated via one-way ANOVA (n = 5 – 6 per treatment). Potency values (IC50, EC50, and ED50) were determined using non-linear regression analyses.
Results: 5F-MDMB-PICA dose-dependently inhibited [3H]SR141716 binding (IC50 = 2.34 nM) and displayed agonist efficacy in [35S]GTPγS assays (EC50 = 1.46 nM). In vivo, 5F-MDMB-PICA produced dose- (ED50 values = 0.02 – 0.03 mg/kg s.c.) and time-dependent effects ($p < 0.05$) on temperature, catalepsy, and analgesia that were reversed by rimonabant ($p < 0.05$), suggesting involvement of CB1. Head group composition of 5F-N-pentylidnole structural analogs influenced potency across assays. In vitro IC50 and EC50 values were highly correlated with in vivo ED50 potencies ($r = 0.99 – 1.00$; $p < 0.05$).
Conclusions: Overall, this study demonstrates that 5F-MDMB-PICA is a potent SCRA, head group composition affects activity of 5F-N-pentylindoles, and CB1 potencies of SCRAs in mouse brain tissue are predictive of in vivo potencies in mice.

Pharmacological Characterization of Corynantheidine, a Minor Alkaloid in Mitragyna Speciosa (Kratom), at the μ-Opioid and α2-Adrenergic Receptors

Morgan Crowley[1], Samuel Obeng[2], Francisco Leon[3], Avi Patel[2], Luis Restrepo[2], Lea Gamez Jimenez[2], Nicholas P. Ho[2], Marco Mottinelli[3], Christopher McCurdy[3], Lance McMahon[2], Takato Hiranita[2]*
[1]University of Florida, [2]University of Florida, Department of Pharmacodynamics, [3]University of Florida, Department of Medicinal Chemistry

Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Pharmacology
Abstract Category Original Research

Aim: To characterize the pharmacology of a minor Mitragyna Speciosa alkaloid, corynantheidine, at opioid and adrenergic-α2 receptor (Aα2R).
Methods: Male/female adult Sprague-Dawley rats. Hot-plate latency (52°C, 60-sec cutoff). Lever responding was shaped under a fixed-ratio 10 schedule of food delivery. Immediately following an i.p. injection of morphine sulfate (3.2 mg/kg, i.p.), or vehicle, each rat was placed in a 2-lever operant conditioning chamber. Under the training conditions, only correct responses were reinforced with food delivery, i.e., left lever after morphine or right lever after vehicle. During tests, responses on both levers were reinforced. 2-way repeated-measures ANOVA (sex, dose)
Results: Affinities (Kis) of corynantheidine at human μ-, κ-, δ-opioid, α2A-, and α2C-adrenergic receptors were 448 ([3H]DAMGO), 5,550 ([3H]U69,593), 2,790 ([3H]DADLE), 351 ([3H]RX821002), and 135 nM ([3H]RX821002), respectively. The maximum stimulation (normalized to DAMGO) of corynantheidine was 3% (up to 10 μM); at 10 times their respective Kis, corynantheidine (4,480 nM) and the opioid antagonist naltrexone (18.4 nM) shifted the concentration-effect curve of DAMGO 4.3-fold and 81-fold to the right, respectively. In rats, corynantheidine produced robust (100% maximum possible effect) hotplate (52°C) antinociception (i.v. cumulative ED50=17.9 mg/kg) and 1.8°C hypothermia at 32 mg/kg; a dose of naltrexone (0.1 mg/kg, i.v.) that antagonized the effects of morphine did not antagonize the effects of corynantheidine. The pattern of in vivo pharmacology of corynantheidine was similar to that of the A2AR agonist lofexidine, which was studied as a comparator A2AR agonist, but not of morphine. In rats discriminating morphine (3.2 mg/kg, i.p.) from vehicle, corynantheidine (5.6-56 mg/kg, i.p.) produced up to 26% drug-lever responding. Corynantheidine (17.8 mg/kg) did not significantly antagonize morphine discrimination.
Conclusions: Despite submicromolar affinity of corynantheidine for A-2AR subtypes and MOR, its effects were not antagonized by naltrexone, suggesting the involvement of A-2AR types in the effects of corynantheidine.

The CB1 Positive Allosteric Modulator, ZCZ011, Attenuates Naloxone-Precipitated Withdrawal Signs in Oxycodone-Dependent Mice

Julien Dodu[1], Rebecca Moncayo[1], Joel Schlosburg[1], Imad Damaj[1], Dai Lu[2], Debra Kendall[3], Aron Lichtman[1]*
[1]Virginia Commonwealth University, [2]Texas A&M University, [3]University of Connecticut

Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Determine whether the CB1 positive allosteric modulator (PAM), ZCZ011, ameliorates naloxone-precipitated withdrawal signs in a mouse model of oxycodone dependence.
Methods: Male and female ICR (or CB1 wildtype/knockout) mice received two daily subcutaneous (s.c.) injections of escalating oxycodone (or repeated saline) for eight days. On day 9, mice received final oxycodone (or saline) injection followed by 1 mg/kg naloxone (s.c.) 2 h later and recorded for 30 min. Bodyweight was recorded before and after naloxone. Recorded videos were scored for jumps, paw flutters, head shakes, and diarrhea by a trained observer blinded to treatment. The ZCZ011 dose-response study administered an acute intraperitoneal (i.p.) injection of 5-40 mg/kg ZCZ011 75 min prior to naloxone. To determine whether cannabinoid receptors mediate the anti-withdrawal effects of 40 mg/kg ZCZ011, complementary genetic and pharmacological (i.e., CB1 inverse agonist/antagonist, rimonabant, and CB2 antagonist, SR144528 given i.p. 85 min prior to naloxone) approaches were used. Fisher's exact test was used to assess diarrhea. One-way ANOVA with Dunnett's post hoc was used to assess dose-response experiment and two-way ANOVA with Tukey's post hoc was used for studies determining cannabinoid receptor involvement. The sample size was sixteen mice per group.

Results: Mice pre-treated with 40 mg/kg ZCZ011 (i.e., 3 of 16 mice) showed reduced diarrhea compared with control mice (i.e., 15 of 16 mice). Additionally, one-way ANOVA main effects were observed for bodyweight loss, paw flutters, and head shakes. ZCZ011 fully attenuated weight loss, whereas head shakes and paw flutters were reduced by half. ZCZ011 did not affect jumping behavior. Pharmacological and genetic studies corroborated to reveal ZCZ011's attenuation of withdrawal signs were mediated through CB1, not CB2, receptors.
Conclusions: These studies indicate the CB1 PAM, ZCZ011, reduces a subset of naloxone-precipitated withdrawal signs in oxycodone-dependent mice and may offer an alternative strategy to target CB1 receptors to treat opioid dependence.

Antinociceptive and Respiratory Depressant Effects of Biased Mu Opioid Agonists in Nonhuman Primates

Carol Paronis[*1], Eric Bow[2], Eugene Gutman[2], Hudson Roth[2], Dana Chambers[2], Joshua Lutz[2], Agnieszka Sulima[2], Sophia Kaska[3], Thomas Prisinzano[3], Arthur Jacobson[4], Kenner Rice[2], Jack Bergman[1]*
[1]McLean Hospital, Harvard Medical School, [2]National Institute of Drug Abuse, [3]University of Kentucky, [4]National Institutes of Health
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Pharmacology
Abstract Category Original Research
Aim: Biased signaling by mu-opioid agonists has been proposed to result in few opioid side effects and, consequently, an improved safety profile compared to conventional prescription opioids. We evaluated the acute effects of novel G-protein preferring opioid agonists in assays of antinociception, operant performance and respiratory function in nonhuman primates.
Methods: Signaling bias of 7 novel compounds was calculated relative to DAMGO using commercially available kits (HitHunter for cAMP accumulation and PathHunter for β-arrestin recruitment). Next, 3 to 5-point dose-effect functions for all seven compounds and morphine were determined in squirrel monkeys (n=3-5/group) using cumulative dosing procedures in two assays. In one set of studies, tail-withdrawal latency from 52oC water (antinociception) and effects on food-maintained operant responding (behavioral disruption) were concurrently evaluated. In other studies, whole body plethysmography in the presence of normal air and air mixed with 5% CO2 was used to obtain respiratory parameters (breathing frequency, tidal volume, minute volume).
Results: All compounds inhibited forskolin-stimulated cAMP accumulation via human μ-opioid receptors, with IC50 values ranging from 0.1 to 12 nM and maximum effects ranging from 26% to 100% of the maximum effects of DAMGO. All compounds had negligible effects recruiting β-arrestin, confirming their designation as G-protein biased agonists. Effects in vivo were more variable across compounds. Morphine, PT-1-111 and EWB-3-14 increased tail-withdrawal latencies, decreased operant response rates and preferentially decreased CO2-stimulated increases in ventilation relative to effects in room air; ongoing studies suggest similar results with EG-2-189 and EG-1-203. Three compounds, EWB-3-27, EG-1-100, and EG-1-199, up to 3.2 mg/kg, increased tail withdrawal latencies to ~50% of the maximum possible effect and decreased response rates but did not alter CO2-stimulated ventilation.
Conclusions: These data demonstrate that the absence of β-arrestin recruitment by mu-opioid agonists is not necessarily associated with reduced respiratory depression in nonhuman primates.

Typical and Atypical Kappa Opioid Agonists Reduce Cocaine and Oxycodone Choice in a Drug vs. Food Self-Administration Model in Male Rhesus Monkeys

Carlos Zamarripa[*1], Sally Huskinson[1], Drew Townsend[2], Thomas Prisinzano[3], Bruce Blough[4], James Rowlett[1], Kevin Freeman[1]*
[1]University of Mississippi Medical Center, [2]Virginia Commonwealth University, [3]University of Kentucky, [4]RTI International
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Combinations of mu and kappa opioid receptor (KOR) agonists have been proposed as potential analgesic formulations with reduced abuse liability. The aim of the present study was to quantitatively compare the

punishing effects of the KOR agonists, salvinorin A, nalfurafine, and triazole 1.1 on a concurrent drug-versus-food choice self-administration procedure.
Methods: Adult male rhesus monkeys (N=5) were trained to respond under a concurrent schedule of food delivery and intravenous cocaine injections (0.018 mg/kg/injection; fixed-ratio 10 schedule of reinforcement) during daily sessions. Once trained, cocaine (0.018 mg/kg/injection) or oxycodone (0.0056 mg/kg/inj) was tested alone or as a combination via co-administration in a second lumen of the catheter with saline, salvinorin A (0.1-3.2 µg/kg/injection), or nalfurafine (0.003-0.1 µg/kg/injection) using a procedure in which the KOR agonists doses were increased across discrete components of choice trials. In addition, the KOR agonist triazole 1.1. (0.0032-0.1 mg/kg/injection) was tested in combination with oxycodone. All conditions were tested in irregular order across subjects. Dose-effect functions were determined daily until choice behavior met selected conditions for stability.
Results: Both cocaine and oxycodone were generally selected over food across all components when administered alone or with the KOR agonist vehicles. For both the cocaine and oxycodone conditions, all KOR agonists decreased drug choice in a dose-dependent manner. Salvinorin A and triazole 1.1, decreased drug choice without altering total trials completed across components (i.e., choice shifted to food at the higher KOR agonist doses). However, increases in nalfurafine dose decreased total choice trials completed, suggesting the presence of nonspecific effects on behavior.
Conclusions: Conclusion: These results suggest that KOR agonists do not uniformly produce selective punishing effects on drug choice. Moreover, the difference cannot be accounted for by an atypical signaling profile because the atypical KOR agonist, triazole 1.1, functioned as a selective punisher.

Mini-Oral Communication II: Nicotine

Biological Markers of Cigarette Smoke Exposure by Sex and Sexual identity: Results From a National Study

Rebecca Evans-Polce[*1], Danielle Smith[2], Carol Boyd[3], Sean McCabe[3]*
[1]University of Michigan, [2]Roswell Park Comprehensive Cancer Center, [3]University of Michigan School of Nursing

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Disparities
Abstract Category Original Research
Aim: Sexual minorities suffer from significantly greater prevalence of tobacco use and tobacco use disorder compared to heterosexual individuals; these differences vary by sex. We examined whether differences in prevalence translates to differential nicotine and toxicant exposure.
Methods: This study used interview and biomarker data from wave 1 of the Population Assessment of Tobacco and Health (PATH) study (2013-14; n=11,522). Analyses were limited to exclusive current established cigarette smokers (i.e., has smoked more than 100 cigarettes in lifetime, currently smokes every day or some days, and does not currently use other tobacco/nicotine products; n=2,412). We examined exposure to urinary cotinine (biomarker of nicotine) and NNAL (biomarker of tobacco-specific nitrosamine NNK, both expressed as ng/mg creatinine). Multivariable regression modelling and appropriate survey weights were used to examine associations of sexual identity with biomarker concentrations for males and female adults separately.
Results: In multivariable regression analyses, gay male adults had significantly higher cotinine levels compared to heterosexual male adults (geometric mean ratio[GMR] = 1.99 [95% CI:1.42, 2.80]) and significantly higher levels of NNAL (GMR = 1.56 [95% CI: 1.01, 2.42]), after adjusting for age, race, ethnicity, region, urbancity, cannabis use, and self-reported cigarettes smoked. In addition, gay/lesbian females had significantly higher levels of NNAL compared to heterosexual females (GMR = 1.48 [95% CI: 1.05, 2.10]). No other significant differences by sexual orientation were found.
Conclusions: Gay male adult cigarette smokers exhibited higher concentrations of urinary cotinine and NNAL, which is suggestive of more frequent and/or intense cigarette smoking behaviors among this group. Future research is needed to examine whether differences in patterns and the context of tobacco use by sexual orientation

explain these differences in nicotine and tobacco toxicant exposure. Our findings have important implications for potential disparate long-term tobacco-related health outcomes among sexual minorities.

Additive Effects of Chronic Tobacco Smoking and HIV-Infection on Brain Volume and Cognitive Abnormalities

Huajun Liang[*1], Thomas Ernst[2], Eric Cunningham[3], Linda Chang[3]*
[1]University of Maryland, [2]University of Hawaii and Queen's Medical Center, [3]University of Maryland School of Medicine

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research

Aim: Tobacco smoking remains prevalent and was linked to poor HIV treatment outcomes, cognitive deficits and greater white matter abnormalities in people with HIV-infection (PWH). Whether tobacco smoking and HIV infection have additive deleterious effects on brain volumes or cortical thickness is unknown and were evaluated.
Methods: Using a 2 × 2 design, 101 HIV seropositive (HIV+, 56 nonsmokers, 45 smokers) and 171 seronegative (SN, 106 nonsmokers, 65 smokers) participants were assessed with brain T1-weighted imaging using automated morphometry (FreeSurfer) and cognitive assessments (7 neuropsychological domains). Independent and interactive effects of HIV and smoking were evaluated with two-way analysis of co-variance (ANCOVA) on cognitive domain Z-scores, selected regions of interest (ROIs) in the subcortical volumes, whole brain voxel-wise cortical volumes and thickness, and white matter (WM) volumes.
Results: Compared to SN, HIV+ had smaller basal ganglia, thalamus, subcortical and cerebral WM volumes (p=0.042-0.002), and poorer attention/working memory, learning, and global function (p=0.004-0.022). Compared to nonsmokers, smokers had smaller hippocampi (-2.87%, p=0.023). HIV and smoking showed opposite effects on volumes in right caudal-middle-frontal (p=0.017) and lateral-occipital (p=0.014) gyri, but additive effects on the smaller thalamus, putamen, pallidum, hippocampus, subcortical GM, and cerebral WM, compared to SN-non-smokers. Compared to SN, HIV had steeper age-related volume declines in the left inferior-parietal (p=0.003) and right superior-frontal (p<0.001) gyri. Smaller volumes typically predicted poorer cognitive performance. Greater immunosuppression or greater tobacco smoking predicted smaller brain volumes in both subcortical and cortical area, especially in HIV+ smokers.
Conclusions: Tobacco smoking and HIV infection appear to have additive negative effects primarily on subcortical and cerebral white matter volumes, suggesting greater neuronal damage or myelin loss in these regions, which may contribute to the lowest cognitive performance seem in smoking PWH across the four participant groups. These findings suggest that tobacco smoking increases risk of HIV-associated neurocognitive disorders.

Examining the Effect of Very Low Nicotine Content Cigarettes on Weight Among Smokers With Psychiatric Conditions or Socioeconomic Disadvantage

Roxanne Harfmann[*1], Sarah Heil[1], Janice Bunn[1], Jennifer Tidey[2], Morgan Snell[2], Danielle Davis[3], Joanna Streck[4], Cecilia Bergeria[5], Maria Parker[6], Stacey Sigmon[1], Diann Gaalema[1], Dustin Lee[5], John Hughes[1], Catherine Markesich[1], Eva Orr[1], Stephen Higgins[1]*
[1]University of Vermont, [2]Brown University, [3]Yale University School of Medicine, [4]Massachusetts General Hospital/Harvard Medical School, [5]Johns Hopkins University School of Medicine, [6]Indiana University

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Policy
Abstract Category Original Research

Aim: There is a reliable pharmacological effect of nicotine on weight, such that reductions in nicotine exposure lead to weight gain. Weight gain may be an unintended consequence of a national nicotine reduction policy. To our knowledge, only one study has examined the relationship between very low nicotine content cigarettes (VLNCs) and weight gain; in this study with general population smokers, the effect was observed in those biochemically verified as adherent to VLNCs (0.4mg nicotine/g tobacco). The aim of this study is to examine associations between VLNCs and weight among vulnerable populations.

Methods: This is a secondary analysis of a double-blind, randomized clinical trial evaluating the effects of VLNCs among individuals (n=775) from three vulnerable populations: smokers with affective disorders (n=258), opioid use disorder (n=260), or socioeconomically disadvantaged women (n=257). Participants were assigned to smoke one of three research cigarettes (15.8, 2.4, 0.4mg/g) over a 12-week period in lieu of their usual brand cigarettes. Weight changes were examined over time by cigarette condition and by compliance status (among those assigned to the 0.4mg/g cigarette) using linear mixed models. Smokers were dichotomized by compliance status as defined by being above or below a previously verified threshold in urine cotinine (<2.69 nmol/mL) at weeks 6 and 12. Statistical significance was set at p<.05.
Results: Overall, participants gained an average of 2.03lbs during the study. There were no differences in weight change over time between cigarette conditions (p=.50). Additionally, compliance to the 0.4mg/g cigarette was not associated with weight change over time (p=0.48).
Conclusions: VLNC assignment was not associated with weight gain among vulnerable populations. Moreover, we did not observe an association between compliance to the 0.4mg/g cigarette and weight gain over time. Given the robust relationship between nicotine and weight, additional analyses to better understand VLNCs and weight in vulnerable populations are needed.

Mini-Oral Communication II: Cannabinoid

Oral Delta-9-Tetrahydrocannabinol Impairs Sustained Attention as Evaluated in the Rodent Psychomotor Vigilance Test

Catherine Moore[1], Catherine Davis[2], Elise Weerts[1]*
[1]Johns Hopkins University School of Medicine, [2]Uniformed Services University of the Health Sciences
Abstract Detail Animal Study
Select Drug Category Cannabis/Cannabinoids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: The rodent Psychomotor Vigilance Test (rPVT) is a preclinical assay designed to track the same performance variables as the human PVT, which is commonly utilized as an objective risk assessment tool to quantify basic attention and neurocognitive function in laboratory, clinical, and operational settings. In the rPVT, rats are required to monitor the location of a light stimulus that appears infrequently and to respond as quickly as possible to the onset of the light stimulus by depressing a nose-poke key; food reinforcement is earned for correct responses. Outcome measures including motor speed, inhibitory control ("impulsivity"), and attention/inattention are used to assess drug effects on vigilance performance. Our hypothesis was that oral delta-9-tetrahydrocannabinol (THC) would impair performance in the rPVT in a dose related manner.
Methods: In an ongoing study, male and female Sprague-Dawley rats were trained to perform the rPVT to the acquisition criteria (75% correct responses and <25% premature responses). To date, five rats (N=5) have received five doses of oral THC in sesame oil (1-17.6 mg/kg) 90 minutes prior to rPVT sessions, administered in a within-subject randomized design.
Results: Analysis of data using a mixed model with dose and intervals as repeated measures revealed that THC produced significant decreases in accuracy ($p<0.05$) and more lapses in responding ($p<0.01$) at higher doses (10-17.6 mg/kg). These impairments were more pronounced at longer stimulus intervals. THC tended to prolong the slowest reaction times (90th percentile), while median reaction times were unaffected.
Conclusions: THC produced impairments in sustained attention and vigilance performance in the rPVT. The rPVT is an innovative translational platform for exploring the neurobehavioral bases of impairments in attention associated with THC and other cannabis constituents.

Prefrontal Cortical Functional Near Infrared Spectroscopy Measures During Working Memory Load Can Detect and Classify Individuals as Impaired From Oral Delta 9-Tetrahydrocannabinol (THC)

Jodi Gilman[1], William Schmitt[1], Sarah Hickey[1], Grace Wheeler[1], Kevin Potter[1], Brian Kendzior[1], Gladys Pachas[1], A. Eden Evins[1]*
[1]Massachusetts General Hospital-Psychiatry
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids

Topic Imaging
Abstract Category Original Research
Aim: In many states with legalized cannabis, there is no legal limit of Δ9-tetrahydrocannabinol (THC) while operating a vehicle. Instead, impairment must be demonstrated by a field sobriety test, followed by analysis of urine for the presence of intoxicants or their metabolites. Thus, there is no empirical test of cannabis impairment. We previously reported that prefrontal cortical (PFC) hemodynamic response during a working memory (n-back) task, detected with functional near infrared spectroscopy (fNIRS), is a biomarker of cannabis intoxication. We sought to determine whether machine learning methods applied to fNIRS data could correctly classify individual participants as impaired from THC.
Methods: 176 cannabis users enrolled in a double-blind, placebo-controlled study, and received up to 80mg of dronabinol, an FDA-approved synthetic THC and placebo in random order. THC dose was individualized to produce intoxication. During each visit, participants completed fNIRS scans while completing a letter n-back task at baseline and at approximately 100 min and 200 min post-THC. Machine learning methods were applied to develop participant level classification of impairment.
Results: There were significantly greater increases post-THC than post-placebo in oxygenated hemoglobin (HbO) concentration throughout the PFC. This effect was driven by participants who reported intoxication and were rated by investigators as impaired. Notably, there was no significant correlation between THC dose and impairment, indicating that HbO increase was sensitive to impairment, not just presence of THC. Using machine learning, temporal feature maps were produced that exhibited high classification accuracies, with an average accuracy of 78%, and a maximum accuracy of 85%.
Conclusions: We replicated our previous finding that HbO response increased during intoxication, and report an extension of this finding in that we achieve individual classification of impairment due to THC intoxication of up to 85% accuracy using ML. We conclude that fNIRS is a promising tool for detection of impairment from cannabis intoxication.

Human Imaging of Dopamine Release After Smoked Cannabis

Ansel Hillmer[1], Katina Calakos[1], Heather Liu[1], Jon Mikael Anderson[1], David Matuskey[1], Yiyun Henry Huang[1], Evan Morris[1], Kelly Cosgrove[1]*
[1]*Yale University*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Imaging
Abstract Category Original Research
Aim: Despite dramatically increasing rates of cannabis use, dopaminergic mechanisms that may underlie cannabis' reinforcing effects are not well elucidated, particularly in people. This positron emission tomography (PET) imaging study used the dopamine D2/3 receptor antagonist [11C]raclopride to examine dopamine release after participants smoked a cannabis cigarette during imaging sessions.
Methods: Study participants (n=12; 5M/7F; 19-32 years) regularly used cannabis ≥5 days/week and/or met DSM-5 criteria for cannabis use disorder, with no other primary diagnosis or psychoactive drug use. Emission data were dynamically acquired for 90 min immediately after administration of 584±95 MBq [11C]raclopride as bolus followed by constant infusion with Kbol=105 min. Participants smoked a cannabis cigarette (0.9±0.1g) containing 3.7-5.6% Δ9-THC using a paced puff protocol over 5 min, beginning 35 min after scanning initiation. The linearized-parametric neurotransmitter PET (lp-ntPET) model (cerebellum as a reference region) was used to detect clusters (>16 voxels) of significant perturbation in [11C]raclopride dynamics in the striatum, which are consistent with dopamine release. The time of peak perturbation within each cluster was also estimated.
Results: Significant clusters of [11C]raclopride perturbation were detected in all twelve scans; however, five scans may have been contaminated by head motion. Of the seven scans clearly uncontaminated by head motion, sixteen clusters of dopamine release were observed throughout the striatum. Of these clusters, nine were located in the ventral striatum, with at least one cluster from each scan. The time of peak perturbation varied from 10-30 min after cannabis smoking began.
Conclusions: These data exhibit perturbations in [11C]raclopride dynamics after smoked cannabis consistent with dopamine release in the ventral striatum. This method shows promise to examine the relationship of dopaminergic dynamics with cannabis' reinforcing effects in people.

Mini-Oral Communication II: Physician Training

Primary Care Provider Perceptions, Attitudes, and Experiences Involving Chronic Pain Management and Cannabis

Kathryn Polak[1], Wally Smith[1], Dace Svikis[1]*
[1]*Virginia Commonwealth University*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Health Services
Abstract Category Original Research

Aim: Cannabis has recently been legalized in multiple countries, and cannabis-infused products (e.g., cannabidiol (CBD)) have surged in popularity. Despite the increased use and availability of cannabis, little is known about provider perceptions and practice regarding cannabis. The present study examined primary care provider perceptions, attitudes, and experiences involving chronic pain (CP) management and cannabis.
Methods: Participants (N=16) were medical residents at a primary care clinic in an urban hospital who completed a 10-minute computer-administered survey on perceptions, attitudes, and experiences involving CP management and cannabis.
Results: Demographically, the sample was predominantly female (56.3%) and 50% were Other race, with a mean age of 29.00 (SD=2.13) years old. While half of residents (50.1%) reported having a lot of experience treating CP patients, 25% reported receiving adequate training in pain management, 18.8% were confident about their knowledge of narcotic pharmacokinetics, and 56.3% disagreed that they know when one of their patients is misusing opioids. Over half (56.3%) agreed both that cannabis can be used to treat CP and is opioid-sparing, whereas none agreed that it produces the same pain relief as opiate pain medications. About two-thirds (68.8%) supported the use of cannabis in patients with CP and 81.3% agreed/strongly agreed that cannabis should be legalized for medical use. None reported having good knowledge around the effects of cannabis. While 56.3% agreed/strongly agreed that they have patients who may benefit from CBD, none reported being aware of the different CBD products available and having good knowledge around the effects of CBD.
Conclusions: Findings suggest that providers do not feel confident in their knowledge involving CP management and cannabis and indicate a need for more comprehensive provider training. Research to evaluate cannabis use as part of pain management is also needed.

Integrating Nurse Practitioner Medication for Addiction Treatment Waiver Training Into Graduate Nursing Curriculum: Attitudes, Perceived Control, and Intention to Prescribe

Karen Hartwell[1], Angela Moreland[1], Catherine Durham[1], Suzanne Lane[1], Faraday Davies[1]*
[1]*Medical University of South Carolina*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: A meta-analysis determined that patients were more satisfied with care provided by Nurse Practitioners (NPs) with no significant difference in health outcomes between care provided by physicians and NPs (O'Connor, 2010), placing NPs in a unique position to increase access to life saving addiction treatment. In 2016, the FDA expanded the privilege of prescribing buprenorphine to qualifying NPs and physician assistants. This study addresses barriers to NP's ability to prescribe buprenorphine by examining attitudes toward prescribing medication assisted treatment (MAT), subjective norms and perceived behavioral control, and the intention to prescribe MAT among NPs who complete the waiver training.
Methods: Students (N=101) enrolled in the NP program at three universities completed a survey prior and immediately following engagement in the Medications for Addiction Treatment 8-hour Waiver Training. The survey measured pre- and post-knowledge, attitudes toward prescribing MAT, subjective norms, perceived behavioral control, and intention to prescribe MAT.
Results: Results demonstrated increased knowledge regarding MAT and prescribing practices from pre- to post-training ($t=3.00$, $p<.01$). Regarding attitudes toward prescribing MAT, students reported being significantly more likely to prescribe buprenorphine ($t=-1.75$, $p<.05$), methadone ($t=-2.44$, $p<.05$), and naltrexone ($t=-2.02$, $p<.05$) after completing the waiver training, as well as increased attitudes that MAT is beneficial ($t=-2.03$, $p<.05$), useful ($t=-2.44$, $p<.05$), good ($t=-2.50$, $p<.05$), effective ($t=-3.27$, $p<.01$), and relevant ($t=-2.15$, $p<.05$). Student

subjective norms did not significantly change from pre- to post-training, although perceived control significantly increased pre- to post-training such that student self-efficacy improved for prescribing all MATs (t=-2.42, p<.05).
Conclusions: Findings demonstrate that outcomes of NP students improved following training, which is consistent with improvements seen in physicians following completion of the training. NP students reported improved knowledge, control over the ability to prescribe, and intention to prescribe MAT following the training. Next steps include examining prescribing practices among NPs and patient satisfaction with NP's prescribing MAT.

An Educational Intervention to Prevent Opioid-Related Harms by Dispensing Appropriate Quantities of Opioids for Acute Pain

Lesley Graham[*1], Mark Fan[2], Sylvia Hyland[3], Beth Sproule[1]*
[1]Centre for Addiction and Mental Health, [2]North York General Hospital, [3]Institute for Safe Medication Practices Canada
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Prevention
Abstract Category Original Research
Aim: Excessive quantities of opioids prescribed for acute pain increase the risk of long-term use and related harms, including opioid use disorder. As part of a larger study, e-learning modules were developed to guide community pharmacists on opioid stewardship, particularly on dispensing appropriate quantities for acute pain.
Methods: E-learning modules, implementation tools (e.g., dosing guidance, morphine equivalence tables) and patient educational materials were developed to overcome barriers to behavior change in pharmacy practice previously identified in the literature. Intervention materials underwent usability testing (4 pharmacists, 4 patients) to identify issues causing confusion, inefficiency, or errors. The intervention was then launched to community pharmacists in 5 randomly selected provincial regions over a 6-month period. Pharmacist pre/post e-learning surveys evaluate knowledge, skills, attitudes and intentions; and a patient survey evaluates knowledge and experiences.
Results: Usability testing showed pharmacists strongly agreed or agreed the modules developed their capability (3/4) and confidence (4/4) to dispense opioid part-fills. Anticipated barriers (e.g., lack of time, remuneration) were not expressed. Most patients (3/4) strongly agreed a counselling session paired with the educational pamphlet would change how they make decisions about their pain medications. Preliminary results from the pharmacist post-module surveys (n=23) indicate most (73-78%) gained knowledge and skills, with the confidence and intention to apply in practice. Most indicated they would always/frequently assess opioid quantities (91%) and offer smaller initial quantities when needed (65%).
Conclusions: An intervention to promote opioid stewardship in acute pain was well received during testing, and preliminary results from the full launch support this. After the 6-month study period, opioid dispensing data in intervention and control regions will be compared. Community pharmacists are well positioned to work with patients from a wide range of prescribers to ensure appropriate quantities of opioids are dispensed for acute pain to help prevent the emergence of opioid use disorder.

Full-Oral Communication II: Neuro

DAT-Interacting Protein, Synaptogyin-3, Alters Dopamine Function and Reduces Cocaine Self-Administration

Emily Peck[*1], Brianna George[1], Paige Estave[1], Sara Jones[1]*
[1]Wake Forest School of Medicine
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Synaptogyrin-3 (SYG3) is a synaptic vesicle protein highly expressed in dopamine-containing neurons that directly interacts with the dopamine transporter (DAT), suggesting a role in synaptic dopamine dynamics. We tested the hypothesis that chronic exposure to cocaine will disrupt SYG3 function, leading to alterations in DAT that drive subsequent excessive cocaine taking.

Methods: Rats were trained to self-administer cocaine, and after successful acquisition, rats were tested on a progressive ratio (PR) schedule of reinforcement. Western blots indicated a significant positive correlation between relative SYG3 and DAT protein levels in the ventral tegmental area, and a significant negative correlation between SYG3 and PR breakpoint. We then overexpressed SYG3 in the VTA of naive rats to assess alterations in baseline behavior and terminal dopamine dynamics. Anxiety-like behavior was assessed using the novel open field test, elevated plus test, and social interaction test. Then, cocaine self-administration behavior was assessed using a long access schedule of reinforcement. In a separate cohort of rats, nucleus accumbens dopamine terminal function was assessed using ex vivo fast-scan cyclic voltammetry (FSCV).
Results: Overexpression of SYG3 in the VTA resulted in greater time spent in the center of the open field, reduced cocaine self-administration, as well as augmented dopamine release and reuptake kinetics in brain slices containing the nucleus accumbens.
Conclusions: Together, these data suggest that SYG3 is a powerful modulator of dopamine kinetics and dopamine-related behavior, indicating this as a fruitful potential target for pharmacotherapeutics to treat cocaine use disorder.

Accumbens Microglial CX3CR1 is Increased Following Chronic Nicotine Self-Administration in Adult Female Rats

Emma Bondy[*1], Erin Maher[1], Cassandra Gipson-Reichardt[1]*
[1]*University of Kentucky*
Abstract Detail Animal Study
Select Drug Category Nicotine/Tobacco
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Neuroimmune mechanisms have been recently found to be involved in nicotine seeking behavior. Further, neuroimmune signaling (including activation of microglia) is sexually dimorphic and controlled by the evolving ovarian hormone milieu associated with cycle phase in females. Thus, the neurobiological mechanisms driving nicotine seeking vulnerability may function in a sex-specific fashion. Microglia are activated following nicotine, and this is a critical neuroimmunological response in the nicotine-induced cellular signaling cascade. One particular receptor, CX3CR1, mediates microglial activation via the nuclear factor-kappa B (NF-κB) pathway, and we have previously found that the NF-κB pathway within the nucleus accumbens core (NAcore) is critical in driving nicotine seeking. Thus, the aim of this study is to examine the role of CX3CR1 in nicotine self-administration (SA), and determine if this mechanism is linked to estrous cycle phase in female rats.
Methods: Female Long Evans rats (N=16) underwent nicotine SA (0.06 mg/kg/infusion) as well as daily vaginal cytology to determine estrous cycle phase. Brain tissue was then harvested for CX3CR1 immunohistochemistry.
Results: Rats readily acquired nicotine self-administration and discriminated between the active and inactive levers ($P = 0.0012$). Further, preliminary results suggest increased NAcore CX3CR1 expression induced by nicotine SA compared to saline controls as measured by immunofluorescence ($P = 0.0034$), indicating potential involvement of this receptor in neuroimmune reactions to nicotine. Ongoing analyses are being conducted to characterize CX3CR1 receptor changes as a function of estrous cycle phase.
Conclusions: Together, these data suggest that CX3CR1 may play a critical role in the neurobiology underlying nicotine use in females.

Changes in Brain Reward Function Following Cathinone Stimulant Exposure in Female Rats

Jacques Nguyen[*1], Yanabel Grant[1], Michael Taffe[1]*
[1]*University of California San Diego*
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Synthetic cathinones, commonly known as “bath salts”, are potent reinforcers and produce stimulant-like effects. In these studies, the intracranial self-stimulation (ICSS) procedure was used to investigate the facilitation of brain reward functioning, as indexed by reduction in reward thresholds, in female rats following exposure to α-PPP, α-PVP or α-PHP.

Methods: Female Wistar rats were prepared with unilateral electrodes aimed at the medial forebrain bundle (coordinates: AP -0.5mm, ML ±1.7mm, DV skull -9.5mm). Rats were trained in a procedure adapted from the discrete-trial current-threshold procedure, with thresholds being defined as the mean of four alternating descending-ascending series. Prior to ICSS testing, rats were administered saline vehicle, α-PPP (0-2.0 mg/kg, i.p.), α-PVP (0-2.0 mg/kg, i.p.), α-PHP (0-2.0 mg/kg, i.p.) or methamphetamine (0.56 mg/kg, s.c) with a 15 minute pretreatment interval. Active drug days were conducted a maximum of twice per week, separated by at least one nondrug session.
Results: Brain reward thresholds were significantly decreased ($p<0.05$) in rats exposed to α-PPP or α-PHP, with similar efficacy and lesser potency compared with methamphetamine. Exposure to α-PVP resulted in modest decrease in ICSS threshold.
Conclusions: These data are the first to confirm the effects of cathinone stimulants on ICSS reward function in female rats. Reduced reward thresholds in the ICSS procedure were consistent with pro-reward effects shown for other psychomotor stimulants such as methamphetamine. Further study may help determine the sensitivity of ICSS behavior to structural differences between drugs.

Dissecting the Role of the Substantia Nigra Pars Reticulata in Opioid Addiction

Ewa Galaj[*1], Guo-Hua Bi[1], Zheng-Xiong Xi[1]*
[1]NIDA IRP
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Opioids are highly addictive drugs whose misuse has greatly contributed to the national opioid epidemic. Abuse liability of opioids has traditionally been thought to derive from drug rewarding effects that involve MOR/GABA-mediated disinhibition of midbrain dopamine neurons. However, this hypothesis has been challenged by recent reports that the rewarding effects of opioids rely on stimulation of mu opioid receptors (MORs) in other brain regions. Notably, the substantia nigra reticulata (SNr), whose native neurons are rich in MORs, has been largely ignored in opioid addiction research. In this study we explored the role of the SNr in opioid-related behaviors.
Methods: Using a highly sensitive RNAscope in situ hybridization technique we determined cell-type specific expression of Oprm1 mRNA, encoding MORs, in the midbrain. With transgenic and optogenetic approaches combined with animal models of addiction, we determined the causal role of SNr GABA neurons in reward-related behaviors.
Results: About 46% of SNr GABA neurons were found to express Oprm1 mRNA. Optogenetic inhibition of SNr GABA neurons produced rewarding effects in vGAT-cre mice, as assessed by intracranial self-stimulation and real-time place preference. We also found that in vGAT-cre mice, response-contingent optogenetic stimulation of SNr GABA neurons reduced heroin reward (as evidenced by compensatory increases in heroin self-administration) and reductions in drug-primed reinstatement of heroin seeking, suggesting a critical role for these neurons in opioid reward and relapse. These findings were corroborated by our additional findings that intra-SNr infusions of naloxonazine or naloxone (MOR antagonists) produced similar effects in rats, well beyond those seen with intra-VTA infusions.
Conclusions: Our findings expand our understanding of the neurobiological mechanisms underlying opioid addiction, pointing to SNr GABAergic neurons as a key player in some aspects of heroin-related behaviors. Importantly, our findings also redefine the primary function of the SNr, which has traditionally been thought to be restricted to motor processes.

Delineating the Molecular Signature Associated With Opioid Craving in the Nucleus Accumbens Shell of Male and Female Rats

Hannah Mayberry[*1], Charlotte Bavley[1], Reza Karbalaei[1], Drew Peterson[1], Angela Bongiovanni[1], Mathieu Wimmer[1]*
[1]Temple University
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Neurobiology/Neuroscience

Abstract Category Original Research
Aim: To define gene expression changes following extended abstinence from chronic morphine or sucrose self-administration in the nucleus accumbens shell of males and females.
Methods: 152 male and 90 female rats underwent 10 days of morphine or sucrose self-administration; controls received saline and/or only cues. After either one or 30 days of forced abstinence, rats were tested for signs of craving, or tissue was collected from the nucleus accumbens shell and processed using RNA sequencing in cue test-naïve rats. Two-way ANOVAs compared active lever presses during early (Day 1) and late (Day 30) abstinence cue tests to assess incubation of craving. Differentially expressed genes (DEGs) were identified by Deseq2 library with a criterion of 50% change in expression. KEGG pathway analyses were conducted to identify enriched biological pathways.
Results: Incubation of morphine craving occurred in both males (active lever presses Day 1 vs Day 30, p=.0001) and females (p=.0163). RNA sequencing revealed 328 DEGs following 30 days of abstinence compared to saline controls, with only 22 of these genes overlapping between males and females. KEGG pathway analyses revealed only four common pathways between males and females. Incubation of sucrose craving also occurred in males (p=.0010) and females (p<.0001). Comparison of the 230 DEGs between controls and the late abstinence sucrose group revealed 10 overlapping DEGs between males and females. Comparison of DEGs across morphine- and sucrose-treated rats revealed only 10 DEGs that overlapped across reinforcers in males, and 6 in females.
Conclusions: RNA sequencing revealed robust changes in gene expression associated with prolonged abstinence that are independent of cue re-exposure. These transcriptomic alterations were sex- and reinforcer-specific, suggesting latent sex differences underlying incubation of morphine and sucrose seeking respectively. These findings lay the groundwork for identifying highly specific therapeutic targets for curbing opioid craving without impacting the natural reward system in males and females.

Wednesday, June 23, 2021

Mini-Oral Communication III: Women's Health

Diestrus is Associated With Higher Nicotine Consumption and Estrogen Receptor Localization Varies With Region-Specificity Within the Mesolimbic Reward Pathway of Freely Cycling Female Rats

Erin Maher[*1], Emma Bondy[1], Cassandra Gipson-Reichardt[1]*
[1]*University of Kentucky*
Abstract Detail Animal Study
Select Drug Category Nicotine/Tobacco
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Women experience higher relapse rates than men, the severity of which varies as a function of menstrual cycle. Specifically, increases in the natural estrogen, 17-β-estradiol (E2), during the preovulatory phase are associated with higher nicotine cravings. E2 binds to estrogen receptors (ERs) on neurons within the ventral tegmental area (VTA) and the nucleus accumbens core (NAcore; key regions within the mesolimbic reward pathway). ER expression is cycle-dependent, and we and others have shown that nicotine consumption does not vary by estrous cycle phase at a lower nicotine unit dose. This study determined if ER localization varies within these regions following nicotine self-administration (SA), and if consumption varies by estrous cycle phase at a higher nicotine unit dose.
Methods: Female Long-Evans rats (n=16) underwent nicotine SA (0.06 mg/kg/infusion; FR-1) and were swabbed daily for vaginal cytology. Brain tissue was then harvested for immunohistochemistry.
Results: Nicotine consumption was significantly higher during the preovulatory phase of the estrus cycle (diestrus, when E2 levels are higher) as compared to the postovulatory phase of the estrous cycle, (estrus, when E2 levels are lower; Mann-Whitney U, P=0.04). ERs were robustly expressed within the VTA and NAcore, however, ERs were localized to the cell body specifically in the VTA.
Conclusions: These results indicate that female rats consume more high-dose nicotine during the estrous cycle phase with higher circulating estrogen than in a cycle phase with less, similar to clinical findings. Further, we show that ERs are localized to cell bodies in the VTA but not the NAcore, demonstrating region-specific ER expression.

Impact of the Natural Hormonal Milieu on Brain Responses to Appetitive Smoking Cues

Teresa Franklin[*1], Kanchana Jagannathan[1], Heather Keyser[1], Nathaniel Spilka[1], Alice Ely[1], Hengyi Rao[1], Reagan Wetherill[1]*
[1]*University of Pennsylvania*

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research

Aim: Women experience more severe health consequences from smoking, have greater difficulty quitting, and respond less favorably to nicotine replacement therapy than men. The influence of fluctuating ovarian hormones, specifically estradiol (E) and progesterone (P), on reward responses to appetitive smoking cues (SCs) may be a contributing factor. Related work suggests that E elevates reward-related responses while P plays a protective role. This study aimed to link hormonal status with striatal (reward) responses to SCs in naturally-cycling chronic cigarette-smoking women.
Methods: This longitudinal, counter-balanced study acquired brain responses to SCs at three time points (i.e., test days) within a participant's menstrual cycle over the course of three cycles. Test days included a SC versus nonSC task during BOLD fMRI acquisition. Test days were carefully timed and biochemically confirmed to occur during the early follicular phase when hormonal influences are low (LEP, control condition); the late follicular phase, when E is high and unopposed by P (HE); and the mid-luteal phase when P is high (HP).
Results: Analyses were conducted in SPM12 using small volume correction (4 mm sphere) centered in the ventral striatum. Contrasts within conditions showed brain responses to SCs versus nonSCs were not significantly different during LEP (p=0.16) and were greater during HE (p=0.009, FWE cor) and HP (p=0.016, FWE cor). Contrasts across conditions showed that HE and HP had greater responses than LEP (p=0.005), and HE had greater responses than HP (p=0.049).
Conclusions: Results suggest that while P may offer protection when E is present (mid-luteal phase), SCs may be the least rewarding when hormone influences are negligible (early follicular phase). This study addresses a critical gap in our knowledge: the natural hormonal milieu's impact on brain responses to SCs, a known relapse trigger.

Effect of Menstrual Cycle Phase and Circulating Estradiol on Responses to Oral Delta-9-Tetrahydrocannabinol

Elisa Pabon[*1], Harriet de Wit[1]*
[1]*The University of Chicago*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Sex/Gender Differences
Abstract Category Original Research

Aim: There is evidence that women are particularly susceptible to adverse, stress-related responses to the drug, such as tachycardia and anxiety. Yet, little is known about sources of risk for adverse responses in women, especially risks related to the menstrual cycle. Preclinical evidence suggests that circulating estrogen levels are associated with adverse responses to cannabinoids. To determine the relationship between estrogen and response to cannabinoids in humans we tested the effects of oral Δ9-tetrahydrocannabinol (THC) vs placebo in healthy female occasional cannabis users at two hormonally distinct phases of the menstrual cycle.
Methods: Forty women received oral THC (7.5 mg, 15 mg) during either the early (EF group) or late follicular (LF group) phase of the cycle. Women were randomly assigned to the two groups, and the drug was administered in a double-blind and counterbalanced design with at least 1 week between sessions. The primary outcome measures were subjective ratings of mood and drug effects and cardiovascular responses. Blood serum estradiol levels were measured at the start each session to confirm phase.
Results: The cardiovascular effects of THC (increased heart rate and decreased high frequency heart rate variability) were similar in the EF and LF phase. Contrary to our hypothesis, the subjective effects of THC were greater, and occurred earlier, during the EF phase, on measures of feeling a drug effect and anxiety. The findings suggest that cycle phase affects subjective, but not cardiovascular, responses to THC.
Conclusions: It remains to be determined why the subjective effects of the drug were more pronounced during the EF, when estrogen levels are low. With additional subjects, we will examine relationships between estrogen and

subjective responses within the phases, and in relation to estrogen levels. Studies of this kind will help to understand the risks of cannabis use, to maximize medical potential and minimize public health risks.

Mini-Oral Communication III: AUC Comorbidities

Neural Correlates of Alcohol Use Disorder Comorbid With Depression

Dongju Seo[*1], Justin Choi[1], Cheryl Lacadie[2], Rajita Sinha[1]*
[1]Yale University School of Medicine, [2]Yale University

Abstract Detail Human
Select Drug Category Alcohol
Topic Neurobiology/Neuroscience
Abstract Category Original Research

Aim: Patients with alcohol use disorder (AUD) comorbid with depression suffer from emotional difficulties and adverse clinical outcomes. To understand neurobiological correlates underlying co-occurring AUD and depression, this study utilized combined functional magnetic resonance imaging (fMRI) and hypothalamic-pituitary-adrenal axis (HPA) measures.
Methods: Participants (N=77; 38 females; age = 32 (s.d.=10)) included 23 AUD with no depression (AUDn), 16 AUD with depression (AUDd), and 38 health controls, matched on demographics (age, gender, education). The status of depression was determined by cutoff scores (AUDn: 0-9, AUDd: >19) of Beck Depression Inventory. During a visual stimulus exposure of of stress (S), alcohol cue(A), versus neutral(N) images in blocks, fMRI and plasma cortisol responses were examined.
Results: AUD patients (AUDn, AUDd) reported higher craving and stress ratings during both stress and alcohol cues than controls ($p<0.001$), with higher stress and alcohol-cue induced craving in AUDd than AUDn ($p<0.01$). AUDd displayed blunted cortisol response in the neutral condition than AUDn ($p<0.05$), suggesting their basal state HPA axis disruption. fMRI results showed significant group difference at $p<0.001$, $a<0.5$ (whole-brain corrected). Compared to controls, both AUDd and AUDn showed decreased activity in the dorsal striatum in Alcohol-Neutral (A-N). In Stress-Neutral (S-N), AUDn showed decreased striatal activity, whereas AUDd showed increased striatal activity with additional decreased activity in the ventromedial prefrontal cortex (vmPFC). When comparing AUDd with AUDn, AUDd showed hypoactivity in ventrolateral PFC in A-N and in the vmPFC in S-N. Additionally, AUDd, relative to AUDn, showed lower activity in A-N, but higher activity in S-N in the striatum.
Conclusions: These results indicate differential neurobiological correlates underlying AUDd vs. AUDn. Hypoactive vmPFC, but hyperactive striatal response to stress in AUDd suggest their stress-related emotion regulation difficulties that could lead to disinhibited, reward-seeking behaviors. Stress and depression management combined with alcohol intervention may be beneficial in treating AUD comorbid with depression.

Coping Strategies Mediate the Association Between PTSD Symptom Heterogeneity and Alcohol-Related Outcomes in U.S. Veterans

Alexandra Palmisano[*1], Sonya Norman[2], Kaitlyn Panza[2], Ismene Petrakis[3], Robert Pietrzak[3]*
[1]Yale University School of Medicine, [2]University of California San Diego; VA San Diego Healthcare System, [3]Yale University School of Medicine; U.S. Department of Veteran Affairs National Center for Posttraumatic Stress Disorder, VA Connecticut Healthcare System

Abstract Detail Human
Select Drug Category Alcohol
Topic Comorbidities
Abstract Category Original Research

Aim: Use of specific strategies to cope with posttraumatic stress disorder (PTSD) symptoms and related consequences of trauma may be a key factor in the maintenance and frequent co-occurrence of PTSD and alcohol use disorder (AUD). To investigate this possibility, we evaluated the role of coping strategies in mediating the relation between a novel, 7-factor model of PTSD symptoms and AUD, alcohol consumption, and alcohol-related consequences in U.S. military veterans.
Methods: Data were analyzed from the 2019-2020 National Health and Resilience in Veterans Study, which surveyed a nationally representative sample of 4,069 U.S. veterans. Veterans completed self-report measures to assess current PTSD symptoms, coping strategies, AUD, and alcohol consumption and consequences. Path analyses were conducted to examine the role of coping strategies—self-sufficient, socially-supported, and

avoidant coping—in mediating associations between a 7-factor model of PTSD symptoms and these three alcohol-related outcomes.
Results: After adjusting for age, gender, and depressive symptoms, (1) dysphoric arousal PTSD symptoms (sleep/concentration difficulties) were associated with increased engagement in socially-supported coping, which was in turn associated with reduced likelihood of AUD; (2) anxious arousal PTSD symptoms (hypervigilance, exaggerated startle response) were associated with decreased use of avoidant coping, which was linked to decreased likelihood of AUD; (3) negative affect (fear, horror, guilt) and externalizing behaviors (irritability/anger) PTSD symptoms were associated with increased use of avoidant coping, which was associated with increased likelihood of AUD; and (4) negative affect and anhedonic PTSD symptoms were associated with increased use of avoidant coping, which was linked to increased alcohol consumption and consequences.
Conclusions: Results of this study emphasize the importance of coping strategies in mediating the relation between distinct PTSD symptom clusters and alcohol-related outcomes. These findings suggest that interventions designed to reduce engagement in avoidant coping strategies and promote engagement in self-sufficient and socially-supported strategies may help mitigate alcohol misuse in trauma-exposed veterans.

The Effects of MDMA-Assisted Psychotherapy on Alcohol and Substance Use in Adults With Severe PTSD

Christopher Nicholas[*1], Jennifer Mitchell[2], Scott Hamilton[3], Berra Yazar-Klosinski[4], Michelle Pleshe[4], Randall Brown[1]*
[1]University of Wisconsin School of Medicine and Public Health, [2]University of California, San Francisco, [3]Stanford School of Medicine, [4]Multidisciplinary Association for Psychedelic Studies
Abstract Detail Human
Select Drug Category Psychedelics
Topic Treatment
Abstract Category Original Research
Aim: Post-traumatic stress disorder (PTSD) is strongly associated with the co-occurrence of alcohol and substance misuse which may confer risk for a complicated treatment course across both conditions. 3,4-methylenedioxymethamphetamine (MDMA) is currently designated as a Breakthrough Therapy for the treatment of PTSD when administered as an adjunct to manualized psychotherapy. Here, we explored changes in alcohol and drug use in adults enrolled in the first phase 3, randomized, double-blind, placebo-controlled trial of the efficacy and safety of MDMA-assisted psychotherapy for severe PTSD.
Methods: Adult participants with severe PTSD (N=100) were randomized and blinded to three experimental psychotherapy sessions with either MDMA or placebo in addition to multiple preparation and integration psychotherapy sessions. Eligible participants could not meet DSM-V criteria for an active substance use disorder (ASUD) at screening. The current analyses examined outcomes on standardized measures of alcohol (e.g. AUDIT) and drug (e.g. DUDIT) use administered at baseline prior to randomization and at study termination.
Results: There were no group differences in AUDIT (MDMA = 4.09 vs Placebo = 2.80) and DUDIT (MDMA = 2.70 vs Placebo = 3.45) scores at baseline. Compared to placebo, MDMA was associated with a significantly greater reduction in AUDIT scores (MDMA $\triangle$ = -1.02 (3.52), n = 42 vs. Placebo $\triangle$ = 0.40 (2.70), n = 40; t(76.57) = -2.06, p = 0.04). Changes in DUDIT scores were not significantly different between treatment groups (MDMA $\triangle$ = -1.36 (3.00), n = 42 vs. Placebo $\triangle$ = -0.77 (5.40), n = 40; t(60.41) = -0.60, p = 0.55).
Conclusions: MDMA-assisted psychotherapy for severe PTSD symptoms may also lead to additional subclinical improvements in alcohol use and does not appear to increase risk of illicit drug use. These data provide preliminary evidence for MDMA-assisted psychotherapy to be developed into an integrated treatment for co-occurring PTSD and ASUD.

Full-Oral Communication III: Fentanyl

Development of a Covalent Poly(Lactic Acid) Naloxone Nanoparticle for Extended Protection Against Fentanyl-Induced Renarcotization

Saadyah Averick[*1], Andrew Kassick[1], Mariah Wu[2], Diego Luengas[2], Marco Pravetoni[3], Michael Raleigh[2]*
[1]Allegheny-Singer Research Institute, [2]University of Minnesota, [3]University of Minnesota Medical School
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids

Topic Chemistry
Abstract Category Original Research
Aim: Accidental and deliberate exposure to fentanyl and related synthetic opioid analogs are the primary catalysts behind the exponential rise in opioid-related fatal overdose in the US. These synthetic opioids are either misused or added as adulterants in counterfeit prescription medications. Although the opioid antagonist naloxone(NLX) is effective antidote, multiple doses of NLX may be administered to avoid renarcotization and death due to NLX rapid metabolism compared to synthetic opioids. To circumvent this shortcoming of NLX and provide greater protection against overdose, this study developed covalent poly(lactic acid-co-glycolic acid) naloxone nanoparticle (NP-NLX) as a delivery platform for sustained-release of naloxone.
Methods: Rats were exposed to repeated s.c. challenges of fentanyl at 0, 4, 24, and 48 hr timepoints and tested for respiratory depression via oximetry or antinociception via the hotplate test of central analgesia. Immediately following testing only after the t=0 hr timepoint, rats were rescued using either NLX or NP-NLX and tested 15 minutes later on the oximeter and hotplate. During all subsequent timepoints, rats did not receive NLX or NP-NLX. Statistical analyses included one-way ANOVAs and t-tests.
Results: NP-NLX was as effective as NLX at reversing fentanyl-induced effects 15 minutes after the initial fentanyl exposure. No effect of fentanyl was seen during subsequent fentanyl treatments due to establishment of tolerance. To circumvent fentanyl-induced tolerance, and to demonstrate efficacy at later timepoints, an independent follow-up study involved rats receiving NLX or NP-NLX 0 hr, but not fentanyl. Fentanyl challenges at subsequent timepoints showed that NP-NLX protected against fentanyl effects during the 4 and 24hr timepoints, while NLX did not.
Conclusions: These results suggest that NP-NLX could be an effective alternative to NLX to reverse fentanyl-induced overdose and prevent renarcotization, and that covalent poly(lactic acid-co-glycolic acid) nanoparticles are an attractive delivery platform for opioid antagonists or other small molecules used in treatment of toxicity.

Effects of Daily Methocinnamox Treatment on Fentanyl Self-Administration in Rhesus Monkeys

David Maguire[*1], Lisa Gerak[1], Charles France[1]*
[1]*University of Texas Health Science Center*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Methocinnamox (MCAM), a long-acting mu opioid receptor antagonist, attenuates the reinforcing effects of opioids such as heroin and fentanyl, suggesting it could be an effective treatment for opioid use disorder. Previous studies characterized effects of relatively large doses of MCAM (≥ 0.32 mg/kg) given acutely or intermittently (i.e., once every 12 days). Because treatment might involve giving smaller doses of a medication more frequently, this study evaluated effects of daily injections of a smaller dose of MCAM (0.032 mg/kg) on fentanyl self-administration.
Methods: Five rhesus monkeys (2 females and 3 males) lever-pressed for i.v. infusions of fentanyl (0.032-10 µg/kg/infusion) or cocaine (32 µg/kg/infusion) under a fixed-ratio 30 schedule. Fentanyl was available most sessions; cocaine was substituted every fourth session. Once responding was stable, MCAM (0.032 mg/kg) was injected s.c. prior to each session for a total of 52 injections, then daily treatment was discontinued. Effects of MCAM were characterized by quantifying changes in the potency of fentanyl (ED50 of the ascending limb of the dose-effect curve) across conditions.
Results: Before MCAM treatment, the number of fentanyl infusions increased and then decreased as a function of dose (mean ED50=0.16 [95% confidence interval: 0.09-0.30] µg/kg/infusion). Daily MCAM treatment decreased responding for fentanyl, but not cocaine, significantly shifting the fentanyl dose-effect curve 20-fold to the right (mean ED50=3.3 [2.0-5.5] µg/kg/infusion). After discontinuation of MCAM treatment, responding for fentanyl recovered within 5 sessions; the fentanyl dose-effect curve shifted back to the left when redetermined 3 weeks later (mean ED50=0.13 [0.08-0.23] µg/kg/infusion).
Conclusions: MCAM decreased self-administration of fentanyl, but not cocaine, and effects were maintained for the duration of treatment. Although antagonist effects of a relatively small dose were surmountable, MCAM produced sustained and selective attenuation of opioid self-administration, supporting the view that it could be an effective treatment for opioid use disorder.

Preclinical Evaluation of Once-Weekly Oral Buprenorphine for Opioid Use Disorder (OUD)

Richard Scranton[*1], Richard Foltin[2], Stephen Zale[1], William Avery[1], Kristine Sykes[1], Nupura Bhise[1], Andrew Bellinger[1], Sandra Comer[2]*
[1]Lyndra Therapeutics, Inc., [2]New York State Psychiatric Institute, Columbia University Irving Medical Center

Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Due to the poor oral bioavailability of buprenorphine, an oral formulation to treat OUD has not been thought possible. Lyndra Therapeutics' novel oral medication platform enables extended drug release which may provide sufficient systemic exposure to permit once weekly oral dosing of buprenorphine. We used a well-established primate model to assess the ability of this unique approach to suppress opioid self-administration.
Methods: Buprenorphine HCl and naloxone HCl were co-formulated in a controlled-release formulation administered in an oral capsule (LYN-013). The star-shaped formulation was configured to release buprenorphine at a near-constant rate over seven days while remaining resident in the stomach, enabling average buprenorphine doses of up to 24 mg/day. Pharmacokinetics were evaluated in dogs (n=12) and cynomolgus monkeys (n=11). Pharmacological effects of multiple dose levels of LYN-013 were assessed in an opioid self-administration model in non-opioid-dependent rhesus monkeys (n=6) and compared with buprenorphine delivered via continuous intravenous and intragastric infusion.
Results: Pharmacokinetic studies in dogs and cynomolgus monkeys demonstrated that LYN-013 delivered sustained buprenorphine drug levels over the dosing period with no evidence of dose dumping. LYN-013 was present in the stomach for at least nine days in dogs and five days in monkeys. In rhesus monkeys, continuous intravenous infusion of buprenorphine (0.1 mg/kg/day, 0.3 mg/kg/day, 0.5 mg/kg/day) demonstrated a dose-dependent reduction in both heroin and fentanyl self-administration. Intragastric infusion of 2 mg/kg/day and 20 mg/kg/day buprenorphine provided similar results. Oral administration of LYN-013 suppressed intravenous fentanyl self-administration with maximal suppression occurring within 48 hours. The decrease in opioid self-administration was sustained for approximately 7 days and returned to baseline by 13 days.
Conclusions: A once-weekly oral buprenorphine dosage form demonstrated sustained suppression of opioid self-administration in monkeys. These promising results suggest that oral delivery of buprenorphine with this novel formulation could provide a new opportunity to treat OUD.

Evidence of Increased Fentanyl Use During the COVID-19 Pandemic Among Opioid Agonist Treatment Patients in Ontario, Canada

Kristen Morin[*1], Shreedhar Acharya[1], David Marsh[1]*
[1]Northern Ontario School of Medicine

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research

Aim: This study aims to present a Canadian perspective on increased fentanyl positive urine drug screen results among opioid agonist treatment patients during the COVID-19 pandemic
Methods: Between January and September 2020, we utilized the electronic medical record from a chain of 67 opioid agonist treatment (OAT) clinics in Ontario, Canada, to examine routinely collected urine drug screen results of patients in OAT. All data were de-identified. The data were cross-tabulated by Public Health Units across Ontario.
The percent positive urine drug screen results were calculated by dividing the number of positive samples by the total number of samples by month. We used a Fractional Logistic Regression model to estimate the differences of fentanyl positive over time. We calculated the odds ratio for each month, keeping January as a reference month. Lastly, using Public Health Ontario, Easy Maps, we displayed the positive fentanyl urine drug screen results by Public Health Units in Ontario.
Results: We present evidence of a 108% increase in the percentage of fentanyl positive urine drug screens from April to September ($p < 0.001$). During the same period, health regions in northern and southwestern Ontario, areas

with a high concentration of rural communities, have seen the most notable increase in the percent of Fentanyl positive urine drug screen results.
Conclusions: We argue that the persistent increase of Fentanyl exposure over time, specifically in the OAT population, suggests that reduced monitoring may decrease OAT's effectiveness and negatively impact patient outcomes.

Fentanyl Use and Initiation on Medication for Opioid Use Disorder Among Treatment-Seeking People Living With HIV

Ryan Cook[*1], Caroline King[1], Phillip Torralva[2], Hansel Tookes[3], Paula Lum[4], Elizabeth Waddell[1], Dennis McCarty[1], P. Todd Korthuis[1]*
[1]Oregon Health & Science University, [2]Oregon Health & Science University / CODA, INC, [3]University of Miami Miller School of Medicine, [4]University of California, San Francisco
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: To estimate the association between fentanyl use and initiation of medication for opioid use disorder (MOUD).
Methods: Data were collected from March 2018 to April 2019 as part of the NIDA Clinical Trials Network CHOICES Scale-up trial (CTN-0067). People with uncontrolled HIV and opioid use disorder (OUD) were randomized to receive HIV clinic-based extended-release naltrexone (XR-NTX) or treatment as usual with buprenorphine or methadone (TAU). Participants provided monthly urine drug screens (UDS), surveys, and medical record data for six months. We used mixed-effects Cox proportional hazards models to estimate associations between baseline fentanyl use and initiation of 1) any MOUD, 2) assigned XR-NTX, and 3) assigned TAU, adjusting for study site (N=8), demographics, severity of opioid use disorder and baseline stimulant use.
Results: Of 114 participants randomized, 78 initiated MOUD during study follow-up (44 buprenorphine, 26 XR-NTX, 8 methadone). Participants positive for fentanyl at baseline (n=71) were half as likely to initiate any MOUD as those who were negative (adjusted HR=0.48, 95% CI 0.28 to 0.84). Participants positive for fentanyl were 12.5 times less likely to initiate XR-NTX (aHR=0.07, 95% CI 0.03 to 0.19), but fentanyl use did not impact the likelihood of initiating TAU (HR=1.62, 95% CI 0.75 to 3.50).
Conclusions: In a clinical trial of HIV and OUD treatment-seeking participants with access to MOUD, baseline fentanyl use was a barrier to MOUD initiation, especially for XR-NTX. As rates of fentanyl use and overdose increase nationwide, efforts to increase treatment initiation must identify and address the unique challenges fentanyl use presents to persons with OUD.

Full-Oral Communication III: Prenatal

Paternal Morphine Exposure Enhances Morphine Self-Administration and Induces Region Specific Neural Adaptations in Reward-Related Brain Regions of Male Offspring

Andre B. Toussaint[*1], Alexandra S. Ellis[2], Angela R. Bongiovanni[1], Charlotte Bavley[1], Reza Karbalaei[1], Samuel Schumacher[1], Hannah L. Mayberry[1], Gregory V. Carr[3], Lee Yuan Liu-Chen[1], Mathieu E. Wimmer[1]*
[1]Temple University, [2]University of Pennsylvania, [3]Lieber Institute for Brain Development
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Paternal lifetime experiences can affect the behavior and physiology of their offspring via epigenetic mechanisms through the germline. The nationwide opioid epidemic highlights the need for better therapeutic approaches for the long-term impact of drug use disorders. We investigated the impact of paternal morphine self-administration on behavior and reward processing in first-generation (F1) progeny, using a multigenerational rodent model of opioid exposure.
Methods: Adult male rats exposed morphine (n=14), or age-matched saline control (n=11) rats were bred to drug-naïve dams (n=6-9/group), and their male and female F1 offspring (morphine-sired and saline-sired) were assessed during adolescence (n=12/group) for social play behavior, a rewarding activity important for social and cognitive

development. In adulthood (n= 8-23/group), these offspring were assessed behaviorally for drug self-administration. Lastly, mu-opioid receptor expression and transcriptomic profiles were assessed in the NAc (n=10/group) and VTA (n=13-15/group) of drug-naïve adult male offspring.
Results: Juvenile morphine-sired male offspring played less than saline-sired controls (t-test, p=0.0487). Specifically, pinning which is the most characteristic posture in social play during this developmental period was considerably reduced in male offspring produced by morphine-exposed sires. Two-way RM ANOVA revealed that morphine-sired male progeny took more morphine (p=0.0031) and worked harder (p=0.0106) to receive infusions of morphine. This phenotype was drug-specific: neither sucrose nor cocaine self-administration was altered by paternal morphine history. Lastly, morphine-sired males had increased expression of mu-opioid receptors in the VTA (p=0.0134) and region-specific changes in gene expression in the NAc and VTA.
Conclusions: These findings demonstrate that chronic opioid exposure in fathers influences developmental milestones such as social play during adolescence and increases opioid addiction-like behaviors in adult male progeny. Our results also suggest that opioid signaling alterations in the VTA may contribute to phenotypes produced by paternal morphine exposure.

Does Maternal Nicotine Metabolism Moderate the Link Between Maternal Cigarette Smoking and Infant Birth Weight? A Collaborative Perinatal Project Investigation

Laura Stroud[*1], George Papandonatos[2], Nancy Jao[1], Raymond Niaura[3], Neal Benowitz[4]*
[1]Brown Medical School and The Miriam Hospital, [2]Brown University, [3]New York University, [4]University of California San Francisco
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: Maternal tobacco use is the largest modifiable risk factor for low birth weight in the US. The nicotine metabolite ratio (NMR; trans-3'-hydroxycotinine (3HC)/cotinine) is a genetically-informed biomarker of nicotine clearance. We investigated maternal NMR as a moderator of links between prenatal tobacco use and birth weight. We also investigated the role of race in these associations, given known racial disparities in both birth weight and NMR.
Methods: Participants were 454 pregnant women (M age=25±6; 11% Black) who smoked cigarettes and their 537 infants from the Collaborative Perinatal Project. Cigarettes smoked per day (CPD) were assessed at each prenatal visit; maternal NMR was assayed from serum collected between 31-36 weeks gestational age (GA). Birth weight was obtained from medical record. Generalized estimating equations were utilized to evaluate associations between CPD, NMR, race, and birth weight–controlling for GA, infant sex, and socio-economic status.
Results: The interaction of CPD and NMR was a significant predictor of birth weight (p=.025). Specifically, among mothers who smoked ≤15 CPD, those with slower NMR had significantly smaller infants (47-98g decrement) compared to those with faster NMR. For mothers who smoked >15 CPD, maternal NMR did not exert a significant influence on birth weight. Black vs. White mothers were also more likely to smoke ≤15 CPD (50% vs. 26%, p<.001) and to be in the lowest quartile of NMR (55% vs 21%, p<.001). The interaction of CPD and race was also a significant predictor of birth weight (p=.01).
Conclusions: This is the first demonstration that the maternal nicotine metabolism phenotype moderates the association between maternal smoking and infant birth weight. Infants of mothers with slower nicotine metabolism may be at heightened risk for morbidity from maternal smoking. Mechanisms underlying effects of race/racism require further study.

Pre- and Postnatal Maternal Smoking and Offspring Smoking Trajectories: Evidence From a 20-Year Birth Cohort

Nicholas Chadi[*1], Marilyn Ahun[2], Catherine Laporte[3], Michel Boivin[4], Richard Tremblay[2], Sylvana Côté[2], Massimiliano Orri[2]*
[1]Sainte-Justine University Hospital Centre, [2]Sainte-Justine Hospital Research Center, [3]Clermont-Auvergne University, [4]Laval University
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Lifespan (Infant, Adolescent, Aging)

Abstract Category Original Research
Aim: Maternal smoking is associated with increased risk of smoking in the offspring. However, it remains unclear whether this association depends on the timing of exposure to maternal smoking. We investigated the association between prenatal and/or postnatal maternal smoking and offspring smoking during adolescence.
Methods: Participants (N=1661), were from the Québec Longitudinal Study of Child Development, a longitudinal birth cohort, which followed male and female children born in the Canadian province of Québec in 1997-1998. We identified longitudinal trajectories of maternal smoking from before pregnancy to child age 12 years using group-based trajectory modeling (GBTM). Adolescent (12-19 years) smoking trajectories were also identified using GBTM. Associations between maternal smoking and offspring smoking trajectories were estimated using multinomial logistic regressions. We used propensity score inverse probability weighting (IPW) to account for the differential distribution of maternal and familial characteristics across exposure groups.
Results: We identified four distinct groups for maternal smoking: non-smoking (n= 1,098, 66%), persistent smoking (n= 313, 19%), decreasing smoking (n=157, 9%), and increasing smoking (n=93, 6%), and three adolescent smoking trajectories: abstinent (n=1,032, 62%), early-onset (before age 15), (n=327, 20%) and late-onset (after age 15), (n=302, 18%). In IPW-adjusted models, youth with mothers with persistent (Relative Risk Ratio (RRR) = 2.12, 95% Confidence Interval (CI): 1.48-3.03), decreasing (RRR=1.86, 95% CI: 1.30-2.65) and increasing (RRR=1.51, 95% CI: 1.04-2.19) smoking had higher risk of being early-onset smokers compared with youth with mothers in the non-smoking group. We also found that only youth whose mothers were persistent smokers had an increased risk of late-onset smoking (RRR=1.82, 95% CI: 1.28-2.59).
Conclusions: Regardless of timing, offspring exposure to maternal smoking is associated with increased risk of smoking during adolescence. More research is needed on how to create effective smoking cessation campaigns that span preconception, prenatal, and postnatal periods to help prevent intergenerational transmission of smoking behaviors.

Brain Responses to Baby Faces in Mothers on Methadone Treatment Correlate With Child Development

An-Li Wang[1], Yuanqi Sun[1], James Padley[2], Zhenhao Shi[2], Dennis Hand[3], Diane Abatemarco[3], Meghan Gannon[3], Neera Goyal[3], Daniel Langleben[2]*
[1]Icahn School of Medicine at Mount Sinai, [2]University of Pennsylvania Perelman School of Medicine, [3]Thomas Jefferson University

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Methadone is an opioid agonist commonly used as a medication for opioid use disorder (OUD) among pregnant and postpartum women. Although rodent studies suggest that the endogenous opioid system plays a key role in maternal attachment, the effects of exogenous opioids is not well understood. Our previous studies found that nonparents' appraisals of unrelated infantile faces are highly correlated with caregiving motivation. In this study, we used functional magnetic resonance imaging (fMRI) to explore caregiving motivation, mother-child bonding and child development among mothers receiving methadone and comprehensive psychosocial treatment for OUD compared with control mothers without OUD.
Methods: Twenty-six mothers with OUD in remission receiving methadone (MM, 92.3% white, 31.12 SD 4.36 y/o) and 18 control mothers (CM, 55.6% white, 29.67 SD 5.35 y/o) were enrolled. Participants were showed a previously validated set of infantile portraits and prompted to rate their caregiving motivation on a scale of 1-7 (1=not at all, 7=very much), while their brain responses were recorded in the MRI scanner. Mother-child bonding was assessed by Mother Infant Bonding Scale (MIBS), and child development was assessed with the Ages and Stages Questionnaire (ASQ). MIBS and ASQ were collected after the MRI session.
Results: There were no differences in caregiving motivation, MIBS and ASQ between groups. The MM but not CM frontal and striatal brain response to the infantile faces was positively correlated with child's communication and personal-social skills variables measured. In CM but not MM, MIBS was positively correlated with their child's gross and fine motor skills.
Conclusions: Our preliminary findings suggest an association between maternal frontal and striatal brain responses as measured by fMRI and child development. Absence of significant differences in child development

between the MM and CM mother-child dyads is consistent with beneficial effects of medications and comprehensive treatment for OUD and warrants further investigation.

Cord Prevalence Substance Use (C-PAST) Study: Anonymous Umbilical Cord Collection to Determine Statewide Prenatal Substance Use in Utah

Marcela Smid[*1], Amanda Allshouse[2], Gerald Cochran[2], Gwen McMillin[3], Kendyl Nunez[2], Tyler Cavin[2], Karen Buchi[2], Michael Varner[2], Torri Metz[2]*
[1]Univeristy of Utah Health, [2]University of Utah, [3]ARUP

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research

Aim: Prenatal substance use (SU) is associated with adverse perinatal outcomes. Drug assays of umbilical cord homogenate detect maternal SU in the third trimester of pregnancy. The aim of this study was to estimate prenatal SU prevalence in Utah using umbilical cord samples and to compare rates across geographic regions and to historical state rates.
Methods: Each Utah hospital with a Labor and Delivery unit (N=45) was approached for participation. A target number of samples for each hospital, oversampling rural and frontier and undersampling urban regions, was calculated from 2017 hospital delivery volume. De-identified umbilical cord samples were collected from consecutive deliveries at each hospital until target number was reached. Cords were assessed using qualitative liquid chromatography/tandem mass spectrometry for opioids, amphetamines, cocaine, benzodiazepines, cannabis, and alcohol metabolites. SU prevalence was calculated overall and by geographic region. Percentages are reported from weighted analysis. For comparisons with historical state data, we utilized data from Buchi et al 2013 (PMID 22 879357) with cords collected March–June 2010, which used similar methodology.
Results: From March-October 2020, 1,748 cords were collected from 37 hospitals, representing 82% of Utah delivery hospitals (urban n=988, rural n=384, frontier n=376); 99.4% (n=1739) cords had quantity sufficient to provide results. Overall, SU prevalence was 9.9% (95% confidence interval, 8.1-11.7%), most commonly opioids (7.0%, 5.5-8.5%) followed by cannabis (2.5%, 1.6-3.4%), amphetamines (0.9%, 0.4-1.5), benzodiazepines (0.5%, 0.1-0.9%), alcohol (0.4%, 0.1-0.7%) and cocaine (0.1%, 0-0.3%). SU prevalence was similar by region (urban=10.3%, 8.3-12.3%, rural=7.1%, 3.5-10.7%, frontier=9.2%, 6.2-12.2%, p=0.31). Compared to historical data, SU prevalence was higher (9.9 vs 6.8%, p=0.01), including opioids (7.0 vs 4.7%, p=0.03), amphetamines (0.9 vs 0.1%, p=0.01) and cannabis (2.5 vs 0.5%, p<0.001).
Conclusions: In Utah, nearly one in ten women had third trimester prenatal SU and overall SU prevalence increased by 31% over the past decade.

Full-Oral Communication III: Stimulant Med Development

Effects of Naltrexone on D-Amphetamine Vs. Food Choice in Rats and Rhesus Monkeys

Hannah Robinson[1], Megan Moerke[1], S. Stevens Negus[1], Matthew Banks[*1]*
[1]Virginia Commonwealth University

Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Aim: In addition to amphetamine's well-known effects at dopamine and norepinephrine transporters, it also promotes the release of endogenous opioids, which may contribute to amphetamine abuse potential. Some studies suggest that treatment with opioid antagonists like naltrexone can attenuate amphetamine abuse-related effects in laboratory animals and humans. This present study evaluated naltrexone effectiveness to decrease amphetamine reinforcement in monkeys and rats responding under an amphetamine-vs.-food choice procedure.
Methods: Methods: Two sets of experiments were conducted using male rhesus monkeys and male and female Sprague-Dawley rats. Subjects responded under a concurrent "choice" schedule of food and d-amphetamine availability during daily 2-h sessions. The food reinforcer was banana-flavored pellets in monkeys and 32% liquid Ensure in rats. The unit amphetamine dose (0-0.1 mg/kg/injection) increased across five successive components in both species. Once baseline amphetamine-choice was stable, naltrexone was administered two ways. First,

naltrexone (0.032-0.32 mg/kg/h) was administered by continuous infusion for 7 consecutive days in both species. Second, contingent naltrexone was administered in combination with amphetamine in fixed-proportion mixtures (0.33:1, 1:1, and 3:1 naltrexone/amphetamine) for 5 (rats) or 7 (monkeys) consecutive days.
Results: Results: Under baseline conditions, amphetamine maintained a dose-dependent increase in amphetamine-vs-food choice in both monkeys and rats. Continuous naltrexone maintenance did not significantly alter amphetamine choice in monkeys, and preliminary results suggest it also fails to attenuate amphetamine choice in rats. Similarly, choice of amphetamine + naltrexone mixtures did not significantly differ from amphetamine alone.
Conclusions: Conclusions: The failure of continuous naltrexone to reduce amphetamine choice in either species argues against the utility of naltrexone maintenance for amphetamine use disorder. Additionally, the failure of contingent naltrexone to alter amphetamine choice suggests that abuse potential of clinically available amphetamine formulations cannot be reduced by addition of naltrexone. Lastly, these results argue against a prominent role for endogenous opioid signaling in amphetamine reinforcement.

NS2359 for the Treatment of Cocaine Use Disorder

Kyle Kampman[*1], Kevin Lynch[1], Wade Berrettini[1]*
[1]*University of Pennsylvania*
Abstract Detail Human
Select Drug Category Stimulants
Topic Treatment
Abstract Category Original Research
Aim: NS2359 blocks the reuptake of dopamine (DA), norepinephrine (NE), and serotonin. It dissociates slowly from these transporters, with a very long half-life in humans. Thus, it may be able to blunt cocaine withdrawal symptoms, reduce cocaine euphoria and cocaine craving. Primate studies showed that NS2359 was able to reduce cocaine self-administration. A human laboratory trial showed that NS2359 was safe and reduced subjective effects of cocaine. The aim of this trial was to determine if NS2359 was potentially efficacious for the treatment of Cocaine Use Disorder.
Methods: This was an 8-week, randomized, double blind, placebo controlled parallel group clinical trial involving 50 subjects with DSM 5 Cocaine Use Disorder. Subjects received 2 mg of NS2359 as the tartrate salt or placebo daily. The primary outcome measure was cocaine use measured by self-report, and confirmed by thrice weekly urine drug screens. Additional outcome measures included the Brief Substance Craving Scale (BSCS), Cocaine Selective Severity Assessment (CSSA) and Clinical Global Impression Scale (CGI). Urine drug screen results, CGI improvement and BSCS scores were analyzed using generalized estimating equations with treatment and study week as covariates.
Results: 35 participants (75%) completed the eight weeks of treatment with no significant difference between groups in retention. Statistical comparisons of cocaine use using generalized estimating equations logistic regression models showed no group by week interaction (Chi-square=0.06, p=0.81) and no significant effect for group (Chi-square=0.14, p=0.71). There was no difference in the percent of subjects in each group who attained three weeks of continuous cocaine abstinence during the last three weeks of the trial; 8% in each group. NS2359 was well-tolerated and there were no medication-associated serious adverse events.
Conclusions: 2 mg of NS2359 as the tartrate salt was well tolerated but was no more efficacious than placebo in promoting abstinence from cocaine in patients with Cocaine Use Disorder.

Augmenting an Enhanced Behavioral Intervention With Extended-Release Mixed Amphetamine Salts for Addressing a Cocaine Use Disorder: An RCT Among Individuals Not Responding to the EBI Alone

Kenneth Carpenter[*1], C. Jean Choi[2], Martina Pavlicova[3], John Mariani[1], Daniel Brooks[2], Edward Nunes[1], Frances Levin[1]*
[1]*New York State Psychiatric Institute, Columbia University,* [2]*New York State Psychiatric Institute,* [3]*Columbia University*
Abstract Detail Human
Select Drug Category Stimulants
Topic Treatment
Abstract Category Original Research

Aim: To test the efficacy of augmenting an Enhanced Behavioral Intervention (EBI) with Extended-Release Mixed Amphetamine Salts to treat a cocaine use disorder among Individuals not responding to the EBI alone.
Methods: A double-blind, randomized placebo-controlled trial tested the efficacy of augmenting an enhanced behavioral intervention (EBI), with mixed amphetamine salt-extended release (MAS-ER) among individuals who did not respond to the EBI alone in the first month of treatment. MAS-ER or matching placebo was titrated to a targeted maximum dose of 80mg/day over a 10-week period. The proportion of participants who achieved three consecutive weeks of abstinence by the end of the study (EOS) was the primary outcome.
Results: One-hundred and forty-five individuals (M(SD)=44 (10) years) presenting with CUD (M=12.3 days of use in past month (SD=6.9)) consented to begin the treatment study. 86 individuals continued their cocaine use throughout the first month of the EBI alone and were subsequently randomized to receive either MAS-ER (n=44; 38 Males) or Placebo (n=41; 33 Males). The proportion of participants achieving 3 or more weeks of abstinence at EOS was not significantly different across treatment groups (MAS-ER=24.4%; Placebo=22.0%; X2(1)= 0.07, p=.78). This finding remained after adjusting for baseline levels of cocaine use, age, gender, and ethnicity (OR=1.13, 95% CI = 0.40, 3.23).
Conclusions: Individuals receiving MAS-ER as a treatment augmenting strategy in the context of an ongoing EBI did not demonstrate greater abstinence then those receiving placebo. While a growing empirical base supports the use of stimulant pharmacotherapy for addressing CUD, identifying specific treatment parameters and participant characteristics in which agonist-based interventions facilitate positive clinical outcomes remain an important area of study.

Citalopram for Treatment of Cocaine Use Disorder: A Bayesian Drop-The-Loser Randomized Clinical Trial

Joy Schmitz[*1], Charles Green[1], Robert Suchting[1], Constanza deDios[1], Jessica Vincent[1], Scott Lane[1], F. Gerard Moeller[2]*
[1]University of Texas Health Science Center, [2]Virginia Commonwealth University
Abstract Detail Human
Select Drug Category Stimulants
Topic Treatment
Abstract Category Original Research
Aim: A body of literature supports the serotonin (5-HT) system as a relevant target for medications development for CUD. The current trial sought to identify the optimal dose of citalopram in a Phase II trial that compared placebo to citalopram at 20- and 40-mg, using a Bayesian adaptive Drop-The-Loser (DTL) design with an interim analysis to potentially drop the dose performing least well. It was hypothesized that citalopram 40-mg would be retained as the most efficacious dose. Here we present final results from this trial and discuss advantages of DTL vs. traditional (non-adaptive) medication development trial designs in addiction.
Methods: The study was a randomized, double blind, placebo-controlled, 10-week clinical trial comparing placebo vs. citalopram 20-mg or 40-mg daily, in adults (N=125) with CUD. A planned interim analysis pre-specified efficacy criteria for dropping the active medication group performing least well, based on the primary endpoint of longest duration of abstinence (LDA) measured by urine drug screens (UDS). Bayesian statistical inference estimated the probability of treatment effects (vs. placebo) at the interim and final analysis.
Results: Interim analysis resulted in retention of the 40-mg treatment arm as the best-performing active condition. Final analysis including all participants indicated an 82% posterior probability (PP) of benefit on LDA for 40-mg (vs. placebo) compared to a 66% PP for 20-mg (vs. placebo). Longitudinal logistic regression did not support a treatment by time interaction, however, across time, the odds of having a cocaine-negative UDS were greater for 40-mg (OR=3.70, PP=97.5%) than 20-mg (OR=1.29, PP=62.8%).
Conclusions: Higher-dose citalopram at 40-mg demonstrated sufficient evidence to warrant moving to a larger trial. The adaptive DTL design showed advantages in terms of statistical precision and efficiency needed for speeding up efforts to identify and test new medications to treat CUD.

Ameliorating Apathy: S-Equol as an Efficacious Therapeutic for HIV-1 Induced Apathy

Kristen McLaurin[*1], Sarah Bertrand[1], Jessica Illenberger[1], Steven Harrod[1], Charles Mactutus[1], Rosemarie Booze[1]*
[1]University of South Carolina
Abstract Detail Animal Study

Select Drug Category Stimulants
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Motivational alterations, including apathy, afflict between 23-46% of individuals living with human immunodeficiency virus type-1 (HIV-1), necessitating the development of an innovative adjunctive therapeutic. S-Equol (SE), a selective estrogen receptor β agonist, has been implicated as a neuroprotective and/or neurorestorative therapeutic for HIV-1 associated neurocognitive disorders; its therapeutic utility for apathy, however, has yet to be systematically evaluated. It was hypothesized that treatment with SE would mitigate apathetic behaviors in HIV-1 transgenic (Tg) rats.
Methods: Ovariectomized Fischer (F344/N) HIV-1 Tg and control rats received either an oral dose of 0.2 mg SE (Control: n=11; HIV-1 Tg: n=11) or vehicle (Control: n=10; HIV-1 Tg: n=10). Following the completion of autoshaping, an aspect of reward expectation (e.g., unit-dose of the reward; schedule of reinforcement: fixed-ratio vs. progressive ratio) was manipulated to elucidate changes in goal-directed behaviors, an index of apathy, for a sucrose or cocaine reinforcer. A priori planned comparisons were evaluated using analysis of variance and/or regression techniques.
Results: At the genotypic level (HIV-1 Tg Vehicle vs. Control Vehicle), HIV-1 Tg animals exhibited a diminished reinforcing efficacy of sucrose (Genotype x Concentration, [$F(4,68)=3.4$, $pGG\leq0.02$]), decreased sensitivity to sucrose, and faster escalation of cocaine intake (Genotype x Day, [$F(1,245)=12.0$, $p\leq0.01$]) relative to control animals. In HIV-1 Tg animals (HIV-1 Tg Vehicle vs. HIV-1 Tg SE), treatment with SE mitigated apathetic behaviors, by enhancing the reinforcing efficacy of, and sensitivity to, sucrose (Regression Analyses: Differential Patterns of Responding). Critically, in HIV-1 Tg animals, SE mitigated the escalation of cocaine intake (Treatment x Day, [$F(1,245)=12.2$, $p\leq0.01$]) relative to vehicle treated animals.
Conclusions: Collectively, SE restored motivated behavior and dramatically reduced cocaine escalation in the HIV-1 Tg rat, expanding the potential clinical utility of SE to include both neurocognitive and affective alterations.

Mini-Oral Communication III: Withdrawal

Effects of Nicotine Vapour Exposure on Reward and Withdrawal in Adolescent and Adult Rats

Jude Frie[*1], Karling Luciani[1], Judy Chen[1], Ahmad Hassan[1], Jaiden Smith[1], Jibran Khokhar[1]*
[1]*University of Guelph*
Abstract Detail Animal Study
Select Drug Category Nicotine/Tobacco
Topic Lifespan (Infant, Adolescent, Aging)
Abstract Category Original Research
Aim: Youth nicotine exposure is a continued concern due to the growing use of electronic cigarettes and their largely unknown addiction liability, especially during vulnerable periods such as adolescence. Thus, the aim of the following research is to assess developmental differences in nicotine vapour-associated reward and withdrawal.
Methods: Experiment 1 - Male adult and adolescent rats (n = 5-6/group) were exposed to either nicotine (JUUL, 5% nicotine) or vehicle (30:70 propylene glycol to glycerol) vapour using the open-source vapour exposure apparatus, OpenVape, for 10 minutes at 3 doses (2, 4, or 8 minutes of active vapour puffs). To evaluate the reward-like properties of nicotine, a biased place conditioning paradigm was implemented. Experiment 2 - Male adult and adolescent rats (n = 7-8/group) were exposed to either JUUL or vehicle vapour for 10 minutes 3 times a day for 2 weeks. 16 hours following their final exposure, rats were injected with 1.5 mg/kg mecamylamine. 20 minutes following injections, rats were scored for somatic signs of withdrawal for a period of 10 minutes.
Results: Experiment 1 - Two-Way ANOVA revealed a significant effect of age ($F(1,45) = 9.872$, $p < 0.003$, $\eta p2 = 0.211$) and dose ($F(3,45) = 7.098$ $p < 0.001$, $\eta p2 = 0.365$). Both adult and adolescent rats showed significant increases in place preference for the nicotine-paired side, with adolescents displaying significant increases at lower doses than adults. Experiment 2 - Two-Way ANOVA revealed a significant effect of treatment ($F(1,25) = 18.232$, $p < 0.001$, $\eta p2 = 0.422$) but not age ($F(1,25) = 0.642$, $p = 0.430$, $\eta p2 = 0.025$).
Conclusions: Our results support the notion that adolescence is a period that is more sensitive to the rewarding effects of, but not withdrawal from, nicotine. Additionally, the withdrawal findings highlight nicotine vapour as a unique route of exposure with distinct behavioural outcomes.

Impact of Opioid Dependence and Withdrawal on Economic Demand for Fentanyl, Methamphetamine, and Cocaine in Rats

Robert Seaman[1], Juan Morales[1], Gregory Collins[1]*
[1]*The University of Texas Health Science Center at San Antonio*
Abstract Detail Animal Study
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: The co-injection of cocaine and heroin (i.e., speedballs) has been common for decades, however, recent estimates suggest the popularity of stimulant-opioid mixtures is increasing, with over 50% of treatment-seeking opioid users reporting regular stimulant use. The goal of the current study was to determine how opioid dependence and withdrawal affect economic demand for fentanyl, cocaine, and methamphetamine.
Methods: Male Sprague Dawley rats were trained to self-administer fentanyl (3.2 ug/kg/inf) under a fixed ratio schedule of reinforcement. Opioid dependence was established by administering escalating doses of morphine (10-40 mg/kg) twice-daily for four days, and subsequently maintained by once-daily injections of 40 mg/kg morphine. To evaluate the impact of opioid dependence and withdrawal on demand for fentanyl (3.2, 10 ug/kg/inf), cocaine (0.32, 1 mg/kg/inf), and methamphetamine (0.1, 0.32 mg/kg/inf), sessions occurred either 12- or 20-hrs after morphine injections, respectively. Response requirements incremented across sessions until no reinforcers were earned. Somatic signs of opioid withdrawal were assessed periodically throughout the experiment.
Results: After establishing opioid dependence, rats exhibited withdrawal signs at 20-hrs, but not 12-hrs, after their most recent dose of morphine. The demand for fentanyl increased (significantly smaller alpha value) in rats deprived of morphine for 20-hrs relative to rats deprived of morphine for 12-hrs and rats that are non-dependent. The reinforcing effects of cocaine and methamphetamine were unchanged by either condition.
Conclusions: The current studies provide direct evidence that the reinforcing effects of fentanyl are increased in opioid-withdrawn rats relative to rats that are dependent on opioids and rats that are not made dependent. Opioid dependence and withdrawal did not affect the reinforcing effectiveness of methamphetamine or cocaine. These findings suggest that motivations to use opioids are dependent on the state of the individual whereas stimulants retain their reinforcing effects regardless of whether the individual is in a state of opioid dependence or withdrawal.

Withdrawal From Oxycodone Self-Administration Increases Cocaine Intake

Shailesh Khatri[1], Hanaa Ulangkaya[2], William Stoops[1], Cassandra Gipson-Reichardt[1]*
[1]*University of Kentucky*, [2]*Arizona State University*
Abstract Detail Animal Study
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Opioid use disorder (OUD) is a leading public health crisis in the United States. Individuals with OUD frequently use other substances concurrently, including cocaine. Opioid withdrawal has been linked to increased cocaine use motivation, although the neurobiology underlying this pattern of co-use is as of yet unknown. Thus, the aim of this study is to develop a preclinical opioid and cocaine co-use model in rats to further evaluate underlying mechanisms.
Methods: Male Sprague-Dawley rats underwent sequential self-administration (SA) of the μ opioid agonist, oxycodone (0.03 mg/kg/infusion; FR-1), followed by cocaine SA (0.25 mg/kg/infusion; FR-1) sessions beginning in acute oxycodone withdrawal (16 hrs after the final oxycodone session) in an A-B-A-B-A-B design. Rats underwent a minimum of 10 oxycodone SA ("A") sessions prior to the first cocaine SA ("B") phase, and somatic signs of opioid withdrawal were measured prior to initiating the first cocaine session during each switch from oxycodone to cocaine SA. Control rats self-administered food followed by cocaine.
Results: Rats readily discriminated between the active (food/oxycodone) and inactive levers ($p<0.01$). Further, the average number of cocaine infusions across phases was higher in the oxycodone compared to food SA group ($p<0.001$), and there was an increasing trend in the total number of oxycodone infusions with each additional switch back to oxycodone after cocaine SA. Somatic signs increased (e.g., foot licks, grooming, among others; $p<0.01$) and body temperature decreased by ~2°C ($p<0.01$) at 16 hrs of oxycodone withdrawal.

Conclusions: These results suggest that oxycodone withdrawal increases cocaine SA. In all, this study establishes the first model of this pattern of polysubstance use which can be further used to study underlying neurobiology.

Monday, June 21, 2021

Virtual Poster Q&A Session I: Alcohol

M1. Intimate Partner Violence as a Predictor of Substance Use Outcomes Among Women: A Systematic Review

Angela Bazzi[1], Shannon Ogden[2], Melissa Dichter[3]*
[1]University of California, San Diego, [2]Boston University School of Public Health, [3]Temple University School of Social Work

Abstract Detail Human
Select Drug Category Alcohol
Topic Epidemiology
Abstract Category Literature Review

Aim: Despite strong correlations between intimate partner violence (IPV) experience and substance use among women, there remains a limited understanding of the ways in which IPV may impact substance use and treatment success. We aimed to analyze existing evidence on IPV as a predictor for subsequent substance use behaviors, disorders (SUD), and treatment outcomes among women to identify research gaps and implications for SUD treatment.
Methods (Optional): We conducted a PRISRM-guided systematic review. We identified and examined studies published between 2010-2020 that assessed IPV experiences as a predictor of subsequent substance use behaviors (i.e., use initiation, increased use), SUD diagnoses, or treatment outcomes (i.e., incomplete treatment, relapse) among women.
Results (Optional): From 576 unique records, we included 10 studies: 4 longitudinal, 4 cross-sectional, and 2 qualitative. Eight were conducted in the United States, one in South Africa, and one in Japan. Alcohol use and alcohol use disorder were the most commonly studied outcomes (n=6), and findings were mixed regarding the significance of IPV being associated with subsequent alcohol use. Three studies examined illicit drug use outcomes, finding that physical and sexual IPV predicted crack/cocaine use or associated with SUD diagnosis. Four studies examining SUD treatment outcomes found IPV to impede treatment utilization and completion and increase the likelihood of relapse.
Conclusions: To our knowledge, this is the first systematic review of the literature investigating whether and on how IPV predicts subsequent substance use behaviors, SUD, and treatment outcomes among women. The majority of studies included in this review examined IPV impacts on alcohol-related outcomes; less research has examined the role of IPV on other drug-related outcomes. Findings highlight the need for diverse SUD treatment modalities to incorporate IPV screening and response into their programming as it may help improve management of SUD and overall health and wellbeing among women.

M2. Reward Drinking and Naltrexone Treatment Response Among Young Adult Heavy Drinkers

Corey Roos[1], Krysten Bold[1], Katie Witkiewitz[2], Robert Leeman[3], Kelly Demartini[1], Lisa Fucito[4], William Corbin[5], Karl Mann[6], Henry Kranzler[7], Stephanie O'Malley[1]*
[1]Yale University School of Medicine, [2]University of New Mexico, [3]University of Florida, [4]Yale University, [5]Arizona State University, [6]Heidelberg University, [7]University of Pennsylvania

Abstract Detail Human
Select Drug Category Alcohol
Topic Pharmacology
Abstract Category Original Research

Aim: This study aimed to (1) identify a reward drinking phenotype among young adult heavy drinkers; (2) evaluate this phenotype as a predictor of naltrexone response; (3) evaluate within-day mechanisms of naltrexone in reward drinkers.
Methods: We conducted a secondary analysis of a randomized placebo-controlled trial of naltrexone for young adult (ages 18-25) heavy drinkers (n=128). Daily surveys assessed affect, urge, drinking, and context. The Drinking Motives Questionnaire was used to identify phenotypes based on reward drinking (enhancement motives) and relief drinking (coping motives).
Results: Among reward drinkers (versus low profile), naltrexone significantly reduced percent days drinking to intoxication (BAC >.08) (PDI) [d=.56; 95% CI (.17,.96)] and percent high intensity drinking days (PHID) (8/10 drinks for women/men) [d=.32; 95% CI(.01,.68)]. Among the high reward/high relief profile drinkers (versus low profile), naltrexone reduced PHID [d=.69; 95% CI(.02,1.50)]. Using latent profile-informed cutoffs and observed scores (for clinical applicability), (1) among cutoff-derived reward drinkers we found a medium-to-large [d=.66; 95% CI(.24,1.16)] and a small effect [d=.28; 95% CI(.04,.72)] of naltrexone in reducing PDI and PHID, respectively; and (2) among the cutoff-derived high reward/high relief subgroup, we found a medium-to-large effect [d=.63; 95% CI(.05,1.1)] of naltrexone in reducing PHID. Among reward drinkers (not other profiles), naltrexone reduced drinking on days a drinking event occurred by weakening the within-day association between positive affect and urges (p's<.05).
Conclusions: Naltrexone had pronounced effects among young adult reward drinkers (high reward/low relief), by reducing urges and drinking on days when individuals had higher positive affect and were exposed to a drinking event. Naltrexone also appeared effective among young adult high reward/high relief drinkers, but not via the same mechanism in reward drinkers.

M3. Automated Reinforcement Management System (ARMS): Focused Provider Feedback

Crystal Smith[1], Nicole Rodin[1], Ron Kim Johnson[1], Michael McDonell[1], Andre Miguel[1], Julie Hwang[1], Sterling McPherson[1]*
[1]*Washington State University*
Abstract Detail Human
Select Drug Category Alcohol
Topic Behavior
Abstract Category Original Research
Aim: To collect detailed provider feedback on the integrated contingency management system, termed Automated Reinforcement Management System (ARMS), and determine future modifications and options that will make the system most feasible, acceptable, and useful for clinicians and patients alike.
Methods: Seven clinicians completed one-hour interviews/focus groups wherein we described the ARMS system and its application to clinical care. Clinicians viewed screen shots of the ARMS provider facing and patient-facing systems. Clinicians provided feedback on their current practices as they related to alcohol use disorder treatment, their preferences for the functionality and look of the application, how they would receive information on their patients, why they and their patients would or would not use the system, their suggestions for improvement, and the proposed intervention in general. To evaluate the qualitative data provided by the focus groups and interviews we elected to use a qualitative descriptive approach with content analysis methods.
Results: The overarching theme of individualized treatment was found throughout the interviews. This sentiment supports use of this app, as it is intended to supplement provider communication and intervention as an adjunctive and customizable tool. Themes of Accountability and Objective Assessment arose in providers' discussions of why people would use the app. Themes within provider obstacles included, Information Overload and Clinical Relevance, and in-patient obstacles, Sustained Engagement and Security Concerns. Two themes emerged regarding suggestions for improvement: Increasing Accessibility and Communication.
Conclusions: This information will be used to modify ARMS to make it more user friendly, time saving, and relevant to treatment. This study will provide baseline capability for implementation of a remotely monitored contingency management platform. If successful, ARMS can potentially provide effective treatment for those living in rural remote areas.

M4. Retention, Engagement, Outcomes and Discharge in the Ria Health Telehealth Treatment Program (RHTP) During the COVID Pandemic

John Mendelson[1], Alex Lee[1], Robert Nix[1], David Deacon[1], Julien Stainback[1], Vincent Sutton[1], Zack Drumm[1], Paul Linde[1]*
[1]*Ria Health*
Abstract Detail Human
Select Drug Category Alcohol
Topic Technology (e.g., mHealth)
Abstract Category Program Descriptions
Aim: The COVID pandemic has accelerated the transition from location-specific to online and digital treatment platforms for most medical conditions, including alcohol use disorder (AUD). The RHTP is an AUD telehealth treatment program where care is covered by insurance or paid for by the patient. Alcohol use is quantified with 1-2X/day breath alcohol concentrations (BAC) and patients are treated with medications and coaching. Here we compare retention in treatment, engagement with treatment, clinical outcomes and reasons for discharge in a pre-COVID cohort (PC), with a during COVID cohort (DC), when COVID restrictions on in-person care became widespread. We also explore relationships between payment source and outcomes.
Methods (Optional): The PC cohort included all patients enrolled from 1/1/20-3/31/20 (N=167); the DC cohort included all patients enrolled from 4/1/20-7/1/20 (N=268). We compared retention in treatment, engagement in treatment (HEDIS scores, program participation), therapeutic outcomes (BACs, medication possession ratios), payment source (self pay; SP vs insurance; Ins) and reasons for program termination.
Results (Optional): 6 month retention in treatment for the PC was 54% vs 59% of DC cohort (p=1.0) There were no differences in engagement scores, outcomes or efficacy between PC and DC cohorts. Insurance status predicted retention (62.5% retained with Ins vs 47.45% SP) but was not different between PC and DC cohorts (SP PC vs DC 47.3 vs 47.6%; Ins PC vs DC 62 vs 67.3; all differences NS). Clinical outcomes were similar between all groups. PC patients were more likely to terminate treatment due to COVID-related financial stress (21.8 PC vs 15% DC of discharges).
Conclusions: 6-month retention in treatment and clinical outcomes in a telehealth AUD treatment program were not affected by the COVID pandemic. COVID-associated financial stress resulted in a higher rate of treatment termination in patients who enrolled before compared to those who enrolled during the pandemic.

M5. Phone-Delivered Screening, Brief Intervention, and Referral to Treatment for Pain Management Among New England Veterans With Chronic Pain: A Pilot Study

John Sellinger[1], Steve Martino[1], Christina Lazar[2], Marc Rosen[2]*
[1]*Yale University Department of Psychiatry,* [2]*Yale University/VA Connecticut Healthcare System*
Abstract Detail Human
Select Drug Category Alcohol
Topic Treatment
Abstract Category Original Research
Aim: Chronic pain puts sufferers at risk for substance misuse. A claim of workplace injury affords an opportunity for early intervention for both conditions. Screening, Brief Intervention, and Referral to Treatment for Pain Management (SBIRT-PM) is designed to engage Veterans seeking disability compensation for musculoskeletal disorders in multimodal pain treatment and to reduce risky substance use, when indicated. Following up on an in-person study, and preparatory for a pragmatic clinical trial, we tested the feasibility and acceptability of a phone-delivered version of SBIRT-PM.
Methods: Forty Veterans from across New England enrolled and were offered up to 4 sessions of phone-based counseling using a motivational interviewing framework. Counseling provided education about and facilitated engagement in multimodal pain treatments. At baseline and 12-week post-assessments, self-reported substance use was measured by the ASSIST and mailing in of nail samples was requested for toxicology analysis.
Results: Although 90% of participants completed the self-reported post-assessment, only 83% returned nail samples at baseline and 58% at post-assessment. Numerically, most measures improved slightly from baseline to week 12. At baseline, Veterans' problematic substance use as measured by the ASSIST was alcohol (33%), nicotine (40%), and other drugs (18%). Nails revealed alcohol use at baseline in 50% of analyzed samples and other drugs in 10%. Only one positive toxicology test (amphetamine, possible prescribed) was in someone who denied substance misuse. Regarding the offered counseling, 80% of participants engaged in at least one session, with a mean of 3 sessions completed.

Conclusions: It was feasible to deliver SBIRT-PM by phone to Veterans across New England, and it was possible to track self-reported study outcomes over 12 weeks. Toxicological analysis of nail samples largely corroborated self-report but follow-up was sub-optimal. Preliminary results suggest SBIRT-PM has promise to engage Veterans in pain services and improve pain and substance use outcomes.

M6. Cost of Contingency Management for Alcohol Use Among Patients With Serious Mental Illness

Thanh Lu[*1], Sean Murphy[1], Sara Parent[2], Michael McDonell[2]*
[1]Weill Cornell Medical College, [2]Washington State University
Abstract Detail Human
Select Drug Category Alcohol
Topic Treatment
Abstract Category Original Research
Aim: Prior work indicates that contingency management (CM) must be modified to effectively treat persons with comorbid serious mental illness (SMI) and severe alcohol use disorder (AUD). Our team is currently conducting a multisite clinical trial testing the relative effectiveness and cost-effectiveness of standard-magnitude CM, high-magnitude CM, and shaping CM (reinforcing reduced drinking prior to requiring abstinence) among this treatment-resistant population. We sought to estimate the implementation and ongoing-management costs associated with each CM strategy.
Methods: A micro-costing analysis was conducted. Semi-structured interviews were conducted with relevant study personnel to estimate the resources required to start and continuously deliver each strategy. The resource-costing method was used, with unit costs derived from sources reflecting national "real-world" costs. The resource-costing method was then used, with unit costs derived from sources reflecting national "real-world" costs. Costs were categorized as (a) fixed, (b) time-dependent, and (c) variable. Year 1 costs included (a), (b), and (c) variable. Subsequent annual costs included (b) and (c). A budget-impact tool was created to estimate total and per-participant costs under various assumptions (e.g., adherence).
Results: Resources included: labor, space, reinforcers, and supplies. Overall, the mean per-patient cost of providing standard-magnitude, high-magnitude, and shaping CM was $2,375, $3,388, and $2,375, respectively. The cost of setting up a CM program and office space is relatively low; thus the mean per-patient cost does not vary considerably across sites. Overall, resources used for the intervention (i.e., labor, reinforcers, and supplies) account for 87% - 91% of the per-patient total cost.
Conclusions: Results of this analysis provide current practical information on the types of costs incurred by providers in the implementation and provision of various CM interventions for the treatment of AUD. This information can help inform providers, payers, and other stakeholders about financial barriers in expanding access to evidence-based AUD therapy.

M7. Within-Subject Administration of Active and Control Scarcity Narratives: Effects on Delay Discounting in Alcohol Use Disorder

William Craft[*1], Allison Tegge[2], Warren Bickel[1]*
[1]Fralin Biomedical Research Institute at Virginia Tech Carilion, [2]Virginia Tech Carilion Research Institute
Abstract Detail Human
Select Drug Category Alcohol
Topic Behavioral Economics
Abstract Category Original Research
Aim: Imagining stressful narratives involving sudden economic scarcity has been shown to increase preference for immediate rewards (i.e., greater delay discounting). However, previous studies have only compared active and control narratives between-groups. Moreover, an investigation of the quantitative effects of different narrative types has not been conducted. In this study active and control scarcity narratives were administered within-subjects in a sample of individuals meeting diagnostic criteria for alcohol use disorder (AUD)
Methods: Individuals with AUD (N=81; 26.9% female) were recruited via Amazon Mechanical Turk. After assignment to the job (N =42) or storm (N = 39) narrative conditions, participants completed delay discounting tasks while imagining the active (job loss/hurricane) and control (job neutral/mild storm) scenario (order

randomized). Paired t-tests were used to compare the effects of narratives within-groups while a linear mixed-effects model was used for a between-groups comparison.
Results: Both active narrative scenarios increased delay discounting rates relative to the corresponding control scenario within-groups (job: p=.001; storm: p=.008), regardless of the order of presentation. Additionally, both narrative types exerted similar effect sizes on delay discounting rates (job: d=.54; storm: d=.45).
Conclusions: These results replicate and extend previous findings on the manipulability of delay discounting rates with stressful narrative scenarios. We demonstrated that the active scarcity scenario significantly increased delay discounting relative to a control scenario within-subject, regardless of the order of presentation. Moreover, the job and storm narratives exerted a similar effect size on discounting rate. These results highlight the robust ability of the Narrative Theory paradigm to shift delay discounting rates and suggest that the valence of a stressful narrative may be more important than the specific details of its content.

M150. The Effects of Place, Race and Gender on Alcohol Use Disorder Among Justice-Involved Adolescents

Skye Bristol[1], Micah Johnson[1]*
[1]*University of South Florida*
Abstract Detail Human
Select Drug Category Alcohol
Topic Racial/Ethnic Differences
Abstract Category Original Research
Aim: Alcohol use (AU) during adolescence is a significant public health problem in the United States, with justice-involved adolescents (JIA) having an increased risk for consequences of drinking. Current research shows alcohol indicators vary geographically by racial and ethnic groups and gender, especially in disadvantaged neighborhoods, with a gap in the literature on JIA. The gaps in research present themselves as a challenge when developing effective and culturally relevant interventions to mitigate the effects of AU among JIA.
Methods: The study will analyze longitudinal data on 40,000 adolescents from the Florida Department of Juvenile Justice (FLDJJ). Adolescents arrested in Florida between 2016 and 2018 were administered the Positive Achievement Change Tool (PACT) assessment during the enrollment process and reassessed every three to six months. Neighborhood characteristics are defined by socioeconomic status and geographic factors using census data. Multilevel analyses will be utilized to test if neighborhood characteristics at intake predict AU and if those patterns differ by race and gender. The study adjusts for known predictors such as age, household income, and family support.
Results: Certain neighborhood characteristics seemed to be associated with higher odds of AU, and this relationship varied by race and gender. Analyses have not yet been completed, but preliminary data show compelling racial differences. Among alcohol users, 37% were White males and 2% were Latinx females. Compared to Whites, Blacks were six times less likely and Latinx were 20% less likely to current AU while adjusting for covariates.
Conclusions: The weathering hypothesis may be a viable model to better address the disparities in AU and related problems. As early AU is associated with other adverse outcomes, advancing our understanding of the stressors and risk factors will aid in culturally relevant and effective prevention and treatment programs to decrease AU and preventing the development of alcohol use disorder in adulthood.

Virtual Poster Q&A Session: Cannabis/Cannabinoids

M8. Social Support Networks: Protective Factors for Marijuana Frequency and Marijuana Problems in Adolescence

Brenna Klesel[1], Carlos Vidales[1], Alan K. Davis[2], Corrine M. Schwarting[1], Brooke J. Arterberry[1]*
[1]*Iowa State University*, [2]*The Ohio State University*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Prevention
Abstract Category Original Research

Aim: Parent support is often cited as a protective factor for adolescent marijuana (MJ) use, though the impact of other social support networks (e.g., peers, other adults) is unclear. This study aims to investigate social support networks as protective factors for adolescent MJ frequency and MJ problems.
Methods: The 2015-2018 National Survey on Drug Use and Health was used to examine MJ problems among adolescents aged 12-17 years that reported past-year MJ use [N=7203; Mage=15.79 (SD=1.19), 50.3% female, 53.1% White]. We examined associations among past-year MJ frequency and problems with social support networks (i.e., nobody, parent/guardian, boyfriend/girlfriend, other adult, other). Demographics included sex, age, race/ethnicity, and family income. One linear regression model examined MJ frequency. One logistic regression model examined MJ problems with past-month MJ and alcohol use as covariates.
Results: Results indicated parent support (B=-11.54, p<.001) and other adult support (B=-12.13, p<.01) was associated with lower MJ frequency. Adolescents that reported no support had higher odds of experiencing physical problems from MJ use (OR=2.77, p<.01) and experiencing friends/family problems from MJ use (OR=1.52, p<.05) than those that reported any support. Adolescents with parental support had lower odds of spending a month or more getting over MJ effects, disengaging from important activities, physical problems, continuing MJ use despite physical problems, and continuing MJ use despite friends/family problems (ORs=0.40-0.72, ps<.05). Adolescents with other adult support had lower odds of MJ tolerance (OR=0.78, p<.05). Adolescents with other support had lower odds of continuing MJ use despite emotional problems (OR=0.61, p<.01).
Conclusions: The present study extends prior research by demonstrating specific social support networks as protective factors for MJ frequency/problems and supports prior research that parent support is vital. Critically, parent and other adult support are protective for MJ frequency, and parent, other adult, other, and any support are protective for MJ problems.

M9. Treatment Seeking for Alcohol and Marijuana Use Disorder: The Influence of Religiosity and Psychological Distress

Corrine M. Schwarting[*1], *Ryan D. Weddell*[1], *Alan K. Davis*[2], *Brenna C. Klesel*[1], *Brooke J. Arterberry*[1]
[1]*Iowa State University*, [2]*The Ohio State University*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Treatment
Abstract Category Original Research
Aim: Alcohol use disorder (AUD) and marijuana use disorder (MUD) are the most common substance use disorders (SUD) among adults (Grant et al., 2016). Although SUD treatment is more common for individuals with comorbid substance use disorders (SUDs) and psychological distress (PD) than SUDs alone (Harris et al., 2019), treatment utilization differs across demographic groups and religiosity (Lefevor, 2020). Religiosity (Lefevor, 2020) and PD (Manuel et al., 2018) have been researched independently in relation to treatment-seeking, but not together. The present study aimed to assess whether religiosity and PD moderated the association for treatment utilization among adults in the U.S. (ages 18 and older).
Methods: The 2018 National Survey on Drug Use and Health was used and included 33,728 US adults (18+) with past-year alcohol or marijuana use. Measures included demographics, religious beliefs/decisions, religious behaviors (i.e. service attendance), PD, perceived need for treatment, treatment utilization (SUD and mental health), and AUD/MUD. Logistic regression was used to determine whether religiosity and PD moderated the relation between AUD/MUD and treatment utilization.
Results: PD moderated associations between AUD/MUD and SUD treatment (OR=1.00, p=.001), mental health (OR=1.02, p<.001), and perceived treatment need (OR=1.01, p<.001). Notably, lower PD scores were associated with greater odds of SUD treatment, mental health treatment, and perceived treatment need, and higher PD scores were associated with lower odds of mental health treatment (ORs=0.89-1.09, p<.003). Religiosity did not moderate the association between AUD/MUD and treatment utilization.
Conclusions: A complex relationship exists between religiosity, psychological distress, and treatment-seeking among people with a SUD. These findings support existing research on psychological distress and treatment seeking for SUDs. Existing research shows religiosity is linked to better treatment outcomes for individuals seeking treatment for mental health and SUDs. Although, further exploration is needed to understand the role of religiosity and treatment utilization for AUD/MUD.

M10. Evaluating the Role of Sleep in Memory Impairment in Heavy Cannabis Users

Dalton Edwards[*1], Francesca Filbey*[1]
[1]*University of Texas at Dallas*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research

Aim: Previous literature has found evidence to support the association between cannabis use and sleep impairment. Given that sleep is crucial to cognitive functioning, particularly memory, it is important to evaluate the link between sleep and memory in cannabis users.
Methods: To that end, we analyzed the relationship between Wechsler Memory Scale (WMS) logical memory and visual reproduction sub-tests and self-reported measures of sleep in 126 heavy cannabis users (78 males, mean age: 30.53) and 109 non-users (54 males, mean age: 30.26). ANOVAs were computed to evaluate the effects of group (control, cannabis users) and self-reported sleep difficulties (none, mild, moderate, severe) on memory.
Results: For logical memory, we found a significant main effect of sleep, $F(1, 201) = 5.10$, $p = .025$, such that more sleep difficulties were associated with lower scores on immediate logical memory. No other significant effects were found for immediate or delayed logical memory. For visual reproduction, there was a significant main effect of group (immediate: $F(1, 201) = 9.00$, $p = .003$; delayed $F(1, 201) = 6.95$, $p = .009$), and self-reported sleep difficulties (immediate: $F(1, 201) = 12.476$, $p < .001$; delayed: $F(1, 201) = 15.26$, $p < .001$) , such that both immediate and delayed visual reproduction scores were significantly lower in cannabis users compared to controls and more sleep difficulties were associated with lower scores on immediate and delayed visual reproduction. Lastly, no significant interactions were observed between sleep difficulties and group type for immediate or delayed visual reproduction.
Conclusions: Probing for the potential association between sleep impairments and memory performance in cannabis users is critical for understanding how potential negative effects of cannabis use may manifest.

M11. Marijuana Product Access, Use, and Association With Psychological Distress During the COVID-19 Pandemic: A Cross-Sectional Online Pilot Survey

Danielle Ompad[*1], Daniel Hagen[1], Simon Sandh[1], Kyle Snyder[1], Mirtala Sanchez[1], Melody Goodman[1], Emily Goldmann[1]*
[1]*New York University School of Global Public Health*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research

Aim: To examine changes in access to and use of marijuana products and the association between non-specific psychological distress (NSPD) and increased marijuana use during the COVID-19 pandemic.
Methods: We conducted a cross-sectional online survey of residents of the US and US territories aged 18+ who had used marijuana in the prior 3 months. Participants were recruited via paid advertisements on Facebook and Twitter; unpaid posts on Facebook, Twitter, and LinkedIn; and word of mouth. Data were collected via Qualtrics from May to November 2020.
Results: Among 1,319 participants, the mean age was 43.2 years (SD=16.1, range 18-79); 42% lived in states with medical marijuana policies and 36% with recreational marijuana policies. The sample was 41% men, 56% women, and 3% transgender, non-binary, or gender non-conforming; 10% Hispanic/Latino; 79% white; and 28% LGBQ. Based on the Kessler-6 (K6), 17% reported NSPD indicative of severe mental illness (K6≥13). During the pandemic, 42% reported stocking up on marijuana products, 16% reported difficulties getting marijuana products, and 69% said their access did not change. With respect to changes in smoking and/or vaping marijuana, 53% said their frequency stayed the same, 20% stopped or cut down, and 26% increased their frequency. For edibles, 28% did not use edibles, 9% used a smaller amount, 9% used a larger amount, and 3% initiated use during the pandemic. NSPD was not associated with changes in smoking/vaping frequency during the pandemic after controlling for age, gender, race, and state-level marijuana policy.
Conclusions: Access to and use of marijuana has changed during the pandemic for some respondents and approximately 1 in 4 increased marijuana use. Our hypothesis that NSPD is associated with increased use was not

confirmed in these data. Further research is needed to understand changes in marijuana use frequency during the pandemic.

M12. Pharmacokinetic Profile of Cannabidiol (CBD), Δ9-Tetrahydrocannabinol (THC), and Their Metabolites in Blood and Urine Following Oral and Vaporized CBD and Vaporized CBD-Dominant Cannabis Administration

Dennis Sholler[1], Tory Spindle[1], Cecilia Bergeria[1], Edward Cone[1], Elia Goffi[1], David Kuntz[2], John Mitchell[3], Ruth Winecker[3], George Bigelow[1], Ron Flegel[4], Ryan Vandrey[1]*
[1]Johns Hopkins University School of Medicine, [2]Clinical Reference Laboratory, [3]RTI International, [4]Substance Abuse and Mental Health Services Administration

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Pharmacology
Abstract Category Original Research

Aim: The use and availability of oral and inhalable cannabidiol (CBD) products have increased drastically in recent years. Commercial CBD products often contain low levels of Δ9-tetrahydrocannabinol (THC). Controlled clinical research on CBD products with and without low THC levels is scarce.
Methods: Eighteen healthy adults (50% female) completed four, double-blind, double-dummy, acute drug administration sessions: 100mg oral CBD, 100mg vaporized pure CBD, vaporized CBD-dominant cannabis (100mg CBD/3.7mg THC), and placebo; six participants completed an optional 5th condition. Oral CBD was administered in one of three formulations: capsule, syrup, or Epidiolex® (n=6 participants/formulation). Syrup was administered after a low-fat breakfast and under overnight fasting conditions (5th condition). Whole blood and urine samples were collected repeatedly over 58 h after each drug administration.
Results: Blood CBD concentrations were higher following inhalation of CBD-dominant cannabis compared to pure CBD, and inhaled CBD produced significantly higher blood concentrations compared with any oral formulation. CBD bioavailability in blood was greater following Epidiolex® versus capsule or syrup administration. Blood CBD levels were lower following overnight fasting compared to when CBD syrup was administered after a low-fat breakfast. Pure CBD (oral or vaporized) did not increase blood THC or urinary THCCOOH concentrations (target analyte in urine drug tests for cannabis). However, following CBD-dominant cannabis administration, 3/18 participants tested positive for cannabis using federal workplace drug testing guidelines.
Conclusions: There was no evidence that CBD converts to THC in vivo, including in a fasted state, contrary to in vitro studies modeling the human gastric environment. The use of CBD/hemp products containing low THC levels may produce cannabis-positive drug test results. Additional research is needed to characterize the effects of chronic CBD use on drug testing outcomes and the pharmacokinetics of oral and vaporized CBD at higher doses, alone and in combination with varying THC doses.

M13. Evaluating Factors Related to Long-Term Episodic Memory Impairment in Heavy Cannabis Users

Erin Horne[1], Francesca Filbey[1]*
[1]University of Texas at Dallas

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research

Aim: Since memory is an important facet of human life, it is of great interest to identify factors influencing the effect of cannabis on memory. Acute memory impairments have been consistently identified under the influence of cannabis but reports of long-term effects on memory performance are mixed. Long-term cannabis-related memory impairment is likely moderated by factors such as the age at which cannabis use was initiated, the duration of use, and demographic factors such as sex and education.
Methods: Here we examined measures of immediate and delayed recall in a sample of 126 heavy cannabis users and 111 non-using participants. Memory measures comprised scaled scores from the immediate and delayed Logical Memory (LM) and Visual Reproduction (VR) subtests of the Wechsler Memory Scale (IV). Group x sex

ANOVAs for each of the memory subtests identified significant effects on all but immediate LM; significant effects were investigated using ANCOVAs controlling for age and education.
Results: For delayed LM, female participants outperformed males regardless of group (p = .03, with covariates p = .05) and non-users performed marginally better than cannabis users (p = .06, with covariates p = .71). For immediate and delayed VR, non-users outperformed cannabis users (immediate: p < .001, with covariates p = .05, delayed: p <. 001, with covariates p = .07). For delayed VR, males scored higher than females regardless of group (p = .07, with covariates p = .02). Median splits of cannabis users by onset of regular use (18 years) and duration of use (8 years) did not reveal memory differences.
Conclusions: Overall, our findings add to evidence for long-term memory impairment linked to cannabis use and suggest that sex differences in performance may be sensitive to how memory is tested. Further research is warranted to disentangle the contributions of these and other factors.

M14. Keep Calm and Carry On: Results From the Open Label Phase of the First Clinical Trial Examining a Full Spectrum, High-Cannabidiol Product for Anxiety

Staci Gruber[1], Ashley Lambros[2], Rosemary Smith[2], Kelly Sagar[1], Mary Dahlgren[1]*
[1]*McLean Hospital, Harvard Medical School,* [2]*McLean Hospital*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Alternative Medicine
Abstract Category Original Research
Aim: Acute administration studies demonstrate that cannabidiol (CBD), a non-intoxicating cannabinoid, has anxiolytic properties and may mitigate negative physiological and cognitive effects associated with delta-9-tetrahydrocannabinol (THC). However, clinical trials are needed to assess the impact of high-CBD products. We conducted a clinical trial of a high-CBD sublingual product for anxiety, hypothesizing improved clinical state accompanied by stable or improved cognitive performance.
Methods: Fourteen patients (11M, 3F) exhibiting moderate to severe anxiety completed this open-label phase assessing a plant-derived, full-spectrum high-CBD sublingual product, custom-formulated to address symptoms of anxiety. Patients self-administered 1mL of the study product containing 10mg/ml CBD three times/day for four weeks. In addition to assessing anxiety and related symptoms (mood, sleep, quality of life), patients completed a cognitive battery assessing executive function and verbal learning/memory before and after four weeks of treatment. Repeated-measures ANOVAs assessed changes over time.
Results: No adverse events or feelings of intoxication were reported. After four weeks, patients exhibited significant reductions on measures of anxiety (Overall Anxiety Severity and Impairment Scale; Beck Anxiety Inventory), improved mood (Beck Depression Inventory), and better sleep (Pittsburgh Sleep Quality Index) (all ps<.001). Participants also reported improvements on the World Health Organization Quality of Life (WHO-QOL) subscales for Physical Health, Psychological Health, and Social Relationships (all ps<.01); WHO-QOL Environment subscores remained stable (p=.11). Improvements on tasks of executive function were also generally noted (e.g., Stroop Interference time: p<.001). Although decreased performance was observed on a measure of verbal learning (Rey Auditory Verbal Learning Test [RAVLT] Trials 1-5 Correct: p=.04), memory remained stable relative to baseline (e.g., RAVLT Long Delay, p=.40).
Conclusions: Initial results are promising and suggest that a full-spectrum, high-CBD product may be efficacious for treating anxiety; however, a definitive assessment of the impact of this novel treatment on clinical symptoms and cognition will be ascertained in the double-blind, placebo-controlled phase.

M15. Behavioral Correlates of Attentional Network Differences in Cannabis Using Adolescents and Young Adults

Julia Harris[1], Alexander Wallace[1], Alicia Thomas[1], Krista Lisdahl[1]*
[1]*University of Wisconsin-Milwaukee*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Neuropsychological studies have demonstrated that young regular cannabis users demonstrate poorer sustained and selective attention. Few studies have examined underlying neuronal signaling in attentional

networks in adolescent/young adult cannabis users or characterized relationships with cannabis use patterns. Here, we report resting state functional connectivity (RSFC) patterns in the dorsal (DAN) and ventral (VAN) attentional networks along with correlated cannabis use patterns in young cannabis users.
Methods: Differences in RSFC within the DAN and VAN were examined in 20 young cannabis users and 49 non-substance using controls following three weeks of abstinence. Substance use variables were measured using the Customary Drinking and Drug Use Record and Timeline Followback interview. Clusters demonstrating connectivity differences were correlated with past year and lifetime cannabis use, length of abstinence, age of regular use onset, and cannabis use disorder symptoms.
Results: Significant group differences in functional connectivity were found between the right temporal-parietal junction (TPJ; seed region) and the right cerebellar vermis, left paracentral lobule, left middle temporal gyrus, and right anterior cingulate. Among cannabis users, there was a negative relationship between increased length of abstinence and positive connectivity between the TPJ and the left paracentral lobule ($r = -0.402$, $p = 0.012$), and a positive relationship between increased lifetime cannabis use and positive connectivity between the TPJ and the right anterior cingulate ($r = 0.349$, $p = 0.032$).
Conclusions: Results demonstrate that abnormal connectivity within the DAN and VAN are associated with length of abstinence and lifetime cannabis use among young cannabis users, even after three weeks of abstinence. Dysfunction of the DAN and VAN may underlie the neurocognitive changes in attention seen in young cannabis users and behavioral aspects of cannabis use may contribute to this relationship. Longitudinal studies are needed to address causality.

M16. Associations Between Reasons for Using Marijuana and State-Level Marijuana Legalization Policies: A Cross-Sectional Online Pilot Survey

Kyle Snyder[*1], Mirtala Sanchez[1], Daniel Hagen[1], Simon Sandh[1], Emily Goldmann[1], Melody Goodman[1], Danielle Ompad[1]*
[1]*New York University School of Global Public Health*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: To examine reasons for using marijuana by state-level marijuana legalization policy.
Methods: A cross-sectional online survey of residents in the US and its territories was conducted from May-November 2020. Participants were aged 18+ and had used marijuana in the prior 3 months. Recruitment was conducted using paid social media advertisements on Facebook and Twitter and unpaid posts on Facebook, Twitter, and LinkedIn. Separate multiple logistic regression models examined associations between state-level marijuana policy (medical marijuana legalization, MML; recreational marijuana legalization, RML; or neither) and different reasons for using marijuana adjusted for age, gender, race/ethnicity, and medical marijuana prescription.
Results: Reasons for using marijuana were reported by 1,508 respondents; 40.1% lived in states with MML, 35.1% with RML, and 24.8% with neither. The mean age was 43.3 (range:18-79, SD:16.2); 55.2% were female; 3.2% were transgender or another gender; 14.3% were non-white; and 10.1% were Latinx. Main reported reasons for using marijuana were relaxation (28.9%), recreation/entertainment (21.8%), physical health conditions (21.1%), and mental health conditions (13.0%). Compared to participants in states without marijuana legalization, respondents in RML states had lower odds of using mainly for physical health conditions (AOR=0.57; 95%CI:0.39,0.84) and higher odds of using mainly for relaxation (AOR=1.38; 95%CI:1.01,1.88) in adjusted logistic regression models; no statistically significant differences were detected for MML states. Older age was generally associated with lower odds of mainly recreational use and use for mental health conditions, and higher odds of use for physical health conditions. Compared to males, females were more likely to use mainly for mental and physical health conditions and less likely to use for recreation and relaxation.
Conclusions: Respondents in RML states were more likely to report using marijuana mainly for relaxation and less likely to use mainly for physical health conditions. This suggests that state-level policies may impact reasons for using marijuana.

M17. Does Medical Marijuana Help Improve Sleep and Symptoms of Post-Traumatic Stress Disorder? Evidence From a Pilot Study

Krishna Vaddiparti[1], Carly Crump[1], Zhi Zhou[1], Yan Wang[1], John Williamson[1], Robert Cook[1]*
[1]*University of Florida*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Epidemiology
Abstract Category Original Research

Aim: Posttraumatic stress disorder (PTSD) is a debilitating disorder that occurs following a life-threatening trauma. PTSD is associated with sleep disturbances, nightmares, and poor mental health quality of life. Medical marijuana (MMJ) is often used to improve sleep and other PTSD-related symptoms, but at this point, we lack evidence on its effectiveness as a therapy for PTSD.
The goal of this presentation is to examine how MMJ affects sleep quality, PTSD symptoms, mood, and physical and mental well-being up to 70 days after initiation.
Methods: We recruited 15 patients who met criteria for PTSD seeking to start MMJ for their symptoms. Participants were recruited from medical cannabis clinics in North-Central Florida and assessed at three time points: baseline – prior to starting MMJ, and 30- and 70-days after MMJ initiation. Measures included the PTSD checklist for DSM-5 (PCL-5), Pittsburgh Sleep Quality Index (PSQI), Positive and Negative Affect Schedule (PANAS), and PROMIS Global Health. SAS PROC general linear modeling was used to compare outcomes from baseline to 30- and 70-days. All 15 participants completed 30- and 70-day assessments.
Results: Participants' mean age was 44 years (SD 11.9), 80% were white, and 60% were female. Majority (73%) used other drugs in their lifetime. Results demonstrated significant improvements at 30- and 70-day follow-up in PTSD score [$F(2,24)=13.25$], PSQI score [$F(2,25)=16.54$], Sleep quality [$F(2,27)=22.57$], Sleep duration [$F(2,27)=8.33$], nightmares [$F(2,26)=13.87$], negative affect [$F(2,26)=9.82$], and mental health [$F(2,27)=8.44$]. All outcomes were statistically significant at $p<0.05$.
Conclusions: In this sample of 15 adults with confirmed PTSD who were starting medical marijuana, there were significant improvements in sleep and mental health well-being and decreases in PTSD symptoms and nightmares, with effects lasting at least 70- days after initiation. Future research could confirm these findings using a control population and physiological measures of sleep quality.

M18. Effects of Cannabinoids on Ethanol-Induced Motor Impairments Using the Rotarod Test in Mice

Masahiko Funada[1], Tomiyama Kenichi[2]*
[1]*National Institute of Mental Health,* [2]*National Center of Neurology and Psychiatry*

Abstract Detail Animal Study
Select Drug Category Cannabis/Cannabinoids
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: A large number of new psychoactive substances (NPS) are currently found and sold at illicit drug markets, with synthetic cannabinoids among the substances that have led to serious side effects. Synthetic cannabinoids, which are now recognized as NPS, have also become a problem, as they can cause physiological changes and impairment in users. These effects are similar to those seen with cannabis use. Marijuana and alcohol are the most popular drugs amongst recreational users. In the present study, we investigated the effects of acute administrations of delta-9-tetrahydrocannabinol (THC) or synthetic cannabinoids on ethanol-induced motor impairment through the use of the rotarod test in mice.
Methods: Evaluation of the motor impairment was accomplished by the use of a standard mouse rotarod performance test (UGO Basile, Varese, Italy). Mice evaluated for the drug combination study were injected with the synthetic cannabinoids, JWH-018, AB-CHMINACA or THC, at 10 min prior to the administration of ethanol. In addition, the involvement of cannabinoid CB1 receptors was examined. In neurochemical study, we investigated the effects of combined use of both synthetic cannabinoids and ethanol on the extracellular glutamate levels in the cerebellum.
Results: Ethanol significantly induced motor impairment in the accelerating rotarod test in mice. Furthermore, ethanol-induced motor impairments were further accentuated when combined with JWH-018 or AB-CHMINACA. The enhancement effects of the synthetic cannabinoids were completely antagonized by pretreatment with the

selective CB1 receptor antagonist AM251. Neurochemical study results showed that ethanol caused a reduction in the extracellular glutamate levels in the cerebellum during periods of ethanol-induced motor impairment.
Conclusions: Our findings demonstrate that ethanol-induced motor impairments are enhanced by synthetic cannabinoids, with these effects potentially mediated by CB1 receptors. An accentuated reduction of neurotransmissions in the cerebellum may play an important role in motor impairments caused by ethanol combined with synthetic cannabinoids.

M19. Sleep in Heavy Marijuana Users After Smoking Differing THC "Doses"

Mohammad Sibai[*1], Gail Koshorek[1], Jelena Verkler[1], Timothy Roehrs[1], Leslie Lundahl[2]*
[1]Henry Ford Health System, [2]Wayne State University School of Medicine
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Sleep disturbances are commonly reported by chronic marijuana (MJ) users and often identified as reasons for relapse. In the current study we compared the sleep architecture of 12-heavy MJ-users who smoked Hi vs Lo "doses" of 7% THC over a 4-day period.
Methods: Participants met DSM-V criteria for cannabis use disorder but were otherwise healthy individuals. On study day 1, individuals smoked 11 puffs of cannabis (7% THC). During the following three days, under varying experimental contingencies, the Hi-group averaged 7±3 (day1), 8±2 (day2), and 7.67±2 (day3) puffs from a marijuana cigarette containing 7% THC, while the Lo-group averaged 2±2 (day1), 2±2 (day2), and 1.83±2 (day3) puffs. Sleep was recorded during the first four study nights using standard polysomnography procedures at Henry Ford Sleep and Research Center (2300-0700 hr). No participants reported a history of sleep-related disorders. PSG recordings were scored using Rechtschaffen and Kales standard criteria.
Results: Individuals in the Hi-group had significantly different REM, N1, N2, and N3/4 sleep time compared to the Lo-group. Stage-1 sleep decreased in the Hi group (means day1 58.92, day 2 61.08, day 3 52.08, day 4 46.92) while increasing in the Lo group (means day1 32.00, day2 36.33, day3 38.92, day4 43.25). Stage-3 sleep duration increased across both groups, especially the Hi-group (means day1 6.25, day2 8.00, day3 14.75, day4 13.83). Individuals in the Hi-group showed differences in total sleep time. Their sleep decreased substantially by night-4 for the Hi-group compared to the Lo-group (means 383.72 (±70.99), 404.67 (±26.87)).
Conclusions: These groups showed differing patterns of sleep effects over four nights. While not statistically different, the Hi-group appears to be older with a longer cannabis use history. The role of these differential sleep effects in the ability to discontinue cannabis use is yet to be determined.

M20. Mood Disorder Comorbidity and Familial Aggregation of Cannabis Use Disorder

Courtney Quick[*1], Emma Stapp[1], Kevin Conway[1], Lihong Cui[1], Kathleen Merikangas[1]*
[1]National Institute of Mental Health
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Studies of both community and clinical samples demonstrate links between cannabis use disorder (CUD) and mood disorders, but the explanation for this association remains unclear. This study examines patterns of comorbidity, familial aggregation, and co-aggregation of CUD and mood disorders in two contemporary family studies to gain insight into potential etiological mechanisms for this association.
Methods: We employ data from a collaborative study in the U.S. (NIMH Family Study of Affective Spectrum Disorders) and Switzerland (Lausanne/Geneva Family Study) to examine these aims. The sample includes 590 probands and 704 first-degree relatives from the NIMH study and 552 probands and 835 first-degree relatives the Swiss study.
Results: Results of mixed models showed that CUD was significantly associated with mood and anxiety disorders both in probands and relatives, and that both CUD and mood disorders were familial. However, there was no significant cross-aggregation of CUD and mood disorders in probands and relatives. In the NIMH sample, the onset of mood disorders tended to precede that of CUD. In both samples, relatives of probands with CUD had a significantly earlier onset of CUD than relatives of controls.

Conclusions: These findings show that although CUD is familial, there is no evidence for a common familial diathesis for CUD and mood disorders. When taken together with patterns of onset, results suggest that CUD may be a consequence of mood disorders that may benefit from upstream intervention. We will also present differences in these associations among siblings and offspring as well as specific subtypes of mood and anxiety disorders.

M21. Emerging Trends in Methods and Patterns of Regular Cannabis Use in Youth

Raymond Hsu[*1], Michael Sofis[1], Alan Budney[1]*
[1]Geisel School of Medicine at Dartmouth
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Prevention
Abstract Category Original Research
Aim: Legal cannabis provisions have led to greater availability of cannabis and coincided with more frequent and heterogenous methods of use, which is concerning for vulnerable populations such as youth. Little is known about how emerging patterns of cannabis use influence transitions to regular use and multiple methods of use.
Methods: Youth (ages 14-25) who used cannabis at least weekly for a month were recruited online (n=149). Relationships among frequency of cannabis use, first method of regular use (at least weekly for a month), the number of methods used regularly, latency between initiating use and escalation to regular use, and problematic cannabis use (CUDIT-R) were assessed.
Results: Smoking as the first method of regular use was the most frequently reported method (65.8%), followed by vaping (26.8%) and edibles (7.4%). Most participants regularly used only one method (55.7%), with 36.9% and 7.4% reporting two and three methods, respectively. The median latency between initiation and escalation to regular use was 12 months (IQR=3,27). Latency from initiation of a second method to regular use was 15 months (IQR=2,26). Latency between regular use of a first and second method of use was 4-months (IQR = 1,16). Latency between initiation and regular use did not differ by type of method of regular use (p=.24). However, reporting that smoking was the first method of regular use related to more frequent and problematic use relative to vaping (p's<.05, d's=.46-.5) or edibles (p's<.05, d's=.89-.91).
Conclusions: Initiating regular cannabis use by smoking predicted more frequent and problematic use. Unexpectedly, the latency between initiation and regular use did not differ between methods or predict more frequent or problematic cannabis use. Replication and studies with larger sample sizes are needed to better understand heterogeneous and emerging cannabis use patterns and their relationship to cannabis-related harms.

M22. Demographic and Behavioral Correlates of Sex While High on Marijuana Among Gay and Bisexual Men; A Cross-Sectional Online Pilot Study

Simon Sandh[*1], Mirtala Sanchez[1], Kewanda Collier[2], Emily Goldmann[1], Melody Goodman[1], Danielle Ompad[1]*
[1]New York University School of Global Public Health, [2]Morgan State University
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: To examine correlates of sex while high on marijuana between gay and bisexual men
Methods: From May to November 2020, 127 gay and bisexual men completed a cross-sectional online survey about marijuana use. Participants resided in the United States or its territories, were aged 18+, and used marijuana in the last 3 months. We assessed associations between sexual orientation (bisexual vs. gay) and sex while high on marijuana in the last 3 months using logistic regression.
Results: The sample consisted of 80 gay men (63%) and 47 bisexual men (37%). Approximately 49% had sex while high on marijuana. Median age was 33 (IQR:18, 78); 89% were non-Hispanic; 88% were white; 32% had some college education; 31% reported income of $100,000+; 86% had not been on preexposure prophylaxis (PrEP); 70% had condomless sex in the last 3 months; and 48% used marijuana daily . Bivariate associations indicated significant (p<0.05) differences between having sex while high on marijuana and race , education, income, condomless sex, and marijuana use frequency. Unadjusted associations indicated bisexual men had greater odds of having sex while high on marijuana (OR:2.65; 95%CI:1.26-5.57). Controlling for age, ethnicity, race, education, income, condomless sex, and marijuana frequency, there were no significant differences in having sex while high on marijuana (AOR:2.07; 95%CI:0.59-7.58) by sexual orientation. Sex while high on marijuana

was significantly associated with condomless sex (AOR:6.99; 95%CI:1.80-27.14) and daily marijuana use (AOR:3.76; 95% CI:1.11-12.70) compared to those using 1-3 day a month.
Conclusions: There were no significant differences in sex while high on marijuana among gay vs. bisexual men. Findings highlight the relationship between different risky sexual behaviors namely condom use and sex while high on marijuana. While the small sample size is a limitation in this study, the intersection of marijuana use and risky sexual behavior among sexual minority men warrants further investigation.

M23. Change in Marijuana Use and its Associating Factors Among Persons Living With HIV (PLWH) During the COVID-19 Pandemic

Yan Wang[1], Gladys Ibanez[2], Krishna Vaddiparti[1], Nichole Stetten[1], Ruba Sajdeya[1], Eric Porges[1], Ronald Cohen[1], Robert Cook[1]*
[1]University of Florida, [2]Florida International University
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: To investigate how marijuana use changed in a cohort of persons living with HIV (PLWH) under the COVID-19 pandemic, and to determine whether the changes were associated with baseline characteristics, changes in physical and mental health during the pandemic, and perceived risks/benefits associated with marijuana use during the pandemic.
Methods: As part of an ongoing cohort study on marijuana and its long-term effects on physical and cognitive functioning among PLWH, 222 adults living with HIV (mean age = 50.2±11.2, 50.9% female, 14.5% Hispanic, 64.7% Black, 15.8% White, 5% other, 80.2% regular marijuana user, 19.8% non-users) completed a baseline survey on demographics and various behavioral and health characteristics between 2018 and 2019, and a brief phone survey on change in marijuana use, physical and mental health, and perceived risks/benefits of marijuana use during the COVID-19 pandemic (between June and October 2020).
Results: During the pandemic, 64 (28.8%) of the 222 participants reported increased marijuana use (quantity/frequency), 36 (16.2%) reported decreased use, and 122 reported no change. Results from a multinomial logistic regression model indicated that PLWH were more likely to increase marijuana use during the pandemic if they were more frequent marijuana users or had PTSD symptoms at baseline, if they reported that their mental health worsened during the pandemic, and if they did not perceive that marijuana use would increase the risk of COVID-19 infection. Frequent marijuana use at baseline was the only factor significantly associated with decreased marijuana use during the pandemic.
Conclusions: The COVID-19 pandemic has resulted in changes in marijuana use among a considerable proportion (45%) of PLWH in this study. Qualitative research is needed to understand the temporality of the increases in marijuana use with the worsening mental health, and/or research to understand whether marijuana is or is not associated with worse COVID-related outcomes.

Virtual Poster Q&A Session I: Human

M24. An Epidemiologic Profile of Substance Use Among Men who Have Sex With Men in Mexico

Angel Algarin[1], Marisol Valenzuela Laura[2], Ricardo Baruch-Dominguez[3], Steffanie Strathdee[1], Laramie Smith[1]*
[1]University of California San Diego, [2]Emory University, [3]International Planned Parenthood Federation
Abstract Detail Human
Select Drug Category Other, Injection and non-injection substance use
Topic Epidemiology
Abstract Category Original Research
Aim: To create an epidemiologic profile of substance use prevalence among a nationally recruited sample of men who have sex with men (MSM) in Mexico.
Methods: We analyzed data collected by the Es Entre Hombres study on 15,889 MSM living in Mexico between May-June 2017. We collected data on injection/non-injection substance use during participants' lifetime and past 12 months. Chi-square tests were used to assess associations between substance use outcomes by age, education, and geographical region.

Results: Most participants were ≤ 29 years of age (65.8%), had a bachelor's degree or greater (64.8%), and lived in Mexico City and surrounding metropolitan areas (34.2%). 1.1% reported ever injecting drugs, with the majority reporting methamphetamine (19.3%) followed by heroin (15.7%) use. 32.7% reported using non-injection substances in the past 12 months, where the most frequently used was marijuana (82.3%), amyl nitrates(poppers) (37.3%) and cocaine (21.1%). Higher education was significantly associated with history of injecting drugs (p=0.048). Recent non-injection substance use differed by age (p<0.001) and geographical region (p<0.001), where those aged 18-24 (40.4%) and in Mexico City and surrounding metropolitan area (38.8%) comprised the largest proportion of those who used non-injection substances in the past year.
Conclusions: In comparison to previous national estimate of past year substance use among MSM in Mexico, our sample had higher rates (25.4% vs 32.7%) highlighting growing disparities. Sustainable policies and resource allocations should be considered to reduce substance-related harms among MSM in Mexico.

M25. Supplemental Impact of Nurse-Led Community Health Worker Intervention on Improving Substance Use Among Homeless With Latent TB in Los Angeles

Adey Nyamathi[*1], Kartik Yadav[1], Benissa Salem[2], Sanghyuk Shin[1], Kathryn White[3], Alicia H. Chang[4], Lillian Gelberg[5], Donald Morisky[2]*
[1]UCI Sue & Bill Gross School of Nursing, [2]University of California, Los Angeles, [3]Los Angeles Christian Health Center, [4]Los Angeles County TB Control Program, [5]David Geffen School of Medicine at UCLA
Abstract Detail Human
Select Drug Category Other, methamphetamine / marijuana / amphetamine
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Homeless adults experience challenges in completing latent TB infection (LTBI) treatment due to substance use, mental health issues, and unstable housing. While we found the 3-month nurse-led-Community Health Worker (RN-CHW) model to be quite effective in resulting in a 92% completion rate among LTBI positive persons experiencing homelessness as compared with a 65% historical control comparison group, findings indicated that change in substance use had no impact. The purpose of this presentation was to assess the actual impact of the LTBI intervention specifically on substance use.
Methods: Utilizing a Health Seeking and Coping Paradigm, we developed and pilot tested an innovative, community-based directly observed intervention, including delivery of the 12-dose therapy (3HP; rifapentine [RPT] plus isoniazid [INH]) weekly as well as discussions on the importance of reducing substance use. Assessments occurred at baseline, and 3 and 6 months.
Results: Among the 50 enrolled participants, 39 were men and 11 were women; average age was 53 (SD=12.38). The sample was primarily Black (50%) or Hispanic (41.3%). Among the sample, 15% endorsed mild/moderate or severe substance use disorder (SUD). Findings revealed significant and ongoing decreases in any drug use (P = .004), amphetamine use (p = .029), marijuana use (p = .001) and methamphetamine use (p = .031) at six month follow-up.
Conclusions: The RN-CHW model was successful in decreasing serious drug use among homeless participants enrolled. After further testing with larger samples, consideration of policy development to promote innovative models, which directly address social determinants of health, are critical for promoting the health of extremely vulnerable groups.

M26. Cortisol and Stress Response to the Trier Social Stress Task is Attenuated in Those With Cocaine Use Disorder as Compared to Other Use Disorders

Nathaniel Baker[*1], Brian Neelon[1], Viswanathan Ramakrishnan[1], Kevin Gray[1], Michael Saladin[1], Constance Guille[1], Kathleen Brady[1], Aimee McRae-Clark[1]*
[1]Medical University of South Carolina
Abstract Detail Human
Select Drug Category Other, Cocaine, Cannabis, Opioid and Nicotine
Topic Substance Use Disorder
Abstract Category Original Research
Aim: The aim of this study is to examine differences in hypothalamic-pituitary-adrenal (HPA) axis response to a laboratory stressor among men and women with Substance Use Disorders (SUDs) and the effect of sex on these

differences. Altered stress-related responses due to repeated substance use may contribute further to addiction and relapse.
Methods: The Trier Social Stress Task (TSST) was administered to substance using males and females (n=418) across seven studies (cocaine n=144, opioid n=41, cannabis n=89, nicotine n=144). Salivary cortisol and subjective stress were measured prior to the TSST as well as at multiple follow-up time points (0-80 minutes). Stress measurement scales varied across studies but were standardized to a 0-10 scale. Generalized linear mixed effects models were developed to determine differences between primary substances of abuse and sex on response to the TSST.
Results: Participants in cocaine studies had significantly lower cortisol and subjective stress response to the TSST as compared to those in opioid, cannabis, and nicotine studies ($p<0.01$). Overall, female participants had significantly lower measured cortisol in response to the TSST as compared to males (Males-Females: $\Delta=0.094$; 95% CI: 0.054,0.134) but greater stress response ($\Delta=0.71$; 95% CI: 0.34,1.07). Stratification by sex across substances showed that females had consistently lower measured cortisol and higher subjective stress in response to TSST than men: Cocaine (Male-Female: Cortisol, $\Delta=0.096$; stress, $\Delta=-0.77$), nicotine (cortisol, $\Delta=0.098$; stress, $\Delta=-0.94$), cannabis (cortisol, $\Delta=0.080$; stress, $\Delta=-0.22$), and opioids (cortisol, $\Delta=0.081$; stress, $\Delta=-0.97$).
Conclusions: Cortisol and stress response to the TSST is significantly attenuated in those with cocaine use disorder, compared to other SUDs. It is unclear if altered HPA axis is a function of cocaine use or if altered HPA axis in response to stress increases the risk for cocaine use disorder. Sex differences exist with consistent differences across substances and may have implications for targeted sex specific treatment interventions.

M27. Examining Trends in Drug-Related and Other Arrests Over Time in the U.S.

Erin Annunziato[*1], Pia Mauro[2]*
[1]Columbia Mailman School of Public Health, [2]Columbia University
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Epidemiology
Abstract Category Original Research
Aim: Progressive cannabis policies aim to reduce drug-related arrests and racial disparities perpetuated by racial bias and policing practices. Previous research suggests policy effects vary by state. Plunk et al (2019) found marijuana legalization generally reduced adult but not youth marijuana arrest rates. State-level variations may be explained by policy detail, socio-political context, and crime data reporting gaps.
Methods: A longitudinal dataset was compiled from publicly available cross-sectional UCR Data: Arrests by Age, Sex, and Race (ASR) 2000-2014 and 2016. State population counts were aggregated from US Census Bureau State Intercensal Population datasets. The total arrest rate and the drug-related arrest rate for each year and state were estimated by dividing total and drug-related arrest counts by state population totals multiplied by 100,000. The portion of drug-related arrest counts vs total arrest counts was calculated for each state and year.
Results: From 2000-2016, agencies in ASR covered 90% of state populations on average in 49 states and DC. The overall total arrest rate declined from 4440 arrests per 100,000 residents in 2000 to 3388 arrests per 100,000 residents in 2016, starting in 2011. The overall drug-related arrest rate did not change. The proportion of total arrests that were drug-related increased from 0.098 in 2000 to 0.128 in 2016 and varied substantially by state.
Conclusions: Total arrests declined overall while drug-related arrest rates remained constant, suggesting structural processes specific to drug-related arrests are different than those impacting other types of arrests. Heterogeneity of drug-related arrest proportion trends between states indicates these processes may vary by state. Next steps include estimating longitudinal changes in total and drug-related arrests by race, age, and sex.

M28. Program Ownership and Comprehensive Service Provision Among Medicaid-Accepting Intensive Outpatient Treatment Programs in the United States

Edward Liebmann[*1]*
[1]VA Connecticut Healthcare, Yale Medical School
Abstract Detail Human
Select Drug Category Other, All substances
Topic Treatment
Abstract Category Original Research

Aim: Medicaid expansion increased national utilization of intensive outpatient programs (IOPs) for substance use disorders. Medicaid recipients are more likely to be impoverished and present with psychiatric and medical morbidity than the privately insured. However, IOPs are heterogenous with regard to their provision of comprehensive services and effectiveness. This study aims to characterize heterogeneity in the services offered by Medicaid-accepting IOPs and to assess the influence of program ownership on patterns of service provision.
Methods: Data on Medicaid-accepting IOPs (n = 3,769) in the 2018 National Survey of Substance Abuse Treatment were used for Latent Class Analysis (LCA). Twenty-one services were selected as LCA indicators spanning SUD assessment/treatment, retention/continuity-of-care promotion, social services, pharmacotherapy, family services, psychiatric services, medical services and adjunctive therapies. Predictors of class-membership were assessed using multinomial logistic regression. Facility-level predictors included ownership (for-profit, nonprofit, public) and other factors. State-level predictors included indices of service need, resource availability and government policy and were gathered from multiple national data sources.
Results: A 3-class model provided optimal fit: >= 50% likelihood of providing SUD assessment and education (SUD-A&E), social, retention/continuity-of-care, medical, psychiatric services (Comprehensive; 25.1%); >= 50% likelihood of SUD-A&E and social services only (Social Services; 44.6%); and, >= 50% likelihood of SUD-A&E only (Limited; 30.2%). In the adjusted regression model, publicly funded facilities (AOR= 4.14, p<.001) and nonprofit facilities (AOR= 1.65, p<.001) were more likely to belong to the Comprehensive class than the Limited class.
Conclusions: Three-quarters of IOPs were unlikely to provide medical services or pharmacotherapy and 30% of programs were unlikely to provide medical services, pharmacotherapy or core social services. For-profit IOPs were associated with limited service provision independent of state and facility-level factors, suggesting that ownership may be a critical moderator of potential effects of expanded IOP service utilization on national substance use and public health outcomes.

M29. Kratom (Mitragyna Speciosa) in the Context of Polydrug Use Among Adults: Findings From an International Survey & Qualitative Social Media Analyses

Oliver Grundmann[1], Kirsten Smith[2], Jeffrey Rogers[2], Destiny Schriefer[2], Diana Morcos[3], David Knightes[3], Charles Veltri[3], Eduardo Cinosi[4], Ornella Corazza[4], Giovanni Martinotti[5], Darshan Singh Mahinder Singh Singh[6], Marc Swogger[7], Zachary Walsh[8]*
[1]University of Florida, [2]National Institute on Drug Abuse, Intramural Research Program, [3]Midwestern University, College of Pharmacy, [4]University of Hertfordshire, [5]University G.d'Annunzio Chieti-Pescara, [6]Centre for Drug Research, Universiti Sains Malaysia, [7]University of Rochester Medical Center, [8]University of British Columbia
Abstract Detail Human
Select Drug Category Other, New Psychoactive Drugs
Topic Substance Use Disorder
Abstract Category Original Research
Aim: To determine correlates of Kratom use with concomitant drug use among an international sample of Kratom-using adults.
Methods: An anonymous online survey was conducted among current Kratom users from 34 countries between July 2019-2020. For this period, Reddit data pertaining to Kratom were also collected. A sample (17%) of posts (N=1,608) were analyzed. Reoccurring themes were identified and coded by two independent raters.
Results: A total of 5,152 participants completed the survey. A majority were male (54%), between the ages of 31-50 years (52%), married/partnered (60%), white (92%), and employed (65%). Nineteen percent had previously sought treatment for substance use disorder (SUD) and 25% were currently co-using Kratom with at least one other substance. SUD treatment was sought for fentanyl and other synthetic opioids (19%), methadone or buprenorphine (17%), and benzodiazepines (14%). Kratom was primarily used concomitantly with cannabis (26%), cannabidiol (CBD) oil (24%), and benzodiazepines (10%). A majority used Kratom to self-treat pain (74%) and psychiatric symptoms (59%), while 18% consumed it to mitigate, enhance, or reduce concomitant use/misuse of another substance. For social media analyses, 9 themes and 10 subthemes were identified, many supporting survey findings. These included: Kratom polydrug use and misuse; Kratom co-use with other substances to improve quality of life and mitigate SUD, psychiatric, or pain symptoms; and using Kratom to substitute addictive drugs. However, themes of Kratom tolerance, dependence, and withdrawal ranging from mild-moderate severity were also identified.

Conclusions: Kratom consumption appears to be associated with concomitant recreational drug use and with informal self-treatment for a range of health disorders. The perceived impact on health seems to be generally positive for most, though some report issues of dependence.

M30. Non-Injection Drug Use as a Correlate of Sexual Risk Behavior Among People Who Inject Drugs in Enrolled in the HPTN 037 Network-Randomized Study

Hilary Aroke[1], Natallia Katenka[1], Ravi Upadhyay[1], Ashley Buchanan[1]*
[1]University of Rhode Island

Abstract Detail Human
Select Drug Category Other, Substance use disorder, injection and sexual HIV risk behaviors
Topic Harm Reduction
Abstract Category Original Research

Aim: To examine the association between non-injection drug use (NIDU) and sexual risk behaviors among people who inject drugs (PWID) in Philadelphia, PA.
Methods: 232 unique injection risk networks in Philadelphia were randomized to a peer education intervention or control condition. The intervention aimed to reduce injection-related and sexual risk behaviors. Study participants reported use of oral ingestion or inhalation of crack or powder cocaine, opiates, and benzodiazepines and the outcome was any participant-reported unsafe sexual practices (unprotected sex with a non-primary partner, transactional sex, or multiple sex partners). All risk behaviors were measured at baseline and at 6-months intervals up to 30 months. Multilevel logistic regression model was used to estimate adjusted odds ratios (OR) and 95% confidence intervals (CI) and account for repeated measurements within individual and clustering within networks, adjusting for demographic characteristics, treatment assignment, index status, alcohol use and injection risk behaviors.
Results: Of 696 subjects included in the analysis, mean age was 40.5 years, 69% were male, and 45% were white. At baseline, 16% reported no NIDU, 34% reported one drug, and 50% reported ≥ 2 drugs. Reductions in NIDU and risky sexual practices were observed in both intervention and control arms during follow-up. Multivariable regression analysis showed that multiple NIDU (OR=2.57; 95% CI: 1.87-3.53), heavy alcohol use (OR=1.94; 95% CI: 1.44-2.62), injection-related risk behavior (OR=2.27; 95% CI: 1.68-3.07); marital status (OR=2.53; 95% CI: 1.69-3.77); and homelessness (OR=1.57; 95% CI: 1.14-2.14) were associated with reported risky sexual behavior. Treatment assignment and index status did not affect sexual risk behavior significantly (OR=0.88, 95% CI 0.64-1.20; OR= 1.20, 95% CI 0.89-1.60, respectively).
Conclusions: After controlling for the effects of the intervention, index status, and other risk behaviors, NIDU was correlated with increased sexual risk behaviors among PWID. Interventions addressing NIDU may have the potential to further mitigate HIV-related risk behavior.

M31. Recruitment Into a Clinical Trial of People Living With Uncontrolled HIV Infection who Inject Drugs: A Site Case Report From the CTN 67 Choices Study

Hansel Tookes[1], Jessica Ucha[1], Allan Rodriguez[2], Edward Suarez[1], Elizabeth Alonso[1], Lisa Metsch[3], Daniel Feaster[1], Tyler Bartholomew[1], Kim Hoffman[4], P. Todd Korthuis[4]*
[1]University of Miami Miller School of Medicine, [2]University of Miami, [3]Columbia University, [4]Oregon Health & Science University

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Objective: CTN-67 Comparing Treatments for HIV-Infected Opioid Users in an Integrated Care Effectiveness Study (CHOICES) was an open-label, randomized, comparative effectiveness trial of office-based extended-release naltrexone versus treatment as usual in people with untreated opioid use disorder and HIV. Herein we explore facilitators to recruitment in Miami, a successful recruiting site in the national trial.
Methods: Method: We conducted a mixed-methods study to explore the Miami site's success with recruitment including quantitative surveys of randomized participants, medical record abstraction and qualitative interviews with study staff.
Results: Results: Miami recruited 47 (40.5%) of 116 randomized participants in the six-site national trial. Most participants were homeless (66%) and 36% were not engaged in HIV care at enrollment. In-depth interviews of

study staff (n=6) revealed that Miami had a tailored, two-pronged recruitment approach consisting of street level outreach and a close relationship with the local syringe services program (SSP).
Conclusions: Conclusions: Partnership with a local SSP provided access to a large population of people living with HIV who inject drugs in Miami. SSPs' fundamental trust within the community of people who inject drugs can be leveraged in studies aiming to improve health outcomes in this underserved and high priority population.

M32. Cannabis Use, Comorbidities, and Polypharmacy Among Older Adults Receiving Care in a Large Urban Healthcare System 2019-2020

Marjan Javanbahkt[*1], Sae Takada[2], Whitney Akabike[2], Lillian Gelberg[2], Steve Shoptaw[2]*
[1]UCLA Fielding School of Public Health, [2]University of California, Los Angeles
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: To describe the prevalence of cannabis use and co-use with prescription medications among patients ≥50 years of age attending primary care (PC) clinics in a large urban healthcare system in Los Angeles, CA, after legalization of recreational cannabis use.
Methods: We used electronic health record (EHR) data from over 60 PC clinics of patients' ≥ 50 years of age who had an annual physical examination between July 2019 and May 2020. Cannabis use was assessed by clinical staff at the time of the visit. We also used EHR data on clinical characteristics including current prescriptions and comorbidities (ICD-10).
Results: 42,455 patients were included: median age 63 years (range: 50-101), 56% female; 66% identified as white/Caucasian, 10% Asian, 9% Hispanic/Latinx, and 5% black/African American. Current cannabis use was reported by 7.6% and higher than tobacco use (4.0%). Prevalence of cannabis use was higher among those with a current diagnosis of respiratory (9.1% vs. 7.6%; p value=0.03) or psychiatric condition (9.7% vs. 7.3%; p value<.01). Cannabis use was also higher among those prescribed inhaled short-acting beta agonists/anticholinergics (8.6% vs. 7.5%; p value<.01), benzodiazepines (10.9% vs. 7.3%; p value<.01), antiepileptics (13.6% vs. 7.6%), opioids (12.0% vs. 7.5%; p value<.01), or muscle relaxants (10.3% vs. 7.5%; p value<.01). After adjusting for age, sex, race/ethnicity, and comorbidities (Charlson Comorbidity Index), those prescribed medications for psychiatric (adjusted OR=1.5; 95% CI 1.4-1.7), respiratory (adjusted OR=1.2; 95% CI 1.1-1.3), or neurologic conditions (adjusted OR=1.4; 95% CI 1.2-1.5) had increased odds of cannabis use compared to those not prescribed these medications.
Conclusions: The prevalence of cannabis use among older adults in PC is high and higher among those prescribed medications which may interact with cannabis. Older patients may benefit from routine PC screening for cannabis use and brief advice regarding cannabis use and other prescription medications.

M33. Eyes on the Prize: Life Goals in People With and Without Substance Use Disorder, as a Function of Current Interest in Recovery

Jeffrey Rogers[*1], Kirsten Smith[1], Justin Strickland[2], David Epstein[1]*
[1]National Institute on Drug Abuse, Intramural Research Program, [2]Johns Hopkins University School of Medicine
Abstract Detail Human
Select Drug Category Other, Alcohol, Opioids, & Stimulants (separately, not necessarily polydrug use)
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Goal setting, proximal and distal, is a mainstay of formal treatment for substance use disorder (SUD) and may be a factor in natural recovery (and protection against transition to an SUD). In substance-using adults, we examined free-text responses to the question "Please describe in a few short sentences what you currently consider to be your most important life goal." We had included the question in an online survey partly to check that respondents were human and attentive, but it also comported with our larger aims—to examine drug use in the context of social belongingness.
Methods: Participants were US adults who either used only alcohol or who used opioids and/or stimulants (mostly but not only nonmedically), recruited via Amazon Mechanical Turk. Examining their free-text responses, we identified eight categories of life goals which were arranged into a thematic code system. Other item responses were used to categorize participants as having met DSM-5 SUD criteria (or not) in the past 12 months, and, for

those who did, categorizing them into "in recovery," "interested in recovery," or "not interested in recovery." We used, $\chi 2$ analysis for cross-tabulations.
Results: From September to December 2020, we collected 1,670 responses, of which 1,510 passed quality checks for analysis. Overall, people meeting SUD criteria and identified as being in (or interested in) recovery were less likely to report leisure/recreation goals ($\chi 2(3)=87.8$) and more likely to report abstinence/reduction goals ($\chi 2(3)=14.69$) than those not meeting SUD criteria or those uninterested in recovery. There were no such differences in the likelihood of goals involving self-improvement, family/relationships, volunteering, material possessions, religion/spirituality, or general happiness/satisfaction.
Conclusions: For most life-goal categories, people did not substantially differ by SUD or recovery-interest status, though recovery interest was accompanied by a relative unlikelihood of leisure-related life goals.

M34. Efficacy of an Automated Conversational Agent for Reducing Substance Use During the COVID-19 Pandemic: A Randomized Controlled Trial

Judith Prochaska[*1], Erin Vogel[1], Amy Chieng[1], Michael Baiocchi[2], Sarah Parajito[3], Ken Weingardt[3], Athena Robinson[3]*
[1]Stanford University Stanford Prevention Research Center, [2]Stanford University Epidemiology and Population Health, [3]Woebot Labs
Abstract Detail Human
Select Drug Category Other, Substance Use - General
Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: The COVID-19 pandemic disrupted access to treatment for substance use disorders (SUDs), while alcohol and cannabis sales increased. We tested a tailored digital health solution, Woebot-SUDs (W-SUDs), for reducing problematic substance use during the pandemic.
Methods: In a randomized trial, we compared W-SUDs to a waitlist control. US adults (N=180, age M=40+12, 65% female, 68% non-Hispanic white) with problematic substance use (CAGE-AID>1) enrolled June–August 2020. Most (77%) reported alcohol problems, 28% cannabis, and 45% multiple substances. Conditions were balanced on baseline measures except the waitlist screened higher on the CAGE-AID. Primary outcome was sum of past-month alcohol and drug use days at baseline and end of treatment (EOT). Secondary outcomes were craving intensity, confidence to resist cravings, Short Inventory of Problems–Alcohol+Drugs (SIP-AD), and depression symptoms (PHQ-8). Study retention was 83%.
Results: At baseline, the sample averaged 14+11 days of alcohol and 16+18 days of drug use in the past month; confidence of 59%+23% (R:0-100%); and SIP-AD of 12+11 (R:0-45); 47% reported moderate-to-extreme craving; and 46% moderate-to-severe depression. Over the 8-week intervention, treatment participants averaged 747+646 in-app text messages, rated completed lessons 96% positively, and 82% would recommend W-SUDs. Generalized estimating equations tested group differences in baseline-to-EOT change scores, adjusting for CAGE-AID. Relative to waitlist, the treatment group significantly reduced past-month substance use occasions (Mchange=-9.2[SD=1.9] vs. -3.6[SD=1.8]) and increased confidence (Mchange=+14%[SD=3] vs. +4.5%[SD=3]), p's<.05. Moderate-to-extreme craving significantly decreased for treatment (44% to 19%) but not waitlist (43% to 30%) participants (McNemar:p<.001). Treatment group improvements in substance use, confidence, and cravings correlated with SIP-AD and PHQ-8 improvements (r's=0.32–0.63, p's<.05).
Conclusions: W-SUDs was associated with significant reductions in substance use occasions and craving intensity and significant increases in confidence to resist cravings, which were associated with reduced SUDs problems and depressive symptoms. Retention was excellent. W-SUDs satisfaction was high.

M35. Insight-Craving Association Among Patients Initiating Addiction Treatment: An EMA Study

Laura Lambert[*1], Marie Riquier[1], Bérangère Thirioux[2], Nematollah Jaafari[2], Marc Auriacombe[1], Fuschia Serre[1]*
[1]University of Bordeaux, [2]Université de Poitiers
Abstract Detail Human
Select Drug Category Other, Substance and/or Behaviour
Topic Other
Abstract Category Original Research

Aim: Craving, an intense fluctuating desire to use, is a major risk factor for relapse. Because craving is an individual experience, capacity to report craving could be influenced by insight level. Low insight is defined as poor recognition of one's mental illness, disability to self-evaluate symptom severity, linked to less memory capacities, and has been reported as common in addiction. Studies suggest that low clinical insight could be linked to more rapid relapse, but association with craving remains unknown. Our aim was to examine the link between insight level and craving among patients beginning addiction treatment.
Methods: Participants initiating outpatient treatment for substance use disorder (DSM-5) completed a two weeks EMA study. Patients described craving intensity both in real-time (EMA) and retrospectively over past month at inclusion and insight level with modified Hanil Alcohol Insight Scale (m-HAIS). Data were analysed using Hierarchical Linear and non-linear Modeling (HLM) Program and Spearman tests.
Results: Preliminary results show that lower insight level was found associated with higher craving intensity in EMA (n=8; b=-0.30; p=0.008) and would have less consistency between EMA and retrospective craving (n=8; ρ=0.683; p=0.068).
Conclusions: This study shows that lower insight could be associated with higher craving but lower ability to report it retrospectively. That highlights the advantage of ambulatory assessments to explore individual experiences such as craving. Future studies should explore the role of cognitive deficits in discrepancy between current and retrospective assessment.

M36. Prevalence of Substance Use Across Parental Groups: Results From a Community Sample of Men

Laura Gonzalez Paz[*1], Linda Cottler[1]*
[1]University of Florida
Abstract Detail Human
Select Drug Category Other, opioids, marijuana, cigarettes, and alcohol (all independent use)
Topic Epidemiology
Abstract Category Original Research
Aim: Differences in prevalence of substance use across parental groups of women have been found; little attention has focused on men's parental status and substance use. Our aim was to examine differences in opioid, marijuana, cigarette, and risky alcohol use among men by parental status (those with a child <1 year of age (YOA), with children 1-18 YOA. and childless men). We hypothesized childless men would have the highest rates of substance use.
Methods: Community Health Workers from HealthStreet, a community engagement program at UF, assessed medical history and social determinants (age, education, race, ethnicity, number and age of children, and substance use) from community members. For opioids, marijuana, and tobacco use, men were classified as never users, lifetime users (no past 30-day use (P30D)) or P30D users. Only P30D risky alcohol use was assessed. Our sample included 3,008 men 18 to 77 YOA; the majority was Black (59.5%).
Results: Significant differences (p-value <.05) were observed across parental groups for all variables except for risky alcohol use (range: 29.7-32.3%). Rates of use of these substances were substantially high, though childless men reported the lowest rates of P30D marijuana and cigarette use (24.4% and 37.6%). Fathers with a child <1 YOA had the lowest rate of P30D opioid use (5.3%). P30D opioid and cigarette use was most prevalent in fathers with children 1-18 YOA (12.6 % and 48.3% respectively); P30D marijuana use was most prevalent among fathers with a child <1 YOA (37.3%).
Conclusions: Contrary to our hypothesis, men with children had higher rates than childless men. Drug use among fathers was alarming, especially for tobacco where secondhand smoke could affect children. While more research is needed, we show a need for clinicians to ask men about their use of substances including cigarettes; they also show a substantial need for education about smoking cessation.

M37. Implementing Screening, Brief Intervention and Referral to Treatment (SBIRT) for Drug Use in FQHC Primary Care Clinics in the COVID-19 Era

Lillian Gelberg[*1], Geoffrey Curran[2], Stephanie Sumstine[1], Whitney Akabike[1], Efren Aguilar[1], Natalie Martinez[1], Quynh Vo[1], Dallas Swendeman[1]*
[1]University of California, Los Angeles, [2]University of Arkansas for Medical Sciences
Abstract Detail Human
Select Drug Category Other, Risky Drug Use

Topic Prevention
Abstract Category Original Research
Aim: The aim of this analysis is to inform how the QUIT-Mobile intervention will need to be adapted for optimal uptake and sustainability in primary care clinics during the COVID-19 era.
Methods: Weekly Community Advisory Board (CAB) meetings are held with clinic partners, including the clinic Chief Medical Officer, primary care providers (PCPs), and the clinic's IT manager. The CAB works collaboratively with the QUIT-Mobile team to adapt the full QUIT-Mobile protocol for telehealth and implementation. Researchers used thematic content analysis of team meeting notes using Dedoose to code for quality improvement, early clues of what QUIT-Mobile investigators and clinicians think about the protocol and how the team is adapting SBIRT for telehealth.
Results: Preliminary results include: 1) patients to self-administer computerized screeners, completed prior to patient routine visits, and drug use screening become part of the clinic's mandated pre-visit clinic screeners; 2) implementation implications of offering a Zoom option for health coaching sessions due to telehealth reimbursement currently only for telephone visits for FQHCs; 3) planning for a Medical Assistant to "hand" PCPs the Clinician Brief Advice Script and Intervention Plan, in lieu of an in-person research assistant, and exploring cost implications; 4) building in reimbursable screeners (i.e., ACES Aware) to make SUD screening scalable for clinic implementation; and 5) navigating validity of mail-based urine drug screening (UDS).
Conclusions: Findings from this analysis show the challenges inherent in shifting procedures to telehealth for patient visits, health education sessions, and mail-based UDS for risky drug users, while navigating clinic challenges during COVID-19. Next steps include qualitative semi-structured interviews with patients, providers, and clinic stakeholders to assess barriers and facilitators to implementation after study launch. If effective, this study will be integrated into routine primary care as part of behavioral health efforts following recommendations of the Affordable Care Act and the Mental Health Parity Act.

M38. Risk-Related Behaviors/Traits and Substance Use Among U.S. Army Reserve and National Guard Soldiers: The Role of Deployment

Mehreen Arif[*1], Rachel Hoopsick[1], D. Lynn Homish[1], Gregory Homish[1]*
[1]*State University of New York at Buffalo*

Abstract Detail Human
Select Drug Category Other, Alcohol and Illicit Drugs
Topic Drug Interactions
Abstract Category Original Research
Aim: U.S. Army Reserve/National Guard (USAR/NG) soldiers are at risk for substance use, and research in other populations suggests risk-related behaviors/traits affect the propensity for use. Less is known about how deployment might amplify these effects. We examined the relations between risk-related behaviors/traits and substance use among USAR/NG soldiers and differences by deployment.
Methods: We drew a subset (N = 343 soldiers) of data from Operation: SAFETY, an ongoing study of USAR/NG soldiers. Regression models examined the cross-sectional relations between domains of risk (i.e., risk perception, risk-taking/impulsivity, sensation-seeking) and substance use (any current drug use, current non-medical use of prescription drugs, current illicit drug use, alcohol problems, frequent heavy drinking [FHD]), separately. Final models controlled for age, sex, anger, and PTSD. We added an interaction term to final models to examine if these relations differed according to deployment status (never deployed vs. previously deployed).
Results: Greater risk-taking/impulsivity was associated with a higher likelihood of any current drug use ($p < 0.05$) and alcohol problems ($p < 0.01$). A trend-level interaction between risk-taking/impulsivity on any current drug use ($p < 0.10$) and a significant interaction between risk-taking/impulsivity on current illicit drug use ($p < 0.05$) showed that soldiers who exhibited high impulsivity and were previously deployed had the greatest likelihood of drug use. Greater risk perception was significantly associated with a lower likelihood of FHD ($p < 0.01$) and a lower likelihood of alcohol problems at a trend level ($p < 0.10$). Sensation-seeking was not associated with any outcome.
Conclusions: Findings demonstrate that greater risk-taking/impulsivity was associated with substance use, and greater risk perception was protective against alcohol misuse. Previously deployed soldiers with high impulsivity may be at greatest risk. Reducing impulsivity and other risk-related behaviors/traits may be critical in preventing substance use among USAR/NG soldiers – especially among those previously deployed.

M39. Engagement in Re-Entry Services Among a Population With Co-Occurring Substance Use and Mental Health Disorders in Massachusetts Jails

Paige Shaffer[1], Ayorkor Gaba[1], Lexi Williams[1], Gerardo Gonzalez[1], Smelson David[1]*
[1]*University of Massachusetts Medical School*

Abstract Detail Human
Select Drug Category Other, co-occurring mental health and all substance use disorders
Topic Treatment
Abstract Category Original Research

Aim: Co-occurring substance use and mental health disorders (COD) are common in the criminal justice (CJ) population. Individuals with a COD also have a higher risk for overdose as compared to individuals with SUD only, particularly during their transition from incarceration back into the community. Although targeted support during this vulnerable transition for individuals with COD is important, less is known about what type of intervention model or level of support is most engaging for this population. This study attempts to fill the gap by comparing the length of engagement of two interventions: (1) an intensive wraparound COD support model to a (2) a linkage only model.
Methods: 293 CJ involved clients in Massachusetts enrolled in either a COD wrapround intervention (n=173), or a linkage only model (n=120). Kaplan Meier Curves were compared for each treatment intervention, and Cox Proportional Hazards were computed to determine differences in length of engagement while controlling for individual level covariates at baseline.
Results: The test of equality over strata indicated that engagement was significantly different between interventions (X2=58.44, DF=1, p<.0001). Cox proportional Hazards indicated a 61.7% reduction in Hazard of early discharge for individuals receiving the COD wrapround intervention as compared to a linkage only model (p < .0001), controlling for all covariates (e.g., age, race/ethnicity, gender, number of arrests, length of CJ involvement, primary substance, and length of pre-release engagement).
Conclusions: Engagement in care was dramatically higher for individuals in a COD wraparound intervention compared to a linkage only model. These findings indicate that there is a need to identify client re-entry needs in advance of release, to increase COD treatment engagement post-release. Future research might even consider matching individuals to an intervention model that best suits their needs.

M40. PTSD Diagnosis and Nonmedical Use of Benzodiazepines: The Mitigating Effect of John Henryism Active Coping

Paris Wheeler[1], Brittany Miller-Roenigk[1], Shannon Johnson[1], Jasmine Jester[1], Danelle Stevens-Watkins[1]*
[1]*University of Kentucky*

Abstract Detail Human
Select Drug Category Other, Benzodiazepines
Topic Epidemiology
Abstract Category Original Research

Aim: Rates of hospitalizations and drug treatment admissions related to nonmedical use of benzodiazepines have risen significantly in recent years. Benzodiazepines are commonly misused among Black incarcerated men with a history of drug use, a population at increased risk for overdose post-release. Despite this, limited research examines correlates for nonmedical benzodiazepine use in this population. Of particular concern is high rates of PTSD among incarcerated men, which is known to exacerbate risk for drug use. However, benzodiazepine misuse may also be mitigated by John Henryism Active Coping (JHAC), a culturally relevant coping style that is protective against illicit drug use among Black men. The current study examined whether the relationship between PTSD and benzodiazepine misuse differs based on level of JHAC among Black incarcerated men.
Methods: Data were derived from Helping Incarcerated Men (HIM; K08DA DA032296; PI: Stevens-Watkins), a study of 208 Black incarcerated men nearing community re-entry. The primary outcome was nonmedical use of benzodiazepines in the 30 days before incarceration. Current PTSD diagnosis was determined using the Clinician Administered PTSD Assessment—5 (CAPS-5). JHAC was assessed utilizing the John Henryism Active Coping Scale.
Results: Preliminary results show misuse of benzodiazepines was significantly associated with current PTSD diagnosis [x2(1, N=208)=9.80, p=0.02]. When examining the conditional effect of JHAC, only participants who scored below the median level of JHAC showed a significant relationship between current PTSD and

benzodiazepine misuse (OR=4.31, p=0.01). Forthcoming analyses will control for socioeconomic factors which interact with JHAC to affect health outcomes.
Conclusions: Black incarcerated men with PTSD are at risk for misusing benzodiazepines primarily when their levels of John Henryism Active Coping are low, indicating a protective effect. JHAC may impact the effectiveness of dual diagnosis programming for incarcerated men nearing community reentry.

M41. Open Board

M42. Training Probation Officers to Deliver Contingency Management

Stacy Ryan-Pettes[1], Meghan Morrison[1], Jeff Randall[2], Phillippe B. Cunningham[2], Colleen Halliday-Boykins[2], David M. Ledgerwood[3]*
[1]Baylor University, [2]Medical University of South Carolina, [3]Wayne State University
Abstract Detail Human
Select Drug Category Other, training in EBTs
Topic Other
Abstract Category Original Research
Aim: Incentive-based contingency management (CM) is often used by juvenile probation departments, but few probation officers receive training about incentive-based CM or how to deliver it appropriately. To fill this gap, 23 probation officers (65.2% Female; 68.2% white; Mage = 42.7; SD = 10.23) from three juvenile probation departments received training.
Methods: Training included a didactics seminar (8 hours) and a training and supervision period. Probation officers completed a pre-training measure to assess their perceptions of using incentives to modify guardians of substance using youth behavior, a pre-and post-training measure of their knowledge of CM principles, and a quiz developed for this study. Finally, probation officers' adherence to CM was evaluated using the Contingency Management Competency Scale during role-plays immediately after the training and again during the trial.
Results: The three topmost frequently endorsed positive and objective opinions of CM among providers, as indicated by research, were also the topmost frequently endorsed item among probation officers. Probation officers performed near the cutoff (>=80%) for adequate performance (M = 76.1%; SD = .17) on the study specific CM quiz and knowledge of CM principles significantly improved pre-training (M = 65.2%, SD = .12) to post-training (M= 76.2%, SD = .14), t(22) = -2.98, p = .007. Adherence was considered acceptable immediately after training, M= 5.75, SD = .39. Among the eight probation officers who have also had participants in the trial, adherence to CM was maintained [t(7) = -1.51, p = .17] over a five month period, on average (SD = 1.55).
Conclusions: Preliminary data indicate that, with appropriate training, probation officers can improve in their knowledge of CM principles, can deliver CM with fidelity, and may be able to maintain adequate fidelity over time. These data also suggest probation officers may require support when applying knowledge of CM within the context of specific procedures.

M43. Identifying the Factors Associated With the Decision to Get Vaccinated Against COVID-19 Among Staff in a Large Opioid Use Disorder Program

Vinodini Kumaravelu[1], Lawrence Brown[1], Vinodini Kumaravelu[1], Alvin Chu[1], Anthony McLeod[1], Darren Zhang[1]*
[1]START Treatment & Recovery Centers
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Prevention
Abstract Category Original Research
Aim: To assess the factors associated with acceptance of COVID-19 vaccination among staff in a large urban program for the treatment of patients with opiate use disorder
Methods: A short survey consisting of demographic information and questions regarding various factors important in COVID-19 vaccine decision-making was administered to 265 staff (clinical and non-clinical) working in seven drug treatment facilities and management during a two-week period. The data will be analyzed using SPSS (version 26).
Results: Preliminary results suggest that less than 50% of the employees are receptive. Receptivity was associated with age and beliefs.

Conclusions: Successful vaccination programs will require tailoring to the differences among populations if they are to be successful, especially for health care providers at risk, partially because they provide care to communities of color and disadvantaged populations. Constructing such programs have benefits not only to them, but also to the patients they serve.

Virtual Poster Q&A Session I: Nicotine/Tobacco

M44. Association Between Smoking and Premenstrual Syndrome: A Meta-Analysis

Ajna Hamidovic[*1]*
[1]*University of Illinois*

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavior
Abstract Category Literature Review

Aim: Results of basic science studies demonstrate shared actions of endogenous neuroactive steroid hormones and drugs of abuse on neurotransmission. As such, premenstrual syndrome (PMS) may be associated with smoking, however, results from studies examining this relationship have been mixed. Following PRISMA guidelines, we extracted unique studies examining the relationship between smoking and PMS.
Methods (Optional): We used the escalc () function in R to compute the log odds ratios and corresponding sampling variance for each study. We based quality assessment on the nature of PMS diagnosis and smoking estimation, confounding adjustment, participation rate, and a priori specification of target population.
Results (Optional): Our final sample included 13 studies, involving 25,828 study participants. Smoking was associated with an increased risk for PMS [OR = 1.56 (95% CI: 1.25–1.93), $p < 0.0001$]. Stratified by diagnosis, the effect size estimate was higher for Premenstrual Dysphoric Disorder (PMDD) [OR = 3.15 (95% CI: 2.20–4.52), $p < 0.0001$] than for PMS [OR = 1.27 (95% CI: 1.16–1.39), $p < 0.0001$].
Conclusions: We review some of the basic mechanisms for the observed association between smoking and PMS. Given nicotine's rewarding effects, increased smoking behavior may be a mechanism to alleviate affective symptoms of PMS. However, smoking may lead to worsening of PMS symptoms because nicotine has effects on neurocircuitry that increases susceptibility to environmental stressors. Indeed, prior evidence shows that the hypothalamic-pituitary-adrenal (HPA) axis is already sub-optimal in PMS, hence, smoking likely further deteriorates it. Combined, this complicates the clinical course for the treatment of both PMS and Tobacco Use Disorder in this population.

M45. Cannabis Blunt Smoking and Initiation of Tobacco Products Among U.S. Youth and Young Adults

Brian Fairman[*1], Heather Kimmel[2], Carlos Blanco[2], Wilson Compton[2]*
[1]*University of Arkansas for Medical Sciences,* [2]*National Institute on Drug Abuse*

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Epidemiology
Abstract Category Original Research

Aim: Blunts are a common method of tobacco and cannabis co-use in the United States in which cannabis is rolled in a cigar shell. The extent to which blunt smoking influences the risk of trying other tobacco products is unclear. We estimated lifetime prevalence of blunt smoking among youth and if it was associated with future initiation of cigarettes, e-cigarettes, cigars, and cigarillos.
Methods: The study conducted longitudinal analysis of Waves 1-4 (2013-18) of the prospective, nationally representative Population Assessment of Tobacco and Health (PATH) Study. Participants were U.S. youth (ages 12-17) and young adults (age 18-24) at Wave 1 (n=15,549). The main outcomes were initiation of cigarettes, e-cigarettes, and cigars or cigarillos at Waves 2-4. The key explanatory variable was ever use of blunts, cannabis-only, or neither at Wave 1.
Results: Lifetime blunt smoking prevalence was 20.9% among 12-24-year-olds (7.7% among 12-17-year-olds, and 31.5% among 18-24-year-olds). Compared to those who did not use blunts or cannabis, youth and young adults who smoked blunts were more likely to initiate cigarettes (odds ratio, OR=1.7; 95% confidence interval (CI), [1.3, 2.4]), e-cigarettes (OR=1.6; 95% CI, [1.3, 2.0]), cigars or cigarillos (OR=1.7; 95% CI, [1.1, 2.5]), and

any three of these tobacco products (OR=2.8; 95% CI [1.9, 4.1]) after adjusting for other tobacco use, alcohol use, other drug use, living in a medical cannabis state, sex, age, and race/ethnicity. Youth and young adults who used cannabis-only were similarly more likely to initiate tobacco.
Conclusions: About 1 in 3 US young adults and 1 in 13 youth have smoked blunts, which are associated with an increased risk of initiating cigarettes, e-cigarettes, cigars, and cigarillos within 1-3 years.

M46. An Intervention to Support Implementation of Tobacco Policies in California Substance Use Treatment Programs

Caravella McCuistian[*1], Elana Straus[1], Thao Le[1], Kevin Delucchi[1], Joseph Guydish[1]*
[1]University of California, San Francisco
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Treatment
Abstract Category Original Research
Aim: Tobacco use prevalence among people who access substance use disorder (SUD) treatment is three times higher than that of the general population. California has addressed this disparity through the California Tobacco Control Program's Tobacco-Free for Recovery Initiative. This initiative included an intervention to support SUD treatment programs in designing policies to address tobacco use and implement tobacco-free grounds. The current study examined changes in smoking prevalence, tobacco use behaviors, and receipt of cessation services pre-post intervention.
Methods: Cross-sectional client survey data were collected from seven treatment programs at the start (n = 249) and the end (n = 219) of the 15-month intervention. All participants reported smoking status while current smokers reported on tobacco use behaviors and both current smokers and former smokers who quit in treatment reported on receipt of cessation services. Multivariate logistic regression assessed changes from pre- to post-intervention.
Results: Client smoking prevalence decreased from 54.2% at pre- to 26.6% at post-intervention (Adjusted Odds Ratio [AOR] = 0.22, 95% CI = 0.11, 0.44). Current smokers and former smokers who quit while in treatment reported an increase in receipt of NRT/pharmacotherapy (11.9% vs. 25.2%; AOR = 2.64, CI = 1.21, 5.77). Within the five programs that reported implementing tobacco-free grounds at the end of the intervention, clients and staff smoking together also decreased (20.4% vs. 8.5%; AOR = 0.25, CI = 0.07, 0.92). Other use behaviors and cessation services did not significantly change over time.
Conclusions: An individualized tobacco-free grounds policy intervention in residential SUD programs was associated with a significant reduction in client smoking and increased receipt of NRT/pharmacotherapy. Among programs that implemented tobacco free grounds, concurrent staff/client smoking decreased. These findings suggest that by providing programs with monetary support, education, and resources, SUD treatment programs developed an individualized policy that was associated with reduced client smoking prevalence.

M47. A Systematic Review of Interventions to Induce Attempts to Quit Tobacco Among Adults Not Ready to Quit

Elias Klemperer[*1], Joanna Streck[2], John Hughes[1], Nicola Lindson[3]*
[1]University of Vermont College of Medicine, [2]Massachusetts General Hospital/Harvard Medical School, [3]University of Oxford
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Treatment
Abstract Category Literature Review
Aim: The prevalence of past year cigarette smoking cessation remains below 10% in the US and most people who smoke are not ready (i.e., unwilling or unmotivated) to quit tobacco in the near future. Successful cessation requires both 1) initiating a quit attempt (QA) and 2) maintaining abstinence. Most treatment research has focused on achieving abstinence among people already motivated to quit. We systematically reviewed interventions to promote QAs among people not ready to quit tobacco.
Methods (Optional): We searched PubMed, CENTRAL, PsycINFO, Embase and personal libraries for randomized trials of harm reduction or tobacco cessation interventions that reported QAs among adults not ready to quit tobacco use. The 2,418 articles identified by our search were screened for eligibility by two independent

reviewers. We also extracted data from eligible studies in duplicate, with disagreements discussed with a third reviewer. Initial findings are summarized narratively.
Results (Optional): We identified 23 eligible trials that reported 33 tests of interventions to induce QAs among 7,342 adults not ready to quit tobacco at baseline. These tests investigated 10 different types of intervention. The most commonly tested were those to reduce tobacco use (n=9), smoking cessation medications (n=9), and counseling to increase motivation to quit (n=7). One intervention was for smokeless tobacco users and the rest targeted combustible cigarette smoking. Approximately one third (35%) of the included tests found a significant improvement in the proportion of participants who made a QA. However, no single intervention type appeared superior when results were examined across trials.
Conclusions: Relatively few trials have tested interventions to induce QAs in unmotivated participants, in comparison to those testing cessation interventions in motivated participants. These findings identify interventions that have been tested and suggest a need for future research to improve interventions to induce QAs among people not ready to quit tobacco.

M48. Secondhand Tobacco Smoke Exposure in Children: A Neglected Driver of Health Disparities and Social Injustice in Nigeria

Afolabi Oyapero[1], Olufemi Olagundoye*[1]
[1]Lagos State University College of Medicine
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Epidemiology
Abstract Category Original Research
Aim: The adverse effects of secondhand smoke (SHS) exposure has been reported in literature, but data on SHS exposure among children in Nigeria is virtually non-existent. We aimed to estimate the prevalence of SHS exposure to tobacco among school children in Nigeria and to assess its association with socio-demographic factors.
Methods: Data from three school-based descriptive studies in Lagos, Nigeria was utilized and socioeconomic characteristics and smoking behaviour in the households were obtained using validated questionnaires. Parental and relatives smoking habit were utilized as the indicators of SHS exposure. Prevalence rates were calculated, and chi-squared tests and logistic regression analysis were conducted to determine significant associations and 95% confidence intervals (CIs) were estimated.
Results: Within the preceding month, 37.6% of the children had been regularly exposed to SHS while 15.5% of them lived with parents and family members who smoked tobacco indoors of which 7.9% were daily exposed to SHS;19.7% of the children daily experienced cough, nasal congestion, throat, or eye irritation. In the Bivariate analysis, paternal education, type of accommodation and number of children in the family were associated with SHS exposure. In the regression analysis, the likelihood of SHS exposure were significantly higher in those with parents that smoke regularly (OR=2.62; 95% CI: 1.50–5.27; p=0.042), lower levels of paternal education (OR=1.7; 95% CI: 0.61–5.27; p=0.021) who live in cramped accommodations (OR=1.79; 95% CI: 1.02–5.67; p=0.044) and those from households with ≥5 children (OR=1.51; 95% CI: 0.90–2.56; p=0.003).
Conclusions: These observed significant association between parental smoking habits, paternal education, type of accommodation and number of children in the household on paternal smoking and SHS exposure in children. Tobacco control policies should emphasize protection of children through the adoption of smoke-free homes and increase parental awareness on the impact of SHS exposure on children.

M49. Pilot Feasibility Study of Contingency Management for Smoking Cessation Among Overweight and Obese Smokers

Gloria García-Fernández[1], Andrea Krotter[1], Ángel García-Pérez[1], Gema Aonso-Diego[1], Sara Weidberg[1], Irene Pericot-Valverde[2], Roberto Secades-Villa[1]
[1]University of Oviedo, Spain, [2]Clemson University
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Treatment
Abstract Category Original Research

Aim: Smoking rates are high among population with excess weight, and post-cessation weight gain is a barrier to quitting. Prior evidence showed that contingency management (CM) techniques are effective to reduce tobacco use. Nevertheless, there is a lack of research exploring the effectiveness of CM for overweight or obese smokers. Aims: 1) To assess the feasibility—in terms of recruitment, retention, and session attendance—and acceptability of smoking cessation treatments; 2) To examine the preliminary outcomes of tobacco abstinence and weight change.
Methods: A total of 16 smokers (Mage=52.31, SD=9.58, 62.5% males) were randomly assigned to one of the two following 8-week smoking conditions: 1) Cognitive-behavioral treatment (CBT) for gradual smoking cessation + a weight gain prevention module (WGP) for weight stability (n=7); 2) the same treatment alongside contingency management (CM) for tobacco abstinence (n=9). CM consisted of providing incentives contingent upon smoking abstinence verified biochemically (CO≤4ppm and cotinine≤80ng/ml). Participants could earn a maximum of 320€ ($388).
Results: Of all participants who were interested in the program, 21 met the inclusion criteria, and finally 16 began the treatment (76.19%). All participants completed the treatment in both conditions. The number of sessions attended was 12.42 (SD=3.25) in the CBT+WMP group and 14.66 (SD=.114) in the CBT+WGP+CM condition (p=.114). The mean satisfaction rating for the treatment as a whole at the end of treatment was 9.88 (SD = 0.332; 1–10 scale with 10 being most satisfactory). Preliminary efficacy data indicated that the CBT+WGP+CM group achieved higher abstinence compared with the CBT+WGP condition (100% vs. 42.85%, p=.042). Both groups did not significantly change their baseline weight (p≥.058).
Conclusions: Providing WGP and CM components within a standard smoking cessation intervention seems to be feasible and acceptable. Preliminary data indicated that including a CM component facilitates tobacco abstinence rates more than CBT+WGP alone does.

M50. Nicotine Salt Beliefs Among Tobacco Users

Tori Murray[1], Karen Soohoo[1], Paul Harrell[1]*
[1]Eastern Virginia Medical School
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Harm Reduction
Abstract Category Original Research
Aim: Youth Electronic Nicotine Delivery System (ENDS) use from 2017-2018 had the largest 1-year increase ever for any substance in many national surveys (e.g., MTF, NYTS), primarily due to Juul. Juul was unique as a nicotine salt (NS) product. As Juul flavors were restricted, Puff Bars avoided such regulations by selling disposable NS products; liquids sold separately are also allowed to include flavors. NS theoretically allow higher nicotine delivery without the perceived mouth and throat irritation (MATI) of high nicotine levels in non-NS ENDS. Despite the success of NS products, NS awareness is unclear. This study examined tobacco user awareness and beliefs related to NS to help guide potential regulations regarding these products.
Methods: U.S. tobacco users (daily or weekly) were recruited for an online survey via Amazon MTurk (N=718, 62.0% male, age M=34.25, SD=8.71, 90.8% ENDS ever-users, 73.8% ever-cigarette smokers). A majority used NS before (58.4%, 35.7% Juul, 27.7% Puff Bar, 19.8% NS liquids, 2.6% other). Beliefs were measured using MATI, a BSCQ-A expectancy item. Paired t-tests investigated expectancies between regular nicotine (RN) and NS for all respondents. Post-hoc comparisons examined RN versus NS for NS liquid users (N=142).
Results: Few (26.9%) reported understanding NS. NS liquid users (OR=2.20, 95%CI = 1.50-3.22), but not Juul users (OR=1.15, 95%CI=0.84-1.57), were more likely than never-users to report understanding NS. Among the full sample, MATI ratings did not significantly differ, p=.377. Among NS liquid users, MATI ratings differed between NS (M=45.82, SD=28.75) and RN (M=50.89, SD=28.67), p=.007, partial eta-squared = .050. There was a significant interaction between NS liquid usage and the type of nicotine on MATI ratings, F(1,716)=5.661, p=.018.
Conclusions: Tobacco users, with the exception of NS liquid users, largely appear unaware of NS and have beliefs seemingly contrary to leading chemical theories. Thus, NS labeling regulations may only impact NS liquid users.

M51. Pre-Implementation Assessment of Tobacco Cessation Interventions in Substance Use Disorder Residential Programs in California

J. Konadu Fokuo[1], Caravella McCuistian[2], Carmen Masson[2], Valerie Gruber[2], Elana Straus[2], Jessie Wong[2], Joseph Guydish[2]*
[1]*University of Illinois At Chicago,* [2]*University of California, San Francisco*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Treatment
Abstract Category Original Research
Aim: Smoking rates among clients in substance use disorder (SUD) treatment are higher than those of the general population. Guided by the Consolidated Framework for Implementation Research (CFIR), our objective with this study was to identify key factors that may influence the implementation of smoking cessation policy and services in residential SUD programs.
Methods: We conducted semi-structured qualitative interviews with sixteen residential program directors in California. The analysis was guided by a deductive approach using CFIR domains and constructs to develop codes and identify themes. ATLAS.ti software was used to facilitate thematic analysis of interview transcripts.
Results: Four CFIR domains were represented in the data with outer setting and inner setting domains most prominent as both barriers and facilitators. CFIR constructs that arose as facilitators included the relative advantage of the intervention compared with current practice (intervention characteristics), external policies and incentives to support tobacco-free grounds (outer setting), implementation climate compatible with smoking cessation interventions (inner setting), strong commitment to develop and implement smoking cessation policies (inner setting), self-efficacy to incorporate cessation interventions into SUD treatment curricula (individual characteristics), and recognizing the importance of planning and engaging opinion leaders and external change agents (process). Potential barriers included the addiction recovery culture (outer setting), organizational culture (inner setting), lack of expertise and workforce available to treat tobacco use disorder (inner setting), reimbursement systems for smoking cessation services not necessarily compatible with existing workflows and systems (inner setting), and not engaging all key stakeholders in policy-making (process).
Conclusions: Using the CFIR, this study further illuminates which adaptations may be needed to successfully integrate smoking cessation policies and services into publicly funded treatment programs. These findings highlight the need to support publicly funded SUD treatment programs to address tobacco use and dependence among their clients.

M52. The Acute Impact of Nicotine on Brain Network Dynamics in Non-Smokers

Kainan Wang[1], Kaelyn Brown[2], Roselinde Kaiser[3], Blaise Frederick[1], Lauren Moran[2], David Olson[2], Diego Pizzagalli[1], Amy Janes[1]*
[1]*McLean Hospital, Harvard Medical School,* [2]*McLean Hospital,* [3]*University of Colorado, Boulder*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research
Aim: Individuals with nicotine dependence show alterations in neurocognitive networks such as the default mode (DMN), salience (SN) and frontoparietal networks (FPN). One theory suggests that during abstinence, DMN-focused internal information processing dominates, while nicotine replacement induces the opposite effect resulting in greater external information processing supported by the SN and FPN. Whether acute nicotine impacts the dynamic functioning of these networks is still unknown and would provide insight into nicotine's acute influence on network function.
Methods: In a randomized double-blind crossover study, 17 healthy non-smokers (8 females) were administered placebo and nicotine (2-mg lozenge) prior to a 6-minute resting-state functional magnetic resonance imaging (fMRI) scan. We applied eight co-activation "states" previously defined in 462 individuals from the Human Connectome Project and computed state-specific dynamics including total time spent in state, persistence during each transition into state and frequency of transitions into state. Using repeated-measure ANOVAs, we examined how nicotine acutely alters resting-state dynamics.
Results: Following a significant interaction of visit by state ($F(7,112) = 1.73$, $p = 0.019$), post-hoc analyses determined that under nicotine relative to placebo, participants spent less time in a DMN-like state (posterior cingulate cortex, medial prefrontal cortex, insula, striatum and orbitofrontal cortex; $t(16) = -2.88$, $p = 0.043$) and

more time in a SN state (anterior cingulate cortex and insula, t(16) = 2.89, p = 0.043). No significant findings were observed for persistence and frequency.
Conclusions: Our findings show that nicotine acutely suppresses time spent in a DMN-like state and enhances time spent in a SN state, indicating that a single dose of nicotine influences the functioning of these networks in a manner corresponding to what has been noted in long-term nicotine-dependent individuals. These network changes suggest that nicotine biases brain function away from DMN-mediated functions, which may enhance externally focused attention.

M53. Pulmonary Inflammation in E-Cigarette Users, Cigarette Smokers, and Healthy Controls: A Preliminary Study Using [18F]NOS PET Lung Imaging

Reagan Wetherill[*1], Robert Doot[1], Heather Keyser[1], Anthony Young[1], Sharon Lee[1], Erin Schubert[1], Robert Mach[1], Jacob Dubroff[1]*
[1]University of Pennsylvania
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research
Aim: In the United States, the use of electronic cigarettes (e-cigarettes) has dramatically increased, particularly among youth and young adults. Research indicates that the aerosolization of e-liquids by e-cigarettes generates toxic compounds that, upon repeated inhalation, can cause lung inflammation, which has been implicated in the pathogenesis of many lung-related diseases including cancer and chronic obstructive pulmonary disease. To date, there is a paucity of human data on the respiratory health effects of vaping nicotine via e-cigarettes, particularly relative to that of cigarette smoke. [18F]NOS, a Positron Emission Tomography (PET) radiotracer that targets the inducible isoform of nitric oxide synthase, has been successfully used to measure cardiopulmonary inflammation in heart transplant rejection and LPS-induced lung injury. Thus, we aim to measure and compare pulmonary inflammation using [18F]NOS PET lung imaging and peripheral biomarkers of inflammation in e-cigarette users, cigarette smokers, and nonsmoking controls.
Methods: Fifteen demographically-matched subjects (5 e-cigarette users, 5 cigarette smokers, and 5 nonsmoking controls) completed a [18F]NOS PET lung imaging scan and provided blood samples for measuring established peripheral biomarkers of inflammation. Data were analyzed using a Kruskal-Wallis H test and correlation analyses.
Results: Kruskal-Wallis H test revealed differences in binding potential (BPnd; p=.04), with e-cigarette users showing higher BPnd than cigarette smokers and controls. In e-cigarette users only, correlation analyses between two compartment modeling PET imaging parameters and biomarkers of inflammation revealed significant associations between the pro-inflammatory cytokine interleukin-6 with K1 (r=0.90, p=0.04) and the inflammatory cytokine tumor necrosis factor-alpha (TNFα) with BPnd (r=0.95, p=0.01).
Conclusions: Greater lung [18F]NOS BPnd in e-cigarette users suggests greater pulmonary inflammation, and the correlation between TNFα and BPnd provides additional support for this interpretation. These preliminary findings imply that individuals using e-cigarettes to vape nicotine-containing e-liquids represent a unique pro-inflammatory phenotype distinct from both combustible nicotine smokers and healthy controls.

M151. Co-Effect of Air Quality and Smoking on Select Maternal-Newborn Outcomes Across Rural Vs. Urban Continuum

Ekaterina Burduli[*1], Solmaz Amiri[1], Celeste Burke-Conte[2], Celestina Barbosa-Leiker[1], Ofer Amram[1], Sterling McPherson[1]*
[1]Washington State University, [2]Gonzaga University
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: This study examines the co-effect of air quality and maternal smoking during pregnancy on novel, not widely examined adverse infant outcomes (e.g., birth defects, composite adverse infant outcome) as well as maternal outcomes (e.g., composite adverse maternal outcome, odds of c-section delivery, gestational hypertension) and compares this co-effect between rural and urban populations.

Methods: We analyzed n=593,088 geocoded maternity records between 2010-2016 in Washington State. Data on air pollution were obtained from an integrated geographic regression model. Variables in the regression model included population, elevation, traffic and other emissions, land use, land cover, and satellite-derived estimates of particle pollution. Rurality was quantified using Rural-Urban Continuum Codes. Using adjusted logistic regression models, we examined the co-impact of air quality and smoking during pregnancy comparing odds of 1) composite adverse maternal outcome 2) composite adverse infant outcome 3) delivery method 4) birth defect, and 5) gestational hypertension, within and across urban and rural dwellers in healthy pregnancies.
Results: Controlling for smoking during pregnancy, poorer air quality led to 5% higher odds of adverse maternal outcomes (p<.01); 9% higher odds of adverse infant outcomes (p<.01); and 10% higher odds of infant birth defects (p<.01). Stratified analysis showed that these findings persisted when examining urban dwellers only and not rural dwellers. The only exception was the composite adverse infant outcome where poorer air quality led to higher odds of adverse infant outcome in both urban and rural areas (9% and 12%) (p<.01).
Conclusions: These findings reflect the deleterious co-impact of smoking and air quality on maternal-infant outcomes, particularly in urban settings. Understanding the interaction of these variables is important for improving outcomes through multifaceted prevention and treatment approaches.

Virtual Poster Q&A Session I: Opiates/Opioids

M54. New Insights on the Mechanisms Underlying the Cytotoxicity of Psychoactive NBOMe Derivatives

Daniel Martins[*1], Eva Gil-Martins[1], Carlos Fernandes[1], Renata Silva[1], Fernanda Borges[1]*
[1]University of Porto
Abstract Detail Animal Study
Select Drug Category Club/Designer Drugs
Topic Pharmacology
Abstract Category Original Research
Aim: N-Benzylphenethylamine (NBOMe) derivatives are a potent class of new psychoactive substances (NPS) that are presently circulating worldwide.1 Actually, a Portuguese drug checking service reported that 10% of lysergic acid diethylamide (LSD) samples submitted for analysis by users were misrepresented by NBOME derivatives.2 NBOME derivatives have been developed as highly potent 5-HT2A agonists and their toxicity hasn't been fully clarified, although the consumption of these compounds has been related with cases of severe intoxication.3 Whilst for the most classic illicit drugs (e.g. amphetamines, opiates), well-established toxicological profiles have been described, the literature regarding these NPS derivatives is, at this moment, scarce.4
Methods: To gather information on their toxicological profiles, Mescaline, 4-nitro-2,5-dimethoxyphenethylamine (2C-N), 4-bromo-2,5-dimethoxyphenethylamine (2C-B), and their corresponding N-benzylated compounds were synthesized and human neuronal SH-SY5Y cells were used as an in vitro model after differentiation into a dopaminergic phenotype. The cells were exposed to the phenethylamine derivatives for 24 hours and their cytotoxicity evaluated by the neutral red uptake and resazurin reduction assays.
Results: Their potential to induce oxidative stress was also evaluated by checking their effects on ROS/RNS formation and on intracellular reduced glutathione (GSH) levels. Despite the lack of marked effects on ROS/RNS production, 24 hours after exposure, a significant depletion of intracellular GSH was noticed for all tested compounds, except mescaline. The modulatory effects of cytochrome P450 (CYP) inhibitors were also evaluated. Inhibition of CYP3A4 with ketoconazole or inhibition of CYP2D6 with quinidine significantly increased the cytotoxicity of some of the tested derivatives, highlighting that CYP-mediated metabolism can operate as a potential detoxification pathway.
Conclusions: A concentration-dependent cytotoxic effect was observed. There is a marked effect on the toxicological profile with the N-Benzylation of phenethylamine-based psychoactive drugs. The results obtained will be presented and discussed in this communication.

M55. Test-Retest Reliability and Cross-Cultural Applicability of DSM-5 Adopted Diagnostic Criteria for Ketamine Use Disorders

Nicole Fitzgerald[*1], Catherine Woodstock Striley[1], Joseph Palamar[2], Linda Cottler[1]*
[1]University of Florida, [2]New York University School of Medicine
Abstract Detail Human

Select Drug Category Club/Designer Drugs
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Despite rising rates of nonmedical use of ketamine in many parts of the world and evidence for ketamine's dependence potential, data on the prevalence of disordered use of ketamine are limited. No study has yet evaluated the reliability or applicability of DSM-based diagnostic criteria for ketamine use disorder.
Methods: Participants who used ketamine (lifetime use >5 times) were recruited through the Tri-City Study of Club Drug Use, Abuse, and Dependence in St. Louis, Miami, and Sydney (N = 205). The computerized Substance Abuse Module for Club Drugs (CD-SAM) was used to assess the prevalence of ketamine use disorder and severity level. Reliability of diagnoses and individual diagnostic criteria were determined using the kappa coefficient (κ) and Yule's Y statistic (Y).
Results: Overall, 36.1% met DSM-5 adopted criteria for ketamine use disorder at either baseline or retest interview. Moderate to substantial test-retest reliability was observed consistently across study sites for any ketamine use disorder (κ=0.57, Y=0.61) and severe ketamine use disorder (κ=0.62, Y=0.79), while only fair reliability was observed for both mild and moderate use disorders. 'Continued use of ketamine despite knowledge of physical or psychological problems' (69.3%) was the most frequently endorsed individual criterion, followed by 'withdrawal' (38.5%) and 'physically hazardous use' (37.6%). All criteria had acceptable reliability estimates (κ≥0.41).
Conclusions: DSM-5-based diagnoses of ketamine use disorder can be reliably evaluated in different communities using the CD-SAM's diagnostic algorithm, although caution is warranted for mild and moderate use disorders. Future research is needed regarding the degree to which polysubstance use among persons who use ketamine complicates reporting of ketamine-specific effects and consequences.

M56. REL-1017 (esmethadone) Showed No Reinforcing Properties Compared to Oxycodone in Rat Self-Administration Study

Jack Henningfield[*1], David Gauvin[2], Francesco Bifari[3], Reginald Fant[1], Judy Caron[3], August Buchhalter[1], Judy Ashworth[1], Marco Pappagallo[3], Franco Folli[3], Paolo L. Manfredi[3]*
[1]Pinney Associates, Inc., [2]Charles River Laboratories, Inc., [3]Relmada Therapeutics, Inc.
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: REL-1017 (esmethadone; dextromethadone) is an NMDAR channel blocker with a preference for hyperactive channels and has twenty-fold lower activity at the μ(mu)-opioid receptor than racemic methadone. REL-1017 is being developed for treatment of Major Depressive Disorder. The purpose of this study was to evaluate the potential reinforcing effects of REL-1017 compared to oxycodone in an intravenous (IV) rat self-administration study.
Methods: Rats were conditioned to self-administer oxycodone during daily access periods. Three-day substitution test sessions were instituted in rats trained to self-administer either oxycodone or saline vehicle (placebo) or four doses of REL-1017: 0.032, 0.056, 0.1 and 0.18 mg/kg. Measures of individual values for total number of infusions, total drug intake, and response rate (measured as number of drug induced injection) were collected for three consecutive days. Linear regression functions (slopes) were calculated and fitted to the total number of injections during each three-day interval.
Results: Oxycodone maintained stable intake over a wide range of doses functioning as a robust reinforcer. Saline demonstrated a typical "extinction burst" pattern of response, in which initial exposure resulted in lever-pressing and several injections, followed by decreased responding across sessions as is typical of non-reinforcing stimuli in this assay (slope -28,25 vs 0.05; $p<0.05$, saline and oxycodone respectively). The day-to-day patterns of intakes during access to various doses of REL-1017 were statistically indistinguishable from the patterns engendered by saline in this study (p=ns). REL-1017 did not show evidence of reinforcing properties.
Conclusions: REL-1017 did not produce reinforcing effects in this study, which suggests that it will not pose a risk for diversion or abuse. These results are consistent with the conclusion that REL-1017 differs substantially from methadone in its pharmacology and abuse potential.

M57. Modeling the Population Level Impact of Opioid Agonist Treatment on Mortality Among People Accessing Treatment Between 2001-2020 in New South Wales, Australia

Annick Borquez[1], Antoine Chaillon[1], Chrianna Bharat[2], Jack Stone[3], Nicola Jones[2], Louisa Degenhardt[2], Sarah Larney[4], Michael Farrell[2], Donald Weatherburn[2], Peter Vickerman[3], Matthew Hickman[5], Natasha Martin[1]*
[1]University of California, San Diego, [2]National Drug and Alcohol Research Centre, [3]Bristol University, [4]Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM) and Department of Family Medicine and Emergency Medicine, Université de Montréal, [5]NIHR School of Public Health

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: While the individual-level effectiveness of opioid agonist treatment (OAT) in reducing mortality risk is well established, demonstrating its benefits at population-level is important. We use dynamic modeling informed with unique longitudinal linked data from the OAT program in New South Wales (NSW), Australia, to estimate the impact of OAT on mortality among those accessing treatment from 2001-2020.
Methods: We used linked data on OAT provision, incarceration, and mortality among a cohort of 49,359 individuals who ever received OAT in NSW from 2001-2020 to develop a deterministic mathematical model of mortality from overdose and other causes. The model incorporated prior information on OAT's effect on reducing mortality (but increasing it in the first month of treatment initiation/discontinuation) and on reducing incarceration. It also incorporated elevated mortality in the first month post-release from prison. We calibrated the model in a Bayesian framework to incarceration, OAT engagement, and death data from 2001 to mid-2018. We estimated the impact of OAT on mortality among the cohort from 2001-2020, compared to a counterfactual of no OAT. We also specifically assessed the contribution of OAT provision in prison and the impact of eliminating excess mortality during OAT initiation/discontinuation.
Results: Our model estimates that over 2001-2020 there were 2020 [95% credible interval (I): 971-3089] overdose deaths and 5268 [95%I: 3694-6693] other cause deaths among this cohort. OAT provision resulted in a 53% [95%I: 49%-56%] and 27% [95%I: 22%-30%] reduction in overdose and other cause mortality, respectively. OAT provision in prison with post-release OAT-linkage accounted for 12% of averted deaths. Preventing increased mortality during OAT initiation/discontinuation could have increased the relative OAT program impact by 12%.
Conclusions: The OAT program in NSW averted a substantial number of premature deaths between 2001-2020. The ability to link data across public sectors provides a powerful tool to demonstrate the population-level impact of public-health interventions.

M58. Patient-Reported Sleep Disturbances Across the Lifespan in Persons in Treatment for Opioid Use Disorder

Andrew Huhn[1], Jami Mayo[1], Jennifer Ellis[1]*
[1]Johns Hopkins University School of Medicine

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Persons with opioid use disorder (OUD) often report sleep disturbances during active opioid use and recovery, but the persistence and origins of sleep disturbances have not been elucidated in this population. The goal of this study was to examine current symptoms of insomnia and retrospective self-reported sleep quality across the lifespan in persons in treatment for OUD.
Methods: Participants were recruited via online crowdsourcing and underwent a blinded screening survey to determine eligibility. Participants who met DSM-V criteria and endorsed being in treatment for OUD completed a survey regarding their current sleep quality and symptoms of insomnia on the Insomnia Severity Index (ISI), their sleep quality during childhood (ages 0-11) and adolescence (ages 12-18) on a 0-100 point visual analogue scale, and the degree to which they experienced persistent sleep disturbance, difficulty maintaining regular sleep patterns, and sleep problems interfering with mood and behavior on a 5-point Likert scale, and pre-treatment withdrawal symptoms on the Subjective Opioid Withdrawal Scale (SOWS).

Results: The majority of participants (52.6%) qualified for current clinical insomnia on the ISI. Participants with clinical insomnia reported worse sleep during childhood (t(152)=3.02, p=.003) and adolescence (t(152)=3.50, p=.001) than participants without clinical insomnia. Younger age of first opioid use was associated with worse sleep quality during adolescence (r=.160, p=.048), and higher SOWS was associated with greater lifetime sleep disturbance (r=.213, p=.008), difficulty maintaining sleep regular sleep patterns (r=.271, p=.001), and sleep interfering with mood and behavior (r=.268, p=.001).
Conclusions: Clinically significant insomnia is common in persons in treatment for OUD. Sleep disturbances that develop in childhood and adolescence may persist throughout the lifespan and may be associated with severity of physical dependence on opioids in this population. For some individuals, persistent sleep disturbance may be associated with the etiology of OUD and serve as a barrier to recovery.

M59. COVID-19 Impacts, Overdose, Self-Care and Survival Strategies of People who Use Illicit Opioids in New York City

Alexander Bennett[*1], Luther Elliott*[1]
[1]*New York University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research
Aim: To examine the impacts of COVID-19 on overdose and risk and protective practices among people who use illicit opioids (PWUIO), and the self-care and survival strategies they developed in response to the pandemic.
Methods: As part of an ongoing longitudinal study of PWUIO in New York City (n=576), we conducted qualitative interviews with 40 participants, all trained in overdose education and naloxone distribution (OEND) by the study, between March and July 2020. Topics of inquiry were loosely organized around Rhodes' risk environment framework, engaging social, environment, economic, and policy domains. We used a hybrid inductive/deductive approach to code COVID-19 impacts and PWUIO's adaptations and responses.
Results: Findings illuminate myriad challenges PWUIO faced as the pandemic evolved in NYC. Social distancing policies compelled more solitary use, heightening the risk of overdose mortality, compounded by a fluctuating and riskier drug supply, with more suspected fentanyl. Some participants responded to the stresses and disruption by increasing opioid use and engaging in other risky practices, e.g., polysubstance use, sharing syringes. However, most adopted safety practices to address increased overdose risk, implementing OEND training messages and developing tailored solutions adapted to pandemic contexts – e.g., buddy check-in systems, using smaller amounts, drug checking, routinely possessing naloxone. When participants were presented with clear and accurate covid-19 prevention knowledge and resources, such as wearing masks and hand washing, they implemented them.
Conclusions: Pandemic conditions and associated social distancing policies and drug market, service and other structural disruptions led to increased overdose risk for PWUIO. Accurate information allowed participants to adopt new behaviors and adapt to changed contexts to increase their health and safety, reducing drug-related risks.

M60. The Role of Gender in the Association Between Pain Severity and Moderate/Severe Substance Use Among Patients Prescribed Opioids Within Community Pharmacy

Elizabeth Charron[*1], M. Aryana Bryan*[1], Andrew Ferguson*[2], Jennifer Brown*[2], Gerald Cochran*[1]
[1]*University of Utah,* [2]*University of Cincinnati*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: Evidence suggests that gender differences exist in pain perception and coping mechanisms in response to pain severity. This exploratory analysis examines associations between pain severity and moderate/severe substance use by gender among community pharmacy patients prescribed opioids.
Methods: We conducted a secondary analysis of data from a cross-sectional health assessment of women (n=911) and men (n=550) filling opioid prescriptions. Pain severity was measured using the Brief Pain Inventory (BPI) and categorized into mild, moderate, and severe pain using validated cut-points. Substance use, including alcohol, cannabis, opioid, and tobacco, was classified using the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). Multivariable logistic regression models were used to estimate gender-specific associations of

pain severity with moderate/severe substance use. Covariates included demographics, health status, depression, and pharmacy site.
Results: A greater proportion of women compared to men had severe pain (51.8% vs 45.1%; p=0.01). Women with severe pain and moderate pain had higher odds of moderate/severe tobacco use compared to women with mild pain (severe pain: adjusted odds ratio [aOR]=3.96, 95% confidence interval [CI] =2.02-7.79; moderate pain: aOR=2.60, 95% CI=1.32-5.11). Women with severe pain had higher odds of moderate/severe opioid use than women with mild pain (severe pain: aOR=2.70, 95% CI=1.58-4.61). Men with severe pain and moderate pain had higher odds of moderate/severe opioid use than men with mild pain (severe pain: aOR=3.98, 95% CI=2.10-7.54; moderate pain: aOR=1.97, 95% CI=1.06-3.67). Pain severity was not associated with moderate/severe use of alcohol or cannabis.
Conclusions: Moderate/severe substance use in this sample was related to pain severity. Moderate/severe use of substances in association with pain severity differed by gender. Behavioral health interventions for patients with pain within pharmacy settings should incorporate gender-specific components. Specifically, evidence-based opioid overdose education could be targeted to men and women, with targeted brief tobacco intervention for women.

M61. Improving Equity and Access to Buprenorphine Treatment Through Telemedicine at Syringe Service Programs

Barrot Lambdin[1], David Kan[2], Ricky Bluthenthal[3], Alex Kral[1]*
[1]RTI International, [2]Bright Heart Health, [3]University of Southern California
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Program Descriptions
Aim: Access to buprenorphine in the United States remains low and disparities regarding who receives treatment have emerged. Federal laws have regulated buprenorphine delivery, ultimately limiting its implementation more broadly. At the onset of the COVID-19 pandemic, federal agencies acted quickly to remove a legal barrier, effectively allowing people with opioid used disorder (OUD) to initiate buprenorphine treatment via telemedicine. Leveraging this policy shift, a low barrier buprenorphine treatment initiative via telemedicine was started at two syringe service programs (SSP) in California. We aim to describe the program and participants reached by this model of treatment.
Methods (Optional): Starting in May 2020, buprenorphine treatment was offered through a virtual platform to participants at 2 SSPs in California. SSP staff connected interested participants to virtual appointments with medical providers in confidential settings. During these visits, clinicians conducted clinical assessments for OUD and developed an induction plan for eligible individuals in nonclinical settings. Participants were prescribed a 7-day supply of up to 16mg daily buprenorphine or 16mg buprenorphine-2mg naloxone and asked to return the following week to continue treatment.
Results (Optional): From June to September 2020, the 58 participants started treatment with the SSP-buprenorphine virtual care initiative. Of those inducted, 67% were between the ages of 30 and 49 and 31% were cisgender female. Treatment cost were covered by Medicare/Medicaid in 96% of the cases, by private insurance in 2%, and by participant self-pay in 2%. Overall, 76% of participants returned for a second buprenorphine prescription refill.
Conclusions: These early findings suggest that this could be a promising approach to improve equity and access to buprenorphine treatment. We encourage policymakers to continue allowing buprenorphine induction via telemedicine and researchers to study whether this approach improves equity and access to treatment throughout the United States.

M62. Post-Traumatic Stress Increases Risk of Concurrent Daily Non-Medical Opioid-Benzodiazepine Use in a Sample of Female Sex Workers

Catherine Tomko[1], Kristin Schneider[1], Susan Sherman[2]*
[1]Johns Hopkins University, [2]Bloomberg School of Public Health
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research

Aim: To estimate the relationship between post-traumatic stress disorder (PTSD) symptoms and concurrent non-medical daily benzodiazepine (BDP) and opioid use in a sample of female sex workers (FSW), a non-veteran population experiencing high levels of trauma but understudied in the U.S.
Methods: Longitudinal data from 323 FSW who used opioids illicitly (i.e., heroin, prescription pain relievers, fentanyl) in Baltimore, MD were collected at baseline, 6-, 12-, and 18-months. PTSD symptoms were measured at baseline and 12-months using the civilian PCL-5 (possible range: 0-80); we imputed missing data by carrying forward the last PCL-5 score for each participant and creating quantiles of overall score and four sub-scales (re-experiencing, avoidance, negative cognition/mood, hyperarousal). Generalized estimating equations with Poisson distribution, robust variances, and exchangeable correlation were used to show associations between PCL-5 quantile and self-reported past 6-month concurrent daily BDP-opioid use. Multivariable models adjusted for recent paying client-perpetrated violence, unmet health need, and binge drinking.
Results: The analytical sample was n=815 observations. Participants were an average of 37 years old, 60% white race, and sold sex for 13 years on average. Prevalence of daily opioid use was 88% (720/815), daily BDP use was 12% (101/815), and concurrent use was 12% (98/815). Average PCL-5 score was 33 (s.d.=20.7). In adjusted results, FSW with PCL-5 scores in the highest quantile had elevated risk of daily BDP-opioid use compared to the lowest quantile (aIRR=3.40, 95% CI=1.51-7.61). Similarly, the highest quantile of each subscale (compared to the lowest) had elevated risk of daily BDP-opioid use: re-experiencing (aIRR=2.34, 95% CI=1.18-4.61); avoidance (aIRR=2.49, 95% CI=1.19-5.20); negative cognition/mood (aIRR=3.20, 95% CI=1.42-7.23); hyperarousal (aIRR=2.32, 95% CI=1.03-5.23).
Conclusions: Greater severity of PTSD symptoms is associated with increased risk of concurrent daily BDP-opioid use among FSW. Efforts to address trauma and its psychological effects in this population are greatly needed and may mitigate overdose risk.

M63. REL-1017 (esmethadone) Demonstrates No Withdrawal Effects or Evidence of Physical Dependence in a Rat Study

David Gauvin[*1], Jack Henningfield[2], Reginald Fant[2], August Buchhalter[2], Judy Ashworth[2], Judy Caron[3], Marco Pappagallo[3], Francesco Bifari[3], Franco Folli[3], Paolo L. Manfredi[3]*
[1]Charles River Laboratories, Inc., [2]Pinney Associates, Inc., [3]Relmada Therapeutics, Inc.
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Tolerance/Dependence
Abstract Category Original Research
Aim: REL-1017 (esmethadone) is a novel NMDA channel blocker in development for major depressive disorder (MDD). REL-1017 has twenty-fold lower affinity than levomethadone at the mu-opioid receptor. According to a 2019 DEA statement, "The d-isomer lacks significant respiratory depressant action and addiction liability but possesses antitussive activity." We assessed the potential of REL-1017 to produce physical dependence and signs of withdrawal. The active comparators were morphine and ketamine.
Methods: Consistent with FDA's 2017 guidance, 16 Sprague-Dawley rats/group were administered saline (control group), REL-1017 (62.5 or 100 mg/kg), ketamine (200 mg/kg) or morphine (300 mg/kg) twice daily for 30 days by oral gavage. Measures related to drug administration (Days 1, 15, 30) and discontinuation effects (Days 1 to 9 after the last dose was administered) were collected including locomotor activity and functional observational batteries. Statistical analysis compared treated groups with control group.
Results: Compared to control, REL-1017 group did not demonstrate statistically significant changes in most of the withdrawal syndrome measures over the 9 days after discontinuation of daily dosing. Ketamine-treated rats showed variable differences related to increased locomotor activity (～ 15% $p<0.01$). Morphine-treated rats demonstrated significant changes in elements of cluster of signs of withdrawal of the opiate-type, including parameters of activity and arousal (increase of easy of removal scores～ 120%, increase of handling reactivity scores ～ 75%, and decrease of rearing counts～ 66%; $p<0.01$), of autonomic (increase of defecation counts～ 90%, ps<0.05), neuromuscular (increase of hindlimb grip strength～ 15%, ps<0.05) and sensorimotor (non-threatening approach response, tail pinch, and simple body-touch increase ～ 10%, ps<0.05) activity, as well as decreased weight (～ 14%, $p<0.01$).

Conclusions: REL-1017 produced no evidence of physical dependence or withdrawal syndrome. This study confirms that REL-1017 does not have full opioid agonist effects and is consistent with the 2019 DEA statement on abuse liability.

M64. Effects of Lorcaserin on Opioid-Induced Observable Behavior in Rhesus Monkeys

Daniel Borgatti[*1], Jack Bergman[1], Stephen Kohut[1]*
[1]*McLean Hospital*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Serotonergic ligands that target the 5HT2-family of receptors, such as the 5HT2C receptor agonist lorcaserin, have been shown to decrease several of the abuse-related effects of opioids, including self-administration and relapse-related behavior. However, the impact of 5HT2C agonists on behaviors relevant to opioid withdrawal have not been reported. The objective of the present study was to determine whether lorcaserin alters behavioral signs indicative of opioid withdrawal in morphine-dependent nonhuman primates.
Methods: Adult rhesus monkeys (N=4; 3 males, 1 female) with histories of drug self-administration received twice daily (0930 and 1700-hr) morphine injections (intramuscularly) for a total daily dosage of 9.0 mg/kg/day over a 6-8-month period. Behavioral observations were conducted by a blind observer over a 6.5 hr period on test days conducted twice per week. Spontaneous withdrawal was elicited by replacing the 0930-hr morphine injection with saline while precipitated withdrawal was elicited by administering naltrexone (0.0032 and 0.01 mg/kg/inj) 3-hr after morphine injections; test drugs were administered 15 min after saline or naltrexone.
Results: Results show that saline produced a time-dependent increase in observable behavior throughout the observation period while morphine (1.0 and 4.5 mg/kg) dose-dependently attenuated observable signs compared to saline, with the highest dose nearly eliminating withdrawal signs. Lorcaserin (0.3 and 1.0 mg/kg/inj) produced a modest decrease in observable signs (~30%) at the lowest dose but was ineffective at the higher dose. Naltrexone produced approximately 30% more observable signs compared to saline, particularly at the first timepoint (30 min), but this effect gradually dissipated over 3hr. Lorcaserin (1.0 mg/kg) attenuated the initial increase but was otherwise similar to naltrexone alone.
Conclusions: Overall, these data suggest that lorcaserin does not appreciably alter opioid withdrawal signs.

M65. Pregnant Women's Willingness to Participate in a Longitudinal Cohort of Woman-Child Dyads

Deepthi Varma[*1], Kelly Gurka[1], Maya Mualem[1], Manjiri Rose[1], Matthew Gurka[1]*
[1]*University of Florida*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Other
Abstract Category Original Research
Aim: Given the scope of the opioid epidemic, the impact of prenatal substance exposure on child development should be examined during prospective studies. To effectively recruit and retain woman-child dyads over long periods, understanding barriers and facilitators to participation is critical. Thus, we conducted focus groups with women who were pregnant and/or provide care for young children.
Methods: Thirty-six women participated in eleven focus group discussions (FGDs). Two FGDs were conducted in-person, while nine were via Zoom. Quantitative surveys were administered prior to each FGD. All FGDs were audio recorded, transcribed, and analyzed using Atlas Ti™ qualitative analysis software.
Results: Participants were a mean age of 36 years. Thirty-one women identified as White, three as Black, and three as Asian. Four of the women who identified as White, also identified as Hispanic/Latino ethnicity. Twenty-six women reported lifetime substance use. The majority of participants expressed willingness to enroll in a study for up to ten years. Uncertainty about their future residence, the time commitment, transportation, childcare, and fear of being reported for substance use were some of the barriers reported. Rapport with the research team and trust that substance use would not be reported were reported facilitators. Noninvasive procedures such as collection and drug testing of urine, meconium, and cord blood and developmental assessments were acceptable, while procedures such as magnetic resonance imaging of the child brain were acceptable if mothers were present.

Coinciding study assessments with pediatric appointments, advance scheduling with multiple reminders, some home visits, feedback and referrals based on assessment results, and appropriate incentives for women and children were suggested to improve enrollment and retention.
Conclusions: In the presence of adequate resources and relationship building, these findings suggest widespread willingness among women to enroll in prospective cohort studies examining the impact of prenatal substance use on child development.

M66. Prevalence of Self-Reported Cognitive Impairment in Adults With Opioid Use Disorder Adherent to Buprenorphine or Extended-Release Naltrexone

Efrat Aharonovich[1], Dvora Shmulewitz[1], Abigail Zavod[2], Elizabeth Keane[2], Anna Legedza[2], Deborah Hasin[1], Maria Sullivan[3]*
[1]*Columbia University & New York State Psychiatric Institute,* [2]*Alkermes, Inc.,* [3]*Alkermes, Inc., Columbia University & New York State Psychiatric Institute*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Opioid use disorder (OUD) is associated with cognitive impairment, but little is known about self-perceived cognitive impairment among adults using medications for OUD (MOUD). We explored (i) prevalence and types of self-reported impairments in attention, executive function, and memory (primary objective), (ii) factor structure of cognitive items, and (iii) associations between self-reported impairments and MOUD type.
Methods: A cognitive self-report survey was administered to a clinical sample of adults with OUD (N=255) adherent to buprenorphine (BUP, n=139) or extended-release naltrexone (XR-NTX, n=116). Impairments in attention/executive functions and memory were assessed with Executive Function Index (EFI) and Prospective Retrospective Memory Questionnaire (PRMQ) items, respectively. Factor analysis explored item factor structure; item scores were summed to generate scales, and association was estimated by linear regression.
Results: Most patients had impairment in ≥1 EFI or PRMQ item (primary endpoint; EFI: BUP 82.7%, XR-NTX 78.5%; PRMQ: BUP 50.4%, XR-NTX 47.4%). Factor analysis generated 3 cognitive scales: attention (6 items), executive (3), and memory (8) (higher scores=less impairment). Attention scale was associated with sex, education, other medication use, head injury, seizures, amphetamine/methamphetamine use, depression, and anxiety ($p<0.05$). Attention scale score was higher for XR-NTX than BUP (beta=0.35 [95%CI=0.12,0.59]), with an attenuated effect after adjustment for related covariates (beta=0.21 [95%CI=-0.00,0.41]). Memory scale was associated with sex, age, use of medication for depression, head injury, anxiety, and depression ($p<0.05$), but not with MOUD type (beta=0.11, [95%CI=-0.14,0.35]). Executive scale was associated with sex, age, use of medication for depression, caffeine, and amphetamine/methamphetamine use ($p<0.05$), but not with MOUD type (beta=0.06, [95%CI=-0.19,0.30]).
Conclusions: Prevalence of self-reported cognitive impairments in adults on stable MOUD was high. Among scales examined, differences between MOUD type were only observed in favor of XR-NTX for attention (prior to covariate adjustment). Exploration of how these findings relate to standard objective cognitive tests is warranted.

M67. Lorcaserin Engages the Serotonin (5-HT) 5-HT2A Receptor (5-HT2AR) and 5-HT2CR to Control the Reinforcement Value of Oxycodone in Male Sprague-Dawley Rats

Erik Garcia[1], Christina Merritt[1], Robert Fox[1], Noelle Anastasio[1], Kathryn Cunningham[1]*
[1]*University of Texas Medical Branch*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Preclinical studies illustrate that serotonin 5-HT2C receptor (5-HT2CR) agonists suppress heightened vulnerability to drug abuse and relapse. The high-affinity, full 5-HT2CR agonist lorcaserin reduces oxycodone self-administration (SA) and decreases its reinforcement value in behavioral economic models of SA. However, lorcaserin is a partial 5-HT2AR agonist. The present experiments were designed to delineate the role of the 5-HT2AR vs. 5-HT2CR in lorcaserin-evoked reductions in oxycodone value in a within-session threshold procedure of oxycodone SA.

Methods: Male Sprague-Dawley rats (n=12) acquired oxycodone SA (0.1 mg/kg/inf) on a fixed ratio-1 schedule of reinforcement and progressed to a within-session threshold procedure until stable. The within-session threshold procedure systematically increased the price of oxycodone (responses/mg) every 20 min. Rats self-administered oxycodone without timeouts during each 20-min epoch. The total session length was 220 min. The selective 5-HT2AR antagonist M100907 (0.01 mg/kg; i.p.), 5-HT2CR antagonist SB242084 (0.5 mg/kg; i.p) or vehicle was administered 30 min prior to start of the session. Lorcaserin (0.25, 0.5, 1 mg/kg; s.c.) or saline was injected 15 min before the start of the session. Oxycodone SA was analyzed with an exponentiated demand function to determine consumption at a minimally constrained price (Q0) and demand elasticity (α).
Results: Lorcaserin (1 mg/kg) dose-dependently suppressed oxycodone consumption, (Q0; $p < 0.05$) and increased demand elasticity, (α; $p < 0.05$). The increase in α was fully reversed following pretreatment with SB242084 (α; $p < 0.05$) . Interestingly, M100907 partially blocked the efficacy of lorcaserin to increase α ($p < 0.05$).
Conclusions: Lorcaserin reduces oxycodone SA by increasing α, a measure of reinforcer value. Blockade of either receptor subtype partially (5-HT2AR) or fully (5-HT2CR) blocks lorcaserin-evoked modulation of oxycodone reinforcement value. These data reveal the potential of a new therapeutic strategy to activate both 5-HT2AR and/or 5-HT2CR receptors to suppress oxycodone SA.

M68. Impact of Complex Comorbidity Conditions on Survival of Opioid Use Disorder Patients

Zhe Fei[*1]*
[1]University of California, Los Angeles
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: The readily availability of large scale EHR data allows us to better understand certain diseases and the interplay among them. We aim to find potential risk factors from a large number of comorbidity diagnoses that could affect the survival of Opioid Use Disorder (OUD) patients from a cohort at UCLA health EHR system.
Methods: The OUD patient cohort consists of over 2,500 patients from 2006 to 2014, among which 465 deaths were observed.
High dimensional Cox model was used and 71 potential risk factors, including age, gender, race, physical health diseases, other substance use disorders and mental disorders, etc. Penalized regression was applied to select important predictors and their effects and significance levels were estimated using a high dimensional inference method.
Results: The median observed survival time is 4.2 years in 2576 patients, with a censoring rate of 82%. The following risk factors are found to be significantly associated with patients' survival after Bonferroni correction for multiple testing: Self-pay insurance plan (v.s. Medicare/MediCal, hazard ratio (HR) = 6.26, 95% CI = (4.79,8.20)); Age at first OUD diagnosis (HR = 1.04, 95% CI = (1.03,1.05)); Ever diagnosed with heart diseases (HR = 1.68, 95% CI = (1.32,2.13)); Ever diagnosed with respiratory diseases (HR = 1.60, 95% CI = (1.27,2)); Ever diagnosed with Infectious diseases (HR = 1.66, 95\% CI = (1.29,2.14)); Ever diagnosed with cancer (HR = 1.58, 95% CI = (1.22,2.04)).
Conclusions: Patients' survival after first OUD diagnosis was found to be associated with their age at the OUD diagnosis, financial source of insurance and disease diagnoses of heart, respiratory, infectious and cancer, while others are NOT associated, including diabetes, STD, HIV, mental disorders (psychotic, bipolar, depression, anxiety) and other substance use disorders (tobacco, alcohol, cannabis). Careful monitoring of the identified risk factors may help improve OUD patients' long-term survival.

M69. Characterizing Potential Overdose Harm Reduction Strategies for People who Use Opioids While Alone in a Treatment-Based Sample of People Using Opioids Daily

Rachel Gicquelais[*1], Becky Genberg[2], Jessica Maksut[2], Amy Bohnert[3], Anne Fernandez[3]*
[1]University of Wisconsin - Madison, [2]Johns Hopkins Bloomberg School of Public Health, [3]University of Michigan
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction

Abstract Category Original Research
Aim: Avoiding use of opioids while alone reduces overdose fatality risk; however, consistently using opioids while around others may not be feasible for some individuals. We aimed to describe the overdose harm reduction needs of people who use opioids while alone.
Methods: We described frequency of using opioids while alone among 241 people reporting daily heroin use or misuse of opioid analgesic medications (OAMs) in the month before attending a substance use disorder treatment program in the Midwestern US. Prevalence ratios adjusted for sociodemographic and substance use characteristics described correlates and overdose risk behaviors of using opioids while alone very often vs. less frequently or never.
Results: Approximately 63% of participants misused OAMs while alone very often and 70% used heroin while alone very often. Fearing or anticipating stigma from substance use was associated with using while alone very often (aPR: 1.20, 95% CI: 1.04-1.38) vs. less often or never in adjusted analysis. Drinking alcohol, taking sedatives, or using heroin within two hours of OAMs, and using OAMs in a new setting were associated with misusing OAMs while alone very often (vs. less often or never). Taking sedatives within two hours of using heroin and using heroin in a new setting were associated with using heroin while alone very often (vs. less often or never).
Conclusions: Anticipated substance use-related stigma may hinder efforts to avoid using alone. Personalized, non-stigmatizing overdose harm reduction plans should incorporate strategies for maximizing safety when using opioids while alone, such as by avoiding or staggering polysubstance use.

M70. Evaluating the Feasibility and Usability of a Digital Platform to Deliver Comprehensive Treatment for Opioid Use Disorder

Jordon Bosse[*1], P. Todd Korthuis[2], Dennis McCarthy[2], Kim Hoffman[2], Ximena Levander[2], Brian Chan[2], Stephen Martin[3]*
[1]Northeastern University, [2]Oregon Health & Science University, [3]Boulder Care, Inc; UMass Medical School
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: To evaluate the usability and feasibility of our mobile application (app) for enrolling patients with OUD into telehealth care and to incorporate patient user experience and feedback into app design improvements.
Methods: Participants with history of treatment for OUD (n=11) were recruited via paid Twitter advertisements and word-of-mouth for a virtual, in-depth focus group or individual one-on-one interview. Participants were from the Northeast US and White (100%), and predominantly women (73%), living in non-urban areas (91%) with a mean age of 40.2 (range 30-64). Participants provided feedback on a series of app screen shots of existing and proposed features. Nine participants (6 women, 3 men) subsequently completed our enrollment process and provided feedback on each visit and the overall process including the app's usability.
Results: All participants (n=11) reported the participant-facing app was "very" appealing and perceived it would be easy to use. All participants who subsequently participated in the enrollment process reported being "extremely" comfortable with the app, which they used at least once a day; all found the app intuitive and reported it fit into their life well. All participants who went through our enrollment process reported they would prefer to receive treatment from Boulder Care via telehealth vs traditional treatment in the future, highlighting benefits such as increased privacy and a reduction in multiple barriers to treatment using our platform. Participants' feedback on the enrollment process using the app identified potential challenges (e.g. missing push notifications/reminders), which allowed the product team to develop solutions (e.g. adding the ability to receive notifications via text).
Conclusions: Our app is simple to use and it is feasible to enroll participants into telehealth treatment for OUD using our digital health platform. Provision of care for OUD via mobile technology is convenient and has the potential to reduce or eliminate many barriers associated with treatment.

M71. Influence of Opioid Use Disorder and Acute Withdrawal on Decision-Making

Joshua Lile[*1], Joshua Beckmann[2], Shanna Babalonis[1], Joseph Alcorn[2], Kevin Hatton[1], Hays Lon[2], Miranda Ramirez[1], Abner Rayapati[2], Craig Rush[2], William Stoops[2], Michael Wesley[1]*
[1]University of Kentucky, College of Medicine, [2]University of Kentucky
Abstract Detail Human

Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: This ongoing study seeks to determine the effects of opioid use disorder and withdrawal on decision-making using a probabilistic reinforcement learning choice (PRLC) task. In this task, two options are signaled by distinct cues and choosing either could result in the delivery of a monetary reinforcer, but the reinforcement probabilities of the options differ, and change unpredictably during the task. We hypothesized that individuals physically dependent on opioids would display similar performance to controls when maintained on an opioid agonist but relatively impaired performance during withdrawal.
Methods: All subjects initially complete PRLC task training as outpatients. Opioid-dependent subjects (N=6, 3F) are admitted as inpatients, stabilized on oxycodone (40 mg, 4x/day) and complete two PRLC sessions under opioid-maintained and opioid-withdrawn conditions. Withdrawal is verified by validated scales and analyzed by t-tests. Matched control subjects (N=6, 3F) complete the PRLC task during one outpatient session. PRLC task data are analyzed by a generalized matching model, reinforcement learning (RL) modeling, and paired/unpaired, parametric/nonparametric pair-wise tests (as appropriate).
Results: Double-blind substitution of placebo for oxycodone induced withdrawal (e.g., Clinical Opiate Withdrawal Scale scores [Mean±SEM] = 3.8±1.7 vs 16.0±0.9, p=0.003). Matching analysis indicated that the ability to track the "richer" option did not differ as a function of opioid use history or withdrawal status (slope: controls=0.34±0.04, opioid-maintained=0.38±0.04, opioid-withdrawn=0.39±0.03). Log likelihood values revealed that RL models separating opioid-maintained (-143.09±13.22) and opioid-withdrawn (-156.48±15.19) data had improved fits relative to when all opioid user data were included in a single model (-302.09±28.27), supporting the separate analysis of parameter estimates across conditions. RL parameter estimates were not significantly different across groups and conditions (e.g., alpha/learning rate: controls=0.67±0.08, opioid-maintained=0.59±0.05, opioid-withdrawn=0.55±0.07).
Conclusions: These preliminary results suggest that non-drug-related decision-making capacity in opioid-dependent individuals is comparable to controls, even during withdrawal. Future research will determine the impact of withdrawal on drug-versus-money choice.

M72. Need for Additional Support of Front-Line Workers Regarding Navigating Ethical Dilemmas in Outpatient and Residential Opioid Use Disorder (OUD) Treatment

James Sorensen[1], J Konadu Fokuo[2], Caravella McCuistian[1], Jaime Smith[1], Mallory Shingle[1], Sania Elahi[1], Homero del Pino[3], Emily Arnold[1]*
[1]University of California, San Francisco, [2]University of Illinois, Chicago, [3]University of California, Los Angeles
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Ethical issues arise constantly in OUD treatment. They can sap energy and enthusiasm of clinical staff and prevent engaging and retaining patients. Counselors need additional support to navigate ethical dilemmas. To address this gap we assessed how OUD counselors face ethical issues and incorporate ethical principles in their work.
Methods: We conducted in-depth interviews with 20 front-line staff in two residential and outpatient treatment programs, presenting brief vignettes depicting issues drawn from ethical principles of the national organization representing SUD counselors. The 60-90-minute interviews asked open-ended questions about how counselors deal with issues and use of training experiences. Interviews were recorded, transcribed, and coded using thematic analysis. Counselors enrolled through phone or internet contact, and clinics leaders did not know who participated. Counselors varied in age (31-72 years), counseling experience (1-8 years), and race/ethnicity. Eleven self-identified as in recovery from substance use, and 65% were women.
Results: All participants had encountered ethical dilemmas. Areas of concern were related to confidentiality, inappropriate use of social media, client-counselor boundaries, tensions between workplace expectations and client welfare, fairness/equity, and meeting clients' complex needs. Ways participants resolved ethical issues ranged from consultations with staff or supervisors, relying on current resources, using direct approaches to resolve ethical dilemmas, commitment to providing client-centered care, and in some cases resigning from their position. All participants reported receiving ethics training during orientation or certification. Online trainings

were not viewed as helpful. Useful training in the workplace was sparse. All participants expressed needs for additional ongoing support to resolve workplace ethical dilemmas. Participants recommended vignette-based approaches, role-playing, and peer support.
Conclusions: Although the importance of ethical issues is universally acknowledged in caring for substance use disorders, results of this study spotlight the need for more and better training and ongoing supervision about ethical issues in OUD treatment.

M73. An Exploratory Analysis of Drug Dreams Among Individuals With Opioid Use Disorder

Jennifer Ellis[*1], Jami Mayo[1], Andrew Huhn[1]*
[1]Johns Hopkins University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Sleep disorders and poor sleep quality are common among individuals with opioid use disorder (OUD). Drug dreams are often reported among individuals with OUD, but only a small number of studies have explored the content and correlates of these dreams.
Methods: Individuals in treatment for OUD (N=154) reported on their experiences with drug dreams, and completed questionnaires assessing sleep quality and sleep disorders, pain, mental health symptoms (e.g., stress, anxiety), and opioid use history and OUD severity. Chi-square and one-way ANOVA were used to explore correlates of experiencing a recent drug dream. Among those who had experienced a recent drug dream, correlates of post-dream craving and emotional distress were explored. The Benjamini-Hochberg procedure was used to correct for the false discovery rate.
Results: Over half of the sample (n=83, 53.8%) reported experiencing a drug dream in their lifetime, and 24.7% (n=38) of the sample had a drug dream in the past week. Participants who experienced a drug dream in the past week reported worse sleep quality ($F(2,152)=5.24$, $p=.006$), greater insomnia ($F(2,152)=4.44$, $p=.005$), worse sleep hygiene ($F(2,152)=3.11$, $p=.048$), and greater risk for sleep apnea ($\chi2=17.33$, $p=.002$) than the rest of the sample. Higher pain catastrophizing and lower pain resilience were also observed in this group. Among those who experienced a drug dream in the past week, post-dream craving and emotional distress were positively related to anxiety ($rs>.36$, $ps<.027$), insomnia ($rs>.37$, $ps<.021$), pain catastrophizing ($rs>.38$, $ps<.022$), and worse sleep hygiene ($rs>.40$, $ps<.014$).
Conclusions: Drug dreams were common in the present sample, particularly among individuals experiencing other sleep disturbances. Individuals with anxiety may be particularly susceptible to post-dream craving and emotional distress. Assessing for drug dreams along with other forms of sleep disturbance may be beneficial in clinical practice.

M74. Drug Use, Craving, and Affect in Daily Life During HCV Treatment in People who Inject Drugs: Benefits Associated With Achieving Sustained Virologic Response

Jeremiah Bertz[*1], Leigh Panlilio[1], Sarah Kattakuzhy[2], Christopher Brokus[3], Jasmine Stevens[3], Kate Gannon[3], Landhing Moran[1], Kenzie Preston[1], Karran Phillips[1], Elana Rosenthal[2]*
[1]National Institute on Drug Abuse, [2]University of Maryland School of Medicine, [3]National Institutes of Health
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Significant barriers remain to treating hepatitis C virus (HCV) infection in people who inject drugs (PWID), despite the availability of direct-acting antivirals (DAA). We used smartphone-based ecological momentary assessment (EMA) to better understand the daily lives of PWID receiving HCV treatment and identify factors associated with HCV cure (sustained virologic response, SVR).
Methods: 54 outpatients (22 female, 32 male) with chronic HCV infection and ongoing opioid misuse received standard-of-care DAA treatment for 12 weeks with testing for SVR 12 weeks after treatment completion. Throughout these 24 weeks, participants provided EMA data (n = 48-52 across endpoints) with study-issued smartphones, including self-reported stress, craving, mood, pain, sleep, and drug use. Differences by SVR (n = 39

yes, 15 no/unknown) were analyzed with linear mixed models or generalized linear mixed models for continuous and categorical variables, respectively.
Results: Participants with SVR reported significantly less stress, opioid craving, pain, and drug use; participants with SVR also reported more positive and negative mood (main effect of SVR for each: $7.46 < F < 25.19$; $.00001 < p < .0093$; $.39 < r$ effect $< .61$). A significant main effect was not observed for cocaine craving or sleep duration. Comparing weeks 1-12 vs. 13-24 (i.e., during vs. after DAA administration), those without SVR showed significantly increased drug use and craving in weeks 13-24 (time by SVR interaction for each: $9.03 < F < 23.46$; $.00003 < p < .0050$; $.46 < r$ effect $< .66$).
Conclusions: SVR was associated with less drug use and several affective benefits (less stress, opioid craving, and pain; more positive mood), although more work is needed to understand the negative mood associated with SVR. These results identify some potential benefits of HCV cure and possible targets for interventions to improve HCV treatment outcomes.

M75. Associations Between Childcare Responsibilities, Harm Reduction, and Overdose Risk Among Men and Women who Use Illicit Opioids in New York City

Joy Scheidell[*1], Maria Khan[1], Luther Elliott[2], Alexander Bennett[2]*
[1]New York University Grossman School of Medicine, [2]National Development and Research Institute, Inc.
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: To examine relationships among childcare responsibilities, naloxone use, and overdose (OD) risk among people who use illicit opioids (PWUIO), and differences in effects for men and women.
Methods: Using baseline data from an ongoing study among PWUIO in New York City (n=576), we measured childcare responsibilities (i.e., has children, residing with children in the past month), and barriers to treatment and services (i.e., avoidance for fear of child welfare, difficulty accessing due to childcare issues). Harm reduction and OD risk included training in and carrying of naloxone, and reporting ≥1 past-month OD experience (e.g., lost consciousness, required medical assistance). We estimated gender differences in distributions of childcare responsibilities and OD risk. Among those with children, we estimated associations between childcare responsibilities and OD risk, using modified Poisson regression with a product-interaction term for gender differences.
Results: In the total sample (n=576), approximately 70% of men and women reported having children. Compared to men, women were more likely to reside with children (25% vs 36%), avoid treatment for fear of child welfare (16% vs 26%), and less likely to be trained in naloxone (68% vs 61%). Among participants with children (n=403), residing with children appeared associated with reduced prevalence of naloxone training among women (adjusted prevalence ratio [APR] 0.78, 95%CI: 0.54, 1.12) and elevated prevalence among men (APR 1.20, 95%CI: 0.94, 1.54). Avoiding treatment for fear of child welfare was associated with not carrying naloxone (APR 1.36, 95%CI: 1.04, 1.77) overall, with stronger associations among women (APR 2.51, 95%CI: 1.05, 2.18). Difficulty accessing services due to childcare was associated with lifetime OD (1.68, 95%CI: 1.13, 2.50).
Conclusions: Children often motivate parents' drug treatment, but childcare responsibilities may be a barrier for harm reduction and treatment for both men and women. Research is needed, and treatment and services should seek to be accessible for parents.

M76. A Pilot Study of Nonpharmacological Pain Management Intervention Groups in Methadone Maintenance Treatment

Kimberly DiMeola[*1], Jeff Haynes[1], Meredith Barone[1], Mark Beitel[2], Lynn Madden[2], Christopher Cutter[3], Anthony Raso[2], Marina Gaeta[2], Xiao Zheng[2], Declan Barry[2]*
[1]APT Foundation, [2]Yale University and APT Foundation, [3]Yale University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: We examined the feasibility (i.e., single session attendance) of implementing three counselor-delivered nonpharmacological pain management intervention (NPMI) groups in methadone maintenance treatment (MMT):

1) Coping with Pain, an intervention based on cognitive-behavioral therapy, 2) Wii-Covery, an exergame intervention to promote physical activity, and 3) Juggling Group, an intervention to facilitate social inclusion and decrease anxiety. We also examined acute pre-post session changes in pain and mood associated with NPMI group attendance.
Methods: Over one month at a MMT clinic with 1,800 patients, each NPMI group was offered daily Monday-Friday and one was offered on Saturdays. A 7-item standardized measure was administered before and after NPMI sessions to assess acute changes in current pain intensity and mood states. Paired t-tests with Bonferroni corrections were performed for each NPMI group ($p < .0007$ [.05/7]).
Results: 452 patients (67% male, 84% White, mean age, 40) attended at least one NPMI group. 59% reported current chronic pain. Attendance at any NPMI group (for the whole sample and the subset with chronic pain) was significantly associated with acute reductions in current pain intensity, anxiety, depression, and stress, and acute increases in current energy and happiness. Attendance at Coping with Pain and Juggling Group was also associated with acute increases in compassion.
Conclusions: Coping with Pain, Wii-Covery, and Juggling Group are feasible to implement in MMT, and acute improvements in current pain intensity and mood states associated with a single session attendance suggest the importance of examining systematically the efficacy of these and other NPMIs in MMT

M77. Depot Buprenorphine XL (Sublocade) Treatment Registry London, Canada

Kenneth Lee[*1]*
[1]*University of Western Ontario Faculty of Medicine*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: To analyse the real-world treatment retention with Depot Buprenorphine XL (Sublocade). Sublocade has been used in our clinic since October 2019 (early access via Health Canada Special Access Program). Market launch in Canada was in February 2020 and Ontario government formulary coverage commenced in May 2020. It has been established that longer retention in Opiate Agonist Treatment (OAT) correlates with increased treatment success.
Methods: Analysis of treatment retention with the use of Depot Buprenorphine XL (Sublocade) using data extracted from the clinical records Opiate Agonist Treatment (OAT) patients in London, Canada from October 2019. As of December 31, 2020, we have treated 75 patients with Sublocade. We report on the treatment retention statistics in this patient cohort.
Results: Overall treatment retention is 72%. Most dropouts (90%) occurred before 6 months and 50% of these occured during the first 2 months (during the period of loading doses). 10% dropouts occurred beyond 6 months. If a patient remains in treatment to the 6-month mark, then it is likely that this patient will continue in OAT.
Conclusions: If a patient reaches the 6-month mark in Sublocade OAT, it is likely that this patient will remain in treatment. This coincides to the attainment of steady state plasma Buprenorphine levels, which occurs after 5-6 Sublocade doses. Although this is not proof of a causal relationship, this is a hypothesis to consider and suggests a basis for further research.

M78. Psychological Distress and Psychosocial Functioning in Black Women and LGBTQ+ Community Members Enrolled in a Specialized Program Targeting Engagement and Retention in HIV Care and SUD Treatment

Krysten Garcia[*1], Vickie Walters[1], Josh Shetterly[1], Jessica McGuire[1], Angela Mason[1], Jacyln Sadicario[2], Dace Svikis[2]*
[1]*REACH Health Services,* [2]*Virginia Commonwealth University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Black women and people identifying as LGBTQ+ who have Opioid/Other Drug Use Disorders are often less likely to seek treatment for their SUD as well as such comorbidities as trauma, PTSD and HIV. To reduce social stigma and address barriers to care, the BRITER Program (Bringing Resources Individually to Engage Recovery)

was initiated under the larger umbrella of a MOUD treatment program. The present study examined mental health and psychosocial characteristics for the two patient groups at baseline enrollment in BRITER.
Methods: Participants (n = 108) were recruited from March 2019 to June 2020 and included 82 African American females (AAF) and 26 people identifying as LGBTQ+. All completed standardized measures, including the GPRA, PCL-5 and HIV/AIDS Risk Assessment. Group comparisons were made using chi square for categorical and t-tests for continuous variables.
Results: Demographically, most participants were female (89.8%) and African American (89.9%). Nearly two-thirds (65.4%) were between 45-64 years old. Recent (past 30 days) substance use included: cocaine (33.3%); heroin (25.9%) and alcohol (25%). While the two groups had similar PCL-5 and Quality of Life scores, the LGBTQ+ sample was more likely than the AAF group to report clinical anxiety (84.6% and 58.5%; p< .015), with a similar trend for recent use of prescribed psychotropic medications (61.5% and 41.5%; p<.074). Ratings of recent psychological distress were 2.4 for LGBTQ+ and 1.7 for AAF groups (p<.054), with LGBTQ+ members reporting more recent days of both depression (17 vs 11 days) and anxiety (18.5 vs 11.5 days) compared to AAF (p<.03 and p<.02, respectively).
Conclusions: The present study affirmed high rates of psychological distress for both groups, but particularly among LGBTQ+ participants. Additional analyses will compare the 2 groups at 6-month follow-up.

M79. Time-Lagged Association Between Psychosocial Treatment Attendance and Subsequent Opioid Use in a Randomized, Clinical Trial of Medication for Opioid Use Disorder

Kathryn Hefner[1], Dikla Blumberg[2], Tse-Hwei Choo[3], Marc Fishman[4], Miranda Greiner[5], Jaquie King[2], Edward Nunes[6], Sarah Myers-Ohki[7], Martina Pavlicova[8], John Rotrosen[9]*
[1]Emmes Data and Statistics Center, NIDA CTN, [2]The Emmes Company, [3]Columbia University Mailman School of Public Health, [4]Maryland Treatment Center, [5]Columbia University Irving Medical Center and ew York State Psychiatric Institute, [6]Columbia University and New York State Psychiatric Institute, [7]New York University Grossman School of Medicine, [8]Columbia University, [9]NYU Langone School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Psychosocial counseling is recommended in conjunction with medications for opioid use disorder (MOUD), although optimal “dose,” modality, and/or timing of counseling is unclear. This study comprised a secondary analysis of counseling attendance and its relationship with subsequent opioid use in a randomized clinical trial of MOUD.
Methods: The parent study, CTN-0051, enrolled 570 participants randomly assigned to receive buprenorphine-naloxone (n=287) or extended-release injectable naltrexone (n=283). Group and/or individual counseling sessions and NA/AA were available to participants at each of the 8 sites during the 24-week study. Mixed-effects logistic regression models were fit with Opioid Use (urine screen and Timeline Followback) as the response variable, and a counseling/NA/AA predictor (Dichotomous: Yes vs. No; Continuous hours).
Results: Any counseling/NA/AA at the prior weekly visit was associated lower odds of opioid use at the subsequent visit (OR=0.54); any individual counseling (OR=0.61), group counseling (OR=0.43), and AA/NA (OR=0.52) were each associated with reduced odds of opioid use at the subsequent visit, respectively. A continuous relationship was observed for AA/NA attendance (F(1,5083)=5.01, p=.025); each additional hour of AA/NA was associated with an additional 13% reduction in odds of opioid use at the subsequent visit. Examining effects over time, each additional hour of counseling/NA/AA was associated with 5% reduction in odds of opioid use early in the trial but increased to 11% lower odds of opioid use at trial end. Similarly, for group counseling (F(1,5083)=6.75, p=.009), each additional hour was associated with 3% lower odds of opioid use early in the trial, but 15% lower odds at trial end.
Conclusions: Counseling and mutual support have a proximal association with opioid use outcomes. Attendance of any type may promote abstinence, and the strength of that association may grow with dose and time. Alternatively, more motivated patients may both attend more counseling and have better treatment outcomes.

M80. Prolonged Exposure Therapy for Treating Post-Traumatic Stress Disorder Among Individuals Receiving Buprenorphine or Methadone for Opioid Use Disorder

Kelly Peck[1], Nathaniel Moxley-Kelly[1], Rebecca Cole[1], Gary Badger[1], Stacey Sigmon[1]*
[1]*University of Vermont*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Comorbidities
Abstract Category Original Research
Aim: Posttraumatic stress disorder (PTSD) frequently co-occurs with opioid use disorder (OUD). Although prolonged exposure therapy (PET) can improve PTSD symptoms among individuals receiving concurrent substance use treatment, attendance rates are notoriously poor, and little is known about the effects of PET among patients receiving concurrent opioid agonist treatment (OAT; e.g., buprenorphine and methadone) for OUD. This ongoing 12-week pilot study is examining the initial feasibility of an incentive program for increasing attendance to PET sessions and the effects of PET above and beyond OAT for reducing PTSD symptomatology among adults with concurrent OUD and PTSD.
Methods: Thus far, 25 participants with concurrent PTSD and OUD have been randomized to receive either: a.) OAT as usual (n=8), b.) OAT+PET (n=8), or c.) OAT+PET with attendance-based incentives (OAT+PET+; n=9). PET consists of 12 weekly 60-minute sessions. The OAT+PET+ group also receives monetary incentives delivered contingent upon completion of PET sessions (max $920). Primary outcomes include percentage of sessions attended and PTSD symptom severity. Secondary outcomes include depression, anxiety and illicit opioid use severity.
Results: Participants randomized to receive OAT+PET+ are more likely to attend therapy sessions compared to those randomized to OAT+PET (84.4% vs. 29.1% of sessions attended, respectively; p<.001). In terms of PTSD outcomes, participants in all three groups are reporting significant (p's<.01) reductions in PTSD symptom severity. Participants in all three groups are also reporting reductions on other measures of psychiatric symptom and illicit opioid use severity; however, these findings are more varied.
Conclusions: Thus far, attendance-based monetary incentives are increasing rates of attendance to PET sessions. However, participants are demonstrating significant reductions in PTSD symptom severity regardless of group. Accordingly, more work is needed to disentangle the effects of PET and OAT on symptoms of PTSD.

M81. Utilization of Monthly Depot Buprenorphine for Opioid Use Disorder (OUD) Before and After COVID-19

Lindsey Hammerslag[1], Jeffery Talbert[1], Katherine Marks[1], Laura Fanucchi[2], Patricia Freeman[1], Svetla Slavova[1], Sharon Walsh[1], Michelle Lofwall[2]*
[1]*University of Kentucky*, [2]*University of Kentucky, College of Medicine*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: The COVID-19 pandemic created access and retention challenges in OUD treatment. Extended-release buprenorphine formulations have potential advantages over transmucosal (TM) buprenorphine for persons at risk of losing medication coverage, but costs and insurance barriers have limited utilization. On April 3, 2020 Kentucky (KY) Medicaid lifted prior authorization requirements (PAs) for Sublocade® monthly depot buprenorphine. While removing PAs for TM buprenorphine improves utilization and retention, it is not yet known if these benefits extend to Sublocade®. This study examines Sublocade® utilization pre-post PA removal and investigates whether treatment with Sublocade® or TM buprenorphine changed during the COVID-19 pandemic.
Methods: Data from KY's prescription drug monitoring program, which tracks individual-level dispensed Sublocade® and other buprenorphine prescriptions, were used to compare weekly utilization for three time periods: before PA removal (Jan-Feb 2020), COVID lockdown-PA removal period (March-April 2020) and after PA removal (May-June 2020). Additionally, data from KY Medicaid, will be used to analyze treatment initiation and retention during these time periods.
Results: Relative to rates in January-February 2020, average weekly Sublocade® prescriptions increased by ~40% in March-April 2020, from 22.6 to 31.7, while weekly prescriptions of TM buprenorphine decreased by 3%, from 22,124.4 to 21,451.6. In May-June 2020, Sublocade® prescriptions increased by 69%, relative to January-February 2020, while TM buprenorphine prescriptions increased by only 0.32%.

Conclusions: Preliminary results suggest that Sublocade® utilization was increasing prior to PA removal and increased to a greater extent than TM buprenorphine during the initial COVID-19 lockdown period. Subsequently, TM buprenorphine utilization increased, but at a slower rate than Sublocade®. Pending data analyses from Kentucky Medicaid will provide greater insight into patient retention outcomes.

M82. Emotional Reactions of Trained Overdose Responders who Use Opioids Following Intervention in an Overdose Event

Laura Brandt[*1], Aimee Campbell[1], Jermaine Jones[1], Suky Martinez[1], Joanne Neale[2], Stephen Parkin[3], Caral Brown[3], John Strang[4], Sandra Comer[1]*
[1]Columbia University Irving Medical Center and New York State Psychiatric Institute, [2]King's College London; University of New South Wales; South London and Maudsley NHS Foundation Trust, [3]King's College London, [4]King's College London; South London and Maudsley NHS Foundation Trust

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research

Aim: Our aim was to explore emotional reactions to intervening in an overdose event from the perspective of individuals who use opioids (peer responders). In addition, we were interested in the impact this experience may have on peer responders' feelings about helping in an overdose situation in the future.
Methods: For this qualitative sub-study of a randomized controlled trial (RCT), data from 61 interviews were analyzed thematically using an inductive approach.
Results: Peer responders had diverse emotional reactions following the overdose event. For some peer responders, positive aspects of this experience prevailed. They were grateful that the person who overdosed survived, they felt fortunate about having been in the right place at the right time, and some described a sense of pride in relation to their ability to help. Others expressed ambivalence about being involved in these challenging situations. Some peer responders reported that overdose events were relatively commonplace and described a certain emotional blunting to this kind of experience. Having been involved in an overdose reversal also prompted challenging self-reflection, with responders re-considering their own opioid use. Although participants seldom referred to the overdose event as an exclusively negative experience, some reported distress and frustration related to negative reactions (including anger and even aggression) by the person who overdosed. Many peer responders perceived it as their duty to use naloxone again if required. However, some had mixed feelings toward this responsibility, which may have been related to negative experiences with previous intervention efforts.
Conclusions: The capacity of people who use opioids to help reduce the harms associated with opioid overdose is experienced as empowering by some. Nonetheless, engaging peer responders in strategies to reduce opioid-related mortality should be coupled with appropriate resources to process their experiences and emotional responses.

M83. Transition of Care From the Emergency Department for Patients With Opioid Use Disorder who Receive Buprenorphine

Lauren Nguyen[*1], Karl Jablonowski[1], Kevin Hallgren[1], Dawn Taniguchi[1], Lauren Whiteside[1]*
[1]University of Washington

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: Previous work has shown that patients with opioid use disorder (OUD) in the Emergency Department (ED) who receive buprenorphine have increased treatment retention compared to those who do not receive buprenorphine. Implementation of this practice requires an effective referral to clinic. The study objective is to describe possible barriers and facilitators to attendance and correlates of attendance at a low-barrier outpatient-based opioid treatment (OBOT) clinic for patients who received ED-initiated buprenorphine.
Methods: A retrospective study was conducted of female and male patients who were prescribed or dispensed buprenorphine in the ED at Harborview Medical Center (HMC) in Seattle, WA, discharged to the community, and referred to the HMC After Care Clinic (ACC) from June 1, 2019 – June 1, 2020. Patient and visit-level characteristics were abstracted from the electronic medical record. Double-abstraction of hand-abstracted variables

was performed on 20% of charts for reliability. Statistical methods included descriptive statistics and logistic regression to predict attendance at ACC.
Results: A total of 146 participants were included and 44 (30%) attended their ACC visit. Of all patients, 105 (71.9%) were un-housed, 129 (88.4%) were not employed, and 86 (58.9%) concomitantly used methamphetamine. Being un-housed (odds ratio [OR] 0.32, 95%CI 0.12-0.86) and having an incarceration history (OR 0.28, 95%CI 0.10-0.77) were negatively associated with ACC attendance. Having a cell phone (OR 1.53, 95%CI 0.55-4.27), a history of a psychiatric disorder (OR 1.89, 95%CI 0.75-4.76), and being treatment-seeking (OR 1.81, 95%CI 0.70-4.71) had a positive trend toward attendance, although did not reach statistical significance.
Conclusions: Among these patients in the ED with OUD who received buprenorphine, there were many social risk factors, including housing status, that may present barriers to attendance at continued outpatient care. Future programs should screen for these factors to assist with a more successful transition to outpatient buprenorphine management for this vulnerable population.

M84. Factors Associated With Pain Treatment Satisfaction Among Safety-Net Patients With Chronic Non-Cancer Pain and Substance Use

Leslie Suen[*1], Vanessa McMahan[2], Christopher Rowe[2], Sumeet Bhardwaj[3], Kelly Knight[4], Margot Kushel[4], Glenn-Milo Santos[4], Phillip Coffin[2]*
[1]UCSF and San Francisco VA Medical Center, [2]San Francisco Department of Public Health, [3]University of Toronto, [4]University of California, San Francisco
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Concerns of opioid-related overdoses have led to changing prescribing policies, decreasing opioid prescriptions for chronic non-cancer pain (CNCP) in safety-net settings. The impact on pain treatment satisfaction in individuals with CNCP and illicit substance use is unknown. We sought to identify levels and associated factors of pain treatment satisfaction in individuals with CNCP on recent opioid therapy and active or prior substance use.
Methods: We completed a cross-sectional analysis using baseline data from a prospective cohort study, including interview, clinical pain assessments, urine drug screening, and medical chart review. We enrolled 300 adults from 2017-2019 receiving primary care in the San Francisco Health Network (SFHN), a network of safety-net clinics for publicly insured and uninsured patients. Participants had CNCP, received >20 morphine milligram equivalents (MME) of opioids for at least three of the preceding twelve months, and had prior or active substance use. The primary outcome was satisfaction with pain treatment. Covariates included demographics, pain and pain treatment, mental health, and substance use characteristics.
Results: Participants were on average 57.5 (SD ± 8.1) years old, predominantly cisgender men (60%), and non-Hispanic Black (44%). Approximately 39% had low, 28% moderate, and 33% high pain treatment satisfaction. Post-traumatic stress disorder (PTSD) (AOR 0.6, 95%CI 0.3-0.9), tobacco use (AOR 0.6, 95%CI 0.4-0.9), past-year discontinuation of opioids (AOR 0.4, 95%CI 0.2-0.9), and higher average pain scores (AOR 0.9, 95%CI 0.8-1.0) were associated with lower satisfaction. HIV (AOR 1.6, 95% CI 1.0-2.7) and using cannabis for pain (AOR 1.7, 95% CI 1.0-2.7) were associated with higher satisfaction.
Conclusions: The relationship between PTSD and tobacco use with lower treatment satisfaction should be further explored to augment pain outcomes. Higher satisfaction among individuals living with HIV or using cannabis present potential research areas to guide CNCP management and reduce reliance on opioid therapies.

M85. Effect of Brief Nicotine Messaging on Nicotine Related Beliefs Among Persons who Use Opioids

Maria Parker[*1], Andrea Villanti[2]*
[1]Indiana University, [2]University of Vermont
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: This pilot study tested the effect of a brief nicotine education messaging exposure on beliefs about nicotine, nicotine replacement therapy (NRT), and e-cigarettes.

Methods: Participants ages 18 and older were recruited via Amazon Mechanical Turk to complete a 20-minute online survey in April/May 2020 to assess relationships between opioid use, smoking, and other behaviors (n=1,022). Participants completed questions on background characteristics and literacy, and then were randomized in a 2:1 ratio of two conditions: nicotine education (n=391) or no message control (n=194). Beliefs about nicotine, NRT, and e-cigarettes were asked of all participants; this occurred after message exposure for the nicotine education condition. Bivariate and multivariable analyses examined differences in beliefs by study condition.
Results: Brief nicotine messaging increased the probability of a correct response to "Nicotine is a cause of cancer" (false, 62% vs. 35%) and halved the probability of a don't know response (8% vs. 17%) compared to the no message control condition. Nicotine education also reduced false beliefs about specific harms of NRT compared to regular cigarettes (p-values<0.05). Participants in the nicotine education group had lower mean false beliefs about nicotine (p<0.001) and NRT (p=0.009) compared with the control group, but there were no differences in mean false beliefs about e-cigarettes (p=0.121) between groups.
Conclusions: A brief education intervention produced similar changes in nicotine beliefs in adults with past-month opioid use as in a general adult sample. These findings support the potential for widespread impact of nicotine public education messaging in vulnerable populations.

M86. Hepatitis C and Risk Behaviors Among Emergency Department Patients With Untreated Opioid Use Disorder

Marek Chawarski[*1], Michael Lyons[2], Richard Rothman[3], Ethan Cowan[4], Kathryn Hawk[1], Robert Schwartz[5], Judith Tsui[6], Patrick O'Connor[1], Gail D'Onofrio[1], David Fiellin[1], E. Jennifer Edelman[1]*
[1]Yale School of Medicine, [2]University of Cincinnati College of Medicine, [3]Johns Hopkins Medicine, [4]Icahn School of Medicine at Mount Sinai, [5]Friends Research Institute, [6]University of Washington
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Hepatitis C infection (HCV) is prevalent among individuals with opioid use disorder (OUD), leading to adverse individual and public health consequences when unaddressed. This study evaluated correlates of HCV positive status and risk behaviors among ED patients with untreated OUD
Methods: In an exploratory analytical approach, previously collected data on ED patients with untreated OUD (N=394) enrolled between Feb-2017 and Jan-2019 in a multisite hybrid implementation-effectiveness study were evaluated for HCV status and risk factors and behaviors based on self-reports and the scores of drug use subscale of the HIV Risk-Taking Behavior Scale (HRBS)
Results: In the study cohort, 322/394 (82%) individuals reported knowledge of their HCV status: 163/322 (51%) positive and 159/322 (49%) negative. Among HIV positive patients in the study cohort who also knew their HCV status, 11/13 (85%) were both HCV and HIV positive. Individuals who reported being HCV positive had higher scores on the drug use HRBS subscale: the means (SD) 9.10 (7.48) vs. 4.00 (6.41); they also reported higher rates of injection drug use during one month prior to the study enrollment: 133/163 (82%) vs. 61/158 (39%); had higher rates of urine tests positive for amphetamine-type stimulants: 77/163 (47%) vs. 51/159 (32%); reported higher rates of incarceration during 12 months prior to study enrollment: 68/163 (42%) vs. 44/158 (28%); and a lower proportion of them were seeking substance use treatment: 14/163 (9%) vs. 36/159 (23%); p<0.01 for all comparisons
Conclusions: HCV positive ED patients reported higher rates of risk behaviors and risk factors than HCV negative patients. ED visits represent a critical opportunity to link individuals with untreated HCV to indicated treatment and provide or refer to risk reduction interventions. However, increased efforts to successfully engage HCV positive individuals in HCV treatment and in interventions to reduce behavioral risks are urgently needed

M87. A Multidisciplinary Approach to Treat Hepatitis C Infection in People who Inject Drugs

Francina Fonseca[*1], Montserrat Garcia-Retortillo[2], Elena González-Colominas[2], Núria Cañete[2], Daniel Roca[3], Ana Viu[2], Rosa Fernández[2], Judit Romero[2], Esther Garrido[2], Gemma Díaz[2], Gabriel Vallecillo[4], Joan Vidal[5], Teresa Broquetas[2], Marc Puigvehí[2], José Antonio Carrion[2], Susana Coll[2], Núria Carballo[2], Laura Río[2], Santiago Grau[2], Xavier Bessa[2], Marta Torrens[4]*

[1]Universitat Autonoma de Barcelona, [2]Hospital del Mar, Barcelona, Spain, [3]CAS Baluard, Barcelona, Spain, [4]Hospital del Mar Medical Research Institute-IMIM, Barcelona, Spain, [5]CECAS, Barcelona, Spain
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Hepatitis C (HCV) treatment in people who inject drugs (PWID) supposes a challenge due to poor access to treatment, with lower rates of sustained virological response (SVR, defined as undetectable HCV viral load 12 weeks after end of antiviral treatment). A multidisciplinary approach has been created (PAM-ADIC-C) to improve screening, diagnosis, assessment and treatment in patients under addiction treatment.
The aim is to describe the PAM-ADIC-C ongoing protocol and to present the results on adherence and SVR.
Methods: Since 2019 a network of centers/professionals treating addicted patients in our catchment area has been developed. The program is based in: a)point-of-care testing and fast referral; b)accompaniment to visits by social educators; c)reduction in the number of visits; d)pharmacy externalization and on-site treatment delivery; e)coordination and evaluation of program results. We have obtained socio-demographical data, hepatitis C infection data, substance use, comorbidity. Hepatic fibrosis was evaluated with portable transient elastography. Adherence rate has been calculated in patients that completed the treatment.
Results: A total of 119 patients have been referred from the centers of the catchment area, and a total of 95 have been assessed (80%). Patients assessed were male (79%), mean age: 45+9 years; six had received previous treatment and 26% presented advanced liver fibrosis (F3-F4). The 87% of subjects were in OAT (mainly methadone). The 54% presented a comorbid diagnosis (no substance use related). A total of 83 patients completed the treatment, and 54 have completed 12 weeks after end-of-treatment; mean adherence of 97%. SVR has been achieved in 52/54.
Conclusions: A multidisciplinary approach and the co-location of care for HCV infection and addiction treatment in PWID is strategy to achieve better access and more efficacy in this population.

M88. Opioid Use Disorder Treatments: An Evidence Map

Anna Cheng[1], Nancy Pace[1], Mia Malone[1], Alexandria Vittitow[1], Ryan McDonald[1], Joshua Lee[1]*
[1]New York University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Evidence maps are targeted literature searches resulting in an underlying dataset of studies and overlying visual e-document, or map, of a given health topic or scientific field. There are no known evidence maps summarizing opioid use disorder (OUD) interventions. Our aim was a summative and interactive representation of all published interventional and observational trials assessing OUD treatments and outcomes to visually represent the sum of studies at an intervention-outcome node, summarize multiple systematic reviews' treatment effect estimates, and illustrate relative gaps areas with few studies.
Methods: PubMed, Embase, PsycInfo, Cochrane Central Register of Clinical Trials, and Web of Science were systematically searched using relevant MESH terms, without date limitations. Inclusions: human subjects, treatment of OUD, and patient or community-level outcomes, and OUD systematic reviews. Exclusions: animal or human lab studies, review articles, case reports. Two reviewers independently reviewed abstracts and then coded eligible full-text articles by research design, population, intervention, outcomes, sample size, duration, region, and funding source. An Airtable datasheet was uploaded to a customized Tableau file to produce a publically available online interactive evidence map.
Results: The resulting OUD Evidence Map is available at: https://med.nyu.edu/research/lee-lab/research/opioid-use-disorder-treatment-evidence-map. We identified 12,294 abstracts and assessed for relevance. We excluded 9,455 abstracts and reviewed 2,839 full-text articles; 882 were excluded and 1,957 were included in the final evidence map. The most studied interventions and outcomes were methadone (n=1,083 studies), buprenorphine (n=732) naltrexone (n=182), and heroin/opiate use (n=896), treatment retention (n=724), and non-opioid drug use (n=446). Clear gaps included criminal justice settings, emerging mHealth interventions, and the impact of any intervention on overdose events.

Conclusions: This OUD evidence map highlights the importance of pharmacologic interventions for OUD and the proximal treatment outcome of opioid and heroin use reduction. Further iterations will update results annually and add scans for policy and population-level interventions.

M89. An Open-Label, Multicentre, Single-Arm Trial of Monthly Injections of Extended Release Buprenorphine in People With Opioid Use Disorder: The Colab Study

Michael Farrell[*1], Jeyran Shahbazi[1], Marianne Byrne[1], Briony Larance[2], Nicholas Lintzeris[3], Suzanne Nielsen[4], Jason Grebely[5], Marian Shanahan[1], Kari Lancaster[6], Gregory Dore[5], Robert Ali[7], Adrian Dunlop[8], Craig Rodgers[9], Louisa Degenhardt[1]*
[1]National Drug and Alcohol Research Centre, [2]University of Wollongong, [3]South Eastern Sydney Local Health District, [4]Monash University, [5]The Kirby Institute, [6]Centre for Social Research in Health, [7]The University of Adelaide, [8]Hunter New England Local Health District, [9]St. Vincent's Hospital
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: The Community Long-Acting Buprenorphine (CoLAB) study aimed to evaluate patient outcomes among people with OUD receiving 48 weeks of BUP-XR treatment and examined the implementation of BUP-XR in diverse community healthcare settings in Australia.
Methods: Participants were recruited from a network of family practitioner and specialist drug treatment services located in three states in Australia (n=100). Following a minimum 7 days on 8–32 mg of sublingual buprenorphine (±naloxone), participants received monthly subcutaneous Sublocade® injections administered by a healthcare practitioner at intervals of 28 days (−2/+14 days) and completed monthly research interviews. The primary endpoint was participant retention in treatment at 48 weeks after treatment initiation.
Results: Participants comprised of 28 females and 72 males with a mean age of 45 All the participants had a long-established history of OAT with heroin (57%) and prescription opioid (33%) being the predominant primary opioid of concern. The proportion of participants retained in treatment at 24- and 48-weeks following initiation of monthly depot injections was 82% and 76%, respectively.
Most participants (83%) reported that overall, they were extremely or very satisfied with the treatment at the end of study, 14% were satisfied or somewhat satisfied, while only 3% reported dissatisfaction. The majority of participants were satisfied with the convenience, time, and planning requirements of BUP-XR.
Conclusions: The CoLAB study was a real word implementation study of BUP-XR demonstrating high retention and treatment satisfaction. And will further provide important data on the uptake and experience of clients and treatment service providers, with relevance for policy makers, health service planners, administrators, and practitioners.

M90. An Examination Between Treatment Type and Treatment Retention in Persons With Co-Occurring Opioid and Alcohol Use Disorders

Carrie Mintz[*1], Ned Presnall[1], Kevin Xu[1], Sarah Hartz[1], John Sahrmann[1], Laura Bierut[1], Richard Grucza[2]*
[1]Washington University School of Medicine, [2]St. Louis University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Persons with co-occurring opioid use disorder (OUD) and alcohol use disorder (AUD) are at elevated risk for adverse outcomes but are understudied. In this study, we 1) identified whether co-occurring AUD was associated with OUD treatment type, 2) compared associations between OUD treatment types and six-month treatment retention among persons with OUD and AUD, and 3) determined whether co-occurring AUD moderated relationships between treatment type and retention.
Methods: We used an observational cohort study design to analyze de-identified insurance claims from IBM® MarketScan® Commercial and Multi-State Medicaid Databases from 2011-2016. We included persons aged 12-64 with an OUD diagnosis and treatment claim. Our unit of analysis was the treatment episode, defined as consecutive treatment days without a 45-day gap in treatment. We used logistic regression for analyses.

Results: Of 232,806 treatment episodes analyzed, 16% had co-occurring AUD. AUD was associated with decreased likelihood of receiving any medication treatment (OR 0.53, 95% CI 0.52-0.54; p<.0001). AUD was associated with decreased likelihood of buprenorphine (AOR 0.42, 95% CI 0.41-0.44) or methadone (AOR 0.38, 95% CI 0.35-0.41) treatment and increased likelihood of extended-release (AOR 1.45, 95% CI 1.33-1.58) or oral (AOR 2.60, 95% CI 2.47-2.75) naltrexone treatment relative to psychosocial treatment. Buprenorphine and methadone were associated with highest six-month retention prevalence among persons with co-occurring AUD (44.4%, 95% CI 43.2-45.6% for buprenorphine; 57.9%, 95% CI 54.5-61.2% for methadone), followed by extended-release naltrexone (27.9%, 95% CI 25.6-30.6%). Fewer than 20% of persons with OUD and AUD who received oral naltrexone or psychosocial treatment alone were retained in treatment at six months. Co-occurring AUD did not meaningfully change retention estimates for any given treatment.
Conclusions: Buprenorphine and methadone are associated with high rates of treatment retention among persons OUD and AUD, but are disproportionately under-prescribed.

M91. Baseline Patient Characteristics Associated With Successful Induction Onto Extended-Release Naltrexone

Miranda Greiner[1], Matisyahu Shulman[1], Phoebe Gauthier[2], Jennifer Scodes[1], Tse-Hwei Choo[3], Martina Pavlicova[4], Aimee Campbell[1], Patricia Novo[5], Marc Fishman[6], Joshua D. Lee[5], John Rotrosen[7], Edward Nunes[1]*
[1]Columbia University and New York State Psychiatric Institute, [2]Geisel School of Medicine at Dartmouth College, [3]Columbia University Mailman School of Public Health, [4]Columbia University, [5]New York University School of Medicine, [6]Maryland Treatment Center, [7]NYU Langone School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Initiating extended-release naltrexone (XR-NTX) remains a challenge. There are several induction methods that decrease the length of time before XR-NTX initiation and increase the likelihood of induction success. However, less is known about patient characteristics that influence XR-NTX induction. We aim to identify baseline patient characteristics associated with successful XR-NTX induction in the National Drug Abuse Treatment Clinical Trials Network Extended-Release Naltrexone versus Buprenorphine for Opioid Treatment (X:BOT) trial.
Methods: This secondary analysis examined baseline demographic and clinical characteristics associated with successful XR-NTX induction among 283 participants with opioid use disorder (OUD) randomized to XR-NTX in X:BOT. Clinical variables included severity of opiate use, characteristics of opioid and other substance use, treatment history, psychiatric history, and pain. Logistic regression models were used to estimate the effect of the baseline characteristic on the odds of induction success while controlling for randomization timing (early (within 3 days of last opioid exposure) versus late (>3 days since last opioid exposure)). Randomization timing was controlled for given that prior analyses showed early randomizers to have more difficulty inducting onto XR-NTX compared to late randomizers.
Results: 204 (72%) of 283 participants randomized to XR-NTX successfully initiated XR-NTX. Homelessness and pain were the only variables significantly associated with XR-NTX induction. Homelessness was associated with higher odds of successful XR-NTX induction (OR: 2.31; 95% CI: 1.12, 4.76). Individuals that reported moderate or extreme pain were half as likely to successfully induct onto XR-NTX compared to those without pain (OR: 0.49; 95% CI: 0.27, 0.89).
Conclusions: Homeless individuals with OUD were more likely to successfully induct onto XR-NTX, and it may be that long-acting injectable medications are advantageous in this population. Pain management regimens in individuals with OUD should be optimized prior to naltrexone induction. Future research should explore if treatment matching based on patient characteristics can influence successful medication induction.

M92. A Technological Solution to Support Treatment of Opioid Use Disorder in the Primary Care Setting

Mariah Kalmin[1], Bengisu Tulu[2], Li Li[1], Dominic Trupiano[3], Alycia Quick[3], Omar Nieto[1], Christopher Blades[1], Arnie Aldridge[4], Steve Jenkins[3], Steve Shoptaw[1]*
[1]UCLA, [2]Worcester Polytechnic Institute, [3]Q2i, [4]RTI
Abstract Detail Human

Select Drug Category Opiates/Opioids
Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: Medication for opioid use disorder (MOUD) with buprenorphine is highly effective; however, treatment access remains challenging, and patient non-adherence and attrition are common. Primary care providers (PCPs) are well-positioned to provide MOUD, but face barriers in treating this vulnerable patient population. Technological solutions to increase provider experience and patient engagement may enable expanded and enhanced MOUD access for patients most in need.
Opioid Addiction Recovery Support (OARS) software connects a healthcare provider portal to a patient mobile application to support MOUD. We sought to assess acceptability and feasibility of using OARS within the primary care setting. We hypothesized that use of OARS by PCPs and their patients would meet pre-specified feasibility and acceptability metrics.
Methods: PCPs and their patients who were receiving buprenorphine participated in two interviews and used OARS for four weeks from February to August of 2020. Remote interviews provided assessment of OARS acceptability (<20% of qualitative mentions describing barriers/dissatisfactions with using OARS) to support delivery of MOUD in primary care. System usability scale (SUS) scores provided quantitative assessment of OARS acceptability. OARS feasibility was defined as a maximum 20% decrease in the average number of (1) interactions with OARS features and (2) days of engagement with OARS over the study period.
Results: A total of 17 providers and 28 patients completed the study. The percentage of quality mentions describing barriers/dissatisfactions with using OARS was limited to 15% across both PCPs and patients. SUS scores for PCPs (78.1) and patients (82.8) demonstrated high acceptability. The average number of interactions with OARS features and days of OARS engagement decreased by 11% and 13%, respectively, for PCPs and patients across the study period.
Conclusions: OARS demonstrated acceptability and feasibility for supporting MOUD in primary care. Future research should explore whether OARS can result in improved patient outcomes.

M93. Expanding Access to Medication Treatment for Opioid Use Disorder: Trends in MOUD Use in Washington State

Maureen Stewart[*1], Mary Brolin[1], Grant Ritter[1], Morgan Shields[2], Shayna Mazel[1], Sharon Reif[1]*
[1]Brandeis University, [2]University of Pennsylvania
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: The United States continues to struggle with an opioid crisis. Opioid use disorder (OUD) can be effectively treated with medications (MOUD), but they are underutilized. Federal and state governments have engaged in a range of efforts to increase knowledge, availability, and use of MOUD.
This study examined how use of MOUD changed over time in Washington State as the state implemented the Hub and Spoke care model with federal opioid response funding. We hypothesized that the prevalence of MOUD increased over time in Washington State and more rapidly after the influx of federal funds. We expected to observe the most rapid increase in use of buprenorphine, although other MOUD may have increased as awareness grew.
Methods: We analyzed Washington State Medicaid claims data from 2016 through 2019, which included claims for 174,060 adults with OUD. We conducted analyses of trends in MOUD by medication (buprenorphine, methadone, and naltrexone) and by patient demographics. Multivariable regression analysis identified patient-level predictors of receiving MOUD treatment.
Results: In 2016 in Washington State, prior to H&S implementation, on average 55.5% of Medicaid beneficiaries with OUD received MOUD and 15.3% received buprenorphine. In 2019, 62% of Medicaid beneficiaries with OUD received MOUD and 32% received buprenorphine. Use of methadone decreased from 40% in 2016 to 29% in 2019. MOUD rates increased for all races and ethnicities, with the largest increases for individuals who are white and significant differences in type of MOUD by race. No differences were observed in MOUD rates by gender.

Conclusions: Use of MOUD increased dramatically in Washington between 2016 and 2019, but differences by race suggest differences in access to MOUD remain. Increases may be attributed in part to the implementation of the Hub and Spoke Care model, but further research is needed to make this determination.

M94. Understanding the Psychiatric and Psychosocial Correlates of Insomnia in Individuals With Concurrent OUD and PTSD

Nathaniel Moxley-Kelly[*1], Rebecca Cole[1], Gary Badger[1], Kelly Peck[1]*
[1]University of Vermont
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Comorbidities
Abstract Category Original Research
Aim: Insomnia frequently co-occurs with posttraumatic stress disorder (PTSD) and opioid use disorder (OUD). Because insomnia is associated with more severe symptoms and worse treatment outcomes for both disorders, individuals with concurrent PTSD and OUD may be especially vulnerable to the effects of insomnia. However, few studies have examined insomnia in this high-risk and dually diagnosed population. The present study thus compared the psychiatric and psychosocial symptom profiles of individuals with and without insomnia in a sample of participants with concurrent PTSD and OUD.
Methods: Thus far, 16 adults who are currently maintained on buprenorphine or methadone and have a diagnosis of PTSD have completed the Insomnia Severity Index (ISI) at intake and enrolled in an ongoing randomized trial examining the efficacy of prolonged exposure therapy in individuals with concurrent PTSD and OUD. In this secondary analysis, participants with (ISI $\geq$ 15) and without (ISI < 15) clinically relevant insomnia are compared on the Beck Depression Inventory (BDI-II), Beck Anxiety Inventory (BAI), PTSD Checklist (PCL-5), Clinician Administered PTSD Scale (CAPS-5), and Addiction Severity Index (ASI).
Results: On average, participants are middle-aged (M=39.4 years old), male (56%), report some post-secondary education (M=13.1 years of education) and have been maintained on methadone or buprenorphine for 4.2 years. Demographic characteristics do not significantly differ between those with (n=11) and without (n=5) clinically relevant insomnia. However, participants with insomnia are exhibiting more severe symptoms on the BDI-II, BAI, PCL-5, and ASI psychiatric and medical subscales compared to those without insomnia (p's<.05).
Conclusions: Preliminary evidence suggests that insomnia may confer additive psychiatric and medical vulnerabilities upon individuals with concurrent PTSD and OUD. Interventions that target insomnia symptoms may be warranted in this high-risk subgroup. Future research should investigate the relationship between insomnia and psychiatric and medical symptoms longitudinally and in response to treatment.

M95. Innovations in Opioid Addiction Treatment and Harm Reduction Services in Response to COVID-19: A Scoping Review

Noa Krawczyk[1], Adetayo Fawole[*2], Jenny Yang[2], Babak Tofighi[2]*
[1]NYU Grossman School of Medicine, [2]New York University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Literature Review
Aim: The COVID-19 pandemic has brought unprecedented challenges to the delivery of opioid addiction treatment and harm reduction services. At the same time, more flexible regulations around medications for opioid use disorder (MOUD) have led to rapid innovation for delivering low threshold services for people who use opioids. In the current scoping review, we describe initial lessons from novel opioid treatment and harm reduction programs implemented in response to the COVID-19 pandemic.
Methods (Optional): Literature searches were conducted within Pubmed, Litcovid, Embase, and Psychinfo. Databases were searched for peer-reviewed English-language studies published in 2020 that described programs, services or interventions for delivery of opioid treatment or harm reduction in the midst of COVID-19 circumstances. All study designs were eligible if they described a particular program/service or intervention. Abstracts were independently screened by two reviewers. Relevant studies were reviewed in full and those that met inclusion criteria underwent final data extraction and synthesis.

Results (Optional): A total of 416 studies met search criteria and underwent abstract review. Of these, 42 underwent full text review. We are in the final stages of extracting full data from these articles. Results to be reported include the proportion of new programs vs. modifications in programs, the proportion of studies focused on buprenorphine treatment, methadone treatment, naloxone distribution, or other treatment and harm reduction services, and common themes related to long term implications for policy and practice.
Conclusions: There was a widespread effort to rapidly adapt services for people who use opioids to assure continued access to life saving treatments and harm reduction supplies during the COVID-19 pandemic. More flexible regulations around distribution of medications for opioid use disorder allowed for new models of care delivery that were found overall to be safe and essential for reaching marginalized populations during a challenging global pandemic.

M96. Isobolographic Analysis of Alpha2-Adrenergic and Mu-Opioid Receptor Agonists: Schedule-Controlled Responding

Samuel Obeng[1], Julio Zuarth Gonzalez[1], Avi Patel[1], Luis Restrepo[1], Nicholas Ho[1], Lea Gamez Jimenez[1], Francisco Leon[2], Christopher McCurdy[1], Lance McMahon[1], Takato Hiranita[1]*
[1]*University of Florida,* [2]*University of South Carolina*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: The adrenergic-alpha2 receptor agonist lofexidine is an FDA-approved pharmacotherapy for opioid withdrawal. Kratom is reported to attenuate opioid withdrawal; the predominant kratom alkaloid mitragynine has submicromolar affinity for mu-opioid receptors (MORs) and micromolar affinity for adrenergic-alpha2 receptor. Some adrenergic-alpha2 and mu-opioid receptor agonists exert synergistic antinociceptive effects.
Methods: Here, we hypothesized that mu-opioid (morphine and methadone) and adrenergic-alpha2 receptor agonists (lofexidine and clonidine) exert synergistic effects, as assessed with disruptions in lever-pressing behavior for food delivery, increases in hot plate (52°C) response latency (antinociception), and decreases in rectal temperature (hypothermia) in rats.
Results: All compounds tested, including mitragynine (5.6-56 mg/kg, i.p.), dose-dependently decreased rates of lever-pressing. MOR agonists, but not the alpha 2 adrenergic agonists or mitragynine, increased response latency in the hotplate test (greater than 80% maximum possible effects). The alpha 2 adrenergic agonists, but not the MOR agonists or mitragynine, produced 4°C hypothermia. The dose-effect functions of the rate-decreasing and antinociceptive effects of the MOR agonists were shifted to the right by the opioid antagonist naltrexone (0.032-1.0 mg/kg) but not by the alpha 2 adrenergic antagonist yohimbine (3.2 mg/kg). In contrast, the dose-effect functions of the rate-decreasing and hypothermic effects of the alpha 2 adrenergic agonists were shifted to the right by yohimbine but not by naltrexone. The rate-decreasing effects of mitragynine were not blocked by either naltrexone or yohimbine. Synergism between mu-opioid and alpha 2 adrenergic agonists was observed especially at relatively low proportions of MOR agonists in combinations with alpha 2 adrenergic agonists (1:3, respectively).
Conclusions: These results suggest that dual stimulation of mu-opioid and adrenergic-α2 recepto agonists, as appears to occur from a single chemical entity (e.g., mitragynine), results in synergistic effects that includes antinociceptive effects, which might also be generalized to other therapeutic effects (e.g., attenuation of opioid withdrawal).

M97. Overdose Risk and Treatment Access During the COVID-19 Pandemic Among Individuals With Opioid Use Disorder

Paul Joudrey[1], Marek Chawarski[1], Ethan Cowan[2], Kathryn Hawk[1], Michael Lyons[3], Lauren Whiteside[4], Richard Rothman[5], Patrick O'Connor[1], Gail D'Onofrio[1], David Fiellin[1], E. Jennifer Edelman[1]*
[1]*Yale University School of Medicine,* [2]*Icahn School of Medicine at Mount Sinai,* [3]*University of Cincinnati,* [4]*University of Washington,* [5]*Johns Hopkins University School of Medicine*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: We examined overdose events and opioid agonist treatment (OAT) and naloxone access from the perspective of individuals with opioid use disorder (OUD) during the COVID-19 pandemic.
Methods: This was a supplementary study to Project ED Health (CTN-0069). From April 2017-June 2020, ED patients with untreated OUD were enrolled in the parent implementation-effectiveness (hybrid type 3) study of ED initiated buprenorphine conducted in four EDs in New York, NY; Baltimore MD; Cincinnati, OH; and Seattle, WA. We attempted to re-contact all patient participants from August 3 - November 30, 2020 for a telephone-based cross-sectional survey.
Results: Among 740 Project ED Health participants, 98 (13%) were reachable and consented to participation in the study. Among these individuals, 6% reported current or previous COVID-19 infection, 38% reported buying drugs on the street at least weekly, and 6% reported non-fatal overdose during the prior 30 days. Thirty-nine percent reported taking prescribed OAT at the start of COVID-19 social distancing measures, among whom 87% reported adequate access to their regular OAT prescriber since the start of social distancing measures. An additional 7% sought OAT initiation since the start of COVID-19 social distancing measures but had not yet initiated medication treatment. Following the start of COVID-19 social distancing measures, 92% reported no change in access to naloxone, while 5% reported decreased access to naloxone.
Conclusions: Few ED patients with untreated OUD who enter a clinical trial are available for subsequent research up to 3 years later. Enough of those who are available report ongoing symptoms including drug use and overdose during the COVID-19 pandemic providing a rationale for long-term treatment strategies.

M98. The Cost of Providing Extended-Release Naltrexone Opioid Use Disorder Treatment Prior to Release From Incarceration

Philip Jeng[*1], Ali Jalali[1], Danielle Ryan[1], Sabrina Poole[2], Frank Vocci, Jr.[3], Michael Gordon[3], George Woody[2], Daniel Polksy[4], Sean Murphy[1]*
[1]Weill Cornell Medical College, [2]Perelman School of Medicine at the University of Pennsylvania, [3]Friends Research Institute, [4]Johns Hopkins University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: Estimate implementation and ongoing-management costs associated with different strategies of extended-release naltrexone (XR-NTX) delivery to persons with opioid use disorder (OUD) prior to release from incarceration.
Methods: Data were from two multisite randomized-controlled-effectiveness trials comparing pre-release XR-NTX + referral to community pharmacotherapy, to: referral only (Study A); pre-release XR-NTX + post-release place-of-residence mobile treatment (Study B).
A micro-costing approach was used. We solicited estimates of resources required to deliver each strategy from relevant study and site personnel. All intervention-relevant resources were included and valued. The resource-costing method was used, with unit costs derived from sources reflecting national “real-world” costs. Resources varied by study, and included: labor, medication, supplies, and provider travel (mileage, time).
Costs were categorized as (a) fixed, (b) time-dependent, and (c) variable. Year 1 costs included (a), (b), and (c) variable. Subsequent annual costs included (b) and (c).
Results: The in-prison XR-NTX process was estimated to take 2-3.5 hours, on average. Study A adopted an in-house model. Study B’s intervention was delivered by an outside team. Fixed/one-time costs and time-dependent costs were minimal; consequently, per-patient costs vary little with changes in patient caseload. Assuming full capacity, Year 1, per-patient costs were estimated as $979 (Study A), and $3,458 (Study B); subsequent annual costs were $976/patient and $3,453/patient, respectively. $1,320/patient in Study B was associated with only provider travel to and from prison in the pre-reentry portion, and $1,007/patient was associated with the entire post-release mobile portion.
Conclusions: To our knowledge, this is the first study to estimate costs of implementing and operating XR-NTX programs for persons with OUD who are being released from incarceration, making the results valuable to stakeholders interested in expanding OUD treatment in justice settings. The additional value of mobile delivery will depend on relative outcomes associated with each delivery model.

M99. Racial Disparities in Lifetime Access to Medications for Opioid Use Disorder Among Hospitalized Persons who Use Opioids

Raagini Jawa[1], Andrea Wang[2], Michael Stein[3], Bradley Anderson[4], Jane Liebschutz[5], Catherine Stewart[3], Kristina Phillips[6], Joshua Barocas[1]*
[1]*Boston Medical Center,* [2]*Boston University School of Medicine,* [3]*Boston University School of Public Health,* [4]*Butler Hospital,* [5]*University of Pittsburgh,* [6]*Kaiser Permanente Hawaii*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research

Aim: Historically, receipt of medications for OUD (MOUD) has been influenced by a number of social factors, including structural racism within the healthcare system. Hospitalizations for opioid related complications have increased in the U.S. and can serve as an opportunity to decrease disparities to treatment access. We investigated the association between lifetime access to MOUD and race/ethnicity among a cohort of hospitalized persons.
Methods: We conducted a cross-sectional analysis of hospitalized patients who misuse opioids. The primary outcome was lifetime access to MOUD defined as ever prescribed buprenorphine or methadone. We assessed three race/ethnicity groups: 1) white, non-Latinx (white), 2) non-white, non-Latinx (non-white), and 3) Latinx. The non-white group comprised of 50 African American, 7 mixed race, and 10 identifying as other. Individuals in the Latinx group were coded irrespective of racial identification. We used multivariable logistic regression to estimate the odds of lifetime receipt of MOUD, adjusting for age, gender, history of incarceration, homelessness, unemployment, and a standardized measure assessing trust in the medical profession.
Results: We included 252 participants: n=145 white, n= 67 non-white, n=40 Latinx. Non-white and Latinx individuals had lower proportions of lifetime access to MOUD than whites (59.7%, 70%, 77%, respectively). After adjusting for background characteristics and trust in the medical profession, the likelihood of prior MOUD treatment was significantly lower for non-white (adjusted odds ratio (aOR) = 0.15, 95%CI 0.06-0.35, $p < 0.001$) and Latinx participants (aOR = 0.40, 95%CI 0.16-0.98, $p = 0.045$) compared to white participants. Latinx participants had higher odds of ever receiving MOUD than non-white participants (aOR 2.71, 95%CI 1.05-7.01, $p = 0.040$).
Conclusions: Significant disparities exist among white, non-white and Latinx individuals regarding lifetime access to MOUD. Hospitalization may be an opportunity to address structural racism by referring racially/ethnically diverse patients to MOUD treatment.

M100. Examining the Impact of Opioid and Alcohol Use on Sleep: A Potential Buffering Effect of Gabapentin

Rachel Luba[1], Sandra Comer[2], Jermaine Jones[3]*
[1]*New York State Psychiatric Institute,* [2]*Columbia University and NYSPI,* [3]*Columbia University Vagelos College of Physicians and Surgeons*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research

Aim: Chronic substance use contributes to reduced total sleep time, extended sleep-onset latency, greater nighttime awakening and decreased REM sleep, with exacerbations of these effects during withdrawal. Disturbed sleep is often a precursor to relapse and may impact craving. The present study examined objective sleep data among individuals with co-occurring alcohol and opioid use disorders (AUD and OUD, respectively) enrolled in an 8-week inpatient trial.
Methods: This is a secondary analysis of a randomized, double-blind within-subjects study examining the effects of gabapentin (0mg vs 1800mg) on the subjective and physiological effects of oxycodone and alcohol alone, and in combination. Participants (n=13) were non-treatment-seeking individuals with co-occurring OUD and AUD. Throughout the study, participants wore an ActiWatch Activity Monitor that measured: sleep duration, sleep efficiency, and wake time. We conducted repeated-measures ANOVA to examine the effects of gabapentin (0mg vs 1800mg) on sleep after nine laboratory sessions where oxycodone (0mg, 15mg, 30mg), alcohol (placebo, 0.5g/kg, 0.75 g/kg) and combined doses were administered orally.

Results: Under placebo drug conditions (0mg oxycodone, placebo alcohol) and at highest doses (30mg oxycodone, .75 g/kg alcohol) 1800mg gabapentin was associated with significantly less wake time compared with 0mg gabapentin ($p < .01$). 1800mg gabapentin was also associated with significantly less wake time after a combined dose of oxycodone (30mg) and alcohol (.5g/kg) compared to 0mg gabapentin ($p < .01$). A similar effect emerged for sleep efficiency but did not reach statistical significance. No significant effects were observed for sleep duration.
Conclusions: Gabapentin reduced total wake time under placebo alcohol and opioid doses and at high doses of each. Gabapentin also appeared to be associated with greater sleep efficiency across drug dosing conditions, though this effect was not statistically significant. Gabapentin may attenuate the negative effects of opioids and alcohol on sleep, though further work is needed to examine this relationship.

M101. Attentional Bias for Opioid and Pain Cues in Opioid Use Disorder

Robert MacLean[*1], Alicia Heapy[1], Mehmet Sofuoglu[2]*
[1]VA Connecticut Healthcare System, [2]Yale University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: To evaluate the associations between attentional bias (AB) for opioid and pain cues with measures of opioid craving and pain in a Veteran population with opioid use disorder (OUD) and chronic pain.
Methods: Using baseline data from an ongoing study, 25 Veterans (88% male) with OUD and chronic pain receiving opioid agonist treatment (i.e., methadone or buprenorphine) completed an AB task (visual probe) with 160 trials consisting of pairs of neutral words with either opioid or pain-related words. Participants also completed measures including the Brief Pain Inventory (BPI) and Desires for Drug Questionnaire (DDQ). After completing AB task and measures, participants completed ecological momentary assessment (EMA) smartphone surveys 3x/day for 7 days. Survey items related to opioid craving and pain intensity (both 0-10) were averaged over the baseline week. Preliminary analysis evaluated presence of AB by cue type and associations with measures of craving and pain.
Results: The average AB for opioid and pain cues were -6.1 ms (SD=40.2) and 3.3 ms (SD=53.0), respectively. One sample t-tests suggest neither AB cue type was different from zero (both p values > 0.4). Bivariate correlations revealed significant positive associations between EMA pain intensity and BPI intensity and interference (both ps < .01). Significant positive associations were also observed between EMA craving and DDQ and BPI interference (ps < .01). Pain AB was associated with BPI intensity ($r = 0.42$, $p = .03$). No associations were found with opioid AB.
Conclusions: Preliminary findings suggest concordance between the baseline measures of opioid craving and pain and the weekly average of EMA assessment of these outcomes. There are also significant associations with craving and pain interference, but not pain intensity. AB scores for either pain or opioid cues are not significantly different than zero; however, greater pain AB seems to be related to greater baseline pain intensity.

M102. Optimizing Emergency Department (ED) and Community-Based Linkages to Support Ed-Initiated Buprenorphine: A Focus Group Study in Four U.S. Cities

Ryan McNeil[*1], Kathryn Hawk[2], Gail D'Onofrio[1], Marek Chawarski[1], Patrick O'Connor[1], Edwin Salsitz[3], Robert Schwartz[4], Judith Tsui[5], Christine Wilder[6], David Fiellin[1], E. Jennifer Edelman[1]*
[1]Yale University School of Medicine, [2]Yale University, [3]Mount Sinai Beth Israel, [4]Friends Research Institute, [5]University of Washington, [6]University of Cincinnati
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: To reduce morbidity and mortality among individuals with untreated opioid use disorder (OUD), there has been growing attention to implementation of emergency department (ED)-initiated buprenorphine with referral to community-based treatment providers. These efforts require the development of successful linkages to community-based providers. This qualitative study explored the perspectives and experiences of community-based treatment providers (physicians, nurses, social workers, advanced practice providers, administrators) in four cities

(New York, Baltimore, Cincinnati, Seattle) with ongoing efforts to implement ED-initiated buprenorphine with referral for ongoing treatment.
Methods: Between April 2018 and January 2019, 13 focus groups were conducted with community-based treatment providers identified by urban academic emergency departments as referral sites for ED-initiated buprenorphine implementation. Focus groups were conducted as part of Project ED Health (CTN--069), an ongoing hybrid type III effectiveness-implementation study evaluating the impact of implementation facilitation on ED-initiated buprenorphine. Focus groups were transcribed and analyzed by multiple team members using deductive and inductive approaches.
Results: Findings indicate that, even as linkages between EDs and community-based treatment providers are being developed and operationalized for ED-initiated buprenorphine, these efforts are shaped by social-structural dynamics operating within the community-based programs. Characteristics of local health care systems, including social values concerning medication-based treatment (e.g., perspectives on MOUD), resource availability (e.g., availability of community-based treatment, grant support), flexibility in intake process and medication access for new patients, were critical in determining local capacity to accept patients who had received ED-initiated buprenorphine and the degree of patient-centeredness associated with the referral process and ongoing care. Further, the socio-economic marginalization experienced by people with OUD, including poverty, housing vulnerability, and insurance status, were perceived to shape the optimization of ED-initiated buprenorphine.
Conclusions: Addressing social-structural conditions in community-based treatment settings, including through increasing available resources and addressing structural determinants of health, may be necessary to optimize implementation of ED-initiated buprenorphine.

M103. Family History and Current Prescription Drug Misuse in U.S. Adults 50 and Older

Ty Schepis[1], Sean McCabe*[2]
[1]Texas State University, [2]University of Michigan
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: A positive family history of alcohol/substance use problems (FH+) is a risk factor for substance use problems, but the influence of family history on prescription drug misuse (PDM) has not been well-examined. Our aim was to investigate prevalence rates of lifetime and past year PDM by family history status and whether PDM-mental health and PDM-SUD relationships vary by family history status in US adults 50 and older.
Methods: Data were from the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III; n = 14,704). Measures included lifetime and past-year PDM, DSM-5 SUDs, and DSM-5 psychiatric diagnoses. FH+ status was defined as a family member who was an “alcoholic or problem drinker” or had a “drug use problem”, with five DSM-5 AUD/SUD symptoms to cue respondents. Weighted cross-tabulations estimated prevalence rates and logistic regression was used to compare family history groups, controlling for sociodemographics.
Results: FH+ status was associated with significantly higher rates of lifetime and past-year opioid (10.2% and 3.8%) or tranquilizer/sedative PDM (7.8% and 2.0%), versus individuals without a family history (FH-; 4.4% and 1.7%; 3.4% and 1.0%, respectively). Rates of lifetime or past-year SUD from PDM were higher in FH+ than FH- adults ($p < 0.001$). Finally, rates of lifetime SUDs (e.g., AUD odds ratio= 3.08, 95% CI= 2.11-4.08) and psychopathology (e.g., PTSD odds= 2.83, 95% CI= 1.38-5.80) were significantly higher in those engaged in lifetime PDM who were also FH+, versus those with PDM who were FH-.
Conclusions: FH+ status is a risk factor for PDM and SUD from PDM in US adults 50 and older. In those engaged in PDM, rates of other SUDs and psychopathology are higher among FH+ than FH- individuals. This suggests assessment of family history can highlight potential PDM and greater co-occurring SUD and psychopathology among those engaged in PDM.

M104. The Impact of COVID-19 on the Delivery of Medication Treatment for Opioid Use Disorder From the Perspective of Substance Use Treatment Providers

Sarah Clingan[1], Lin Chunqing[1], Sarah Cousins[1], Jon Valdez[1], Larissa Mooney[1], Yih-Ing Hser[1]
[1]University of California, Los Angeles
Abstract Detail Human

Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: The purpose of this study was to assess the impact of the coronavirus (COVID-19) pandemic on the delivery of medication for opioid use disorder (MOUD) from the perspective of substance use disorder treatment providers.
Methods: Thirteen focus groups were conducted from May to September 2020 with 15 substance use treatment sites in a large urban county in preparation for a new study assessing a patient decision aid for MOUD. All focus groups were conducted virtually and lasted about an hour. All focus groups were recorded, and participants received $100 for their participation. The study utilized a systematic approach to data analyses where two qualitative analysts independently conducted a content analysis of the transcripts and then compared and consolidated identified themes.
Results: Most outpatient clinics did not observe an extreme fluctuation of patient flow due to COVID-19, and any decline of patient admissions at the beginning of the pandemic increased to baseline or above after a few months. Specifically, inpatient treatment providers noticed an increase in admissions since COVID-19 related to mental health issues, alcohol use, and relapse among their patient population. Due to COVID-19, many of the clinics reported more flexible delivery of services such as curbside dosing and reduced in-person visits. Telehealth was also offered in approximately half of the clinics, with a majority of patients preferring to use telephone vs. video services. Providers reported that internet access and technical difficulties limited the use of video-based telehealth among their patients.
Conclusions: COVID-19 has been challenging for MOUD, but the relaxation of regulations for the delivery of MOUD and the use of telehealth-based services ensured uninterrupted patient care during the public health crisis. However, providers need organizational, technical, and logistical support to provide quality care and telehealth services for their patients.

M105. Introduction of Telemedicine in an Opioid Treatment Program Utilizing Buprenorphine: Patient Perspectives

Scott Farnum[1], Erica Cannata[1], Gretchen Hermes[2], Declan Barry[2], Lynn Madden[2]*
[1]APT Foundation, Inc., [2]Yale School of Medicine and APT Foundation, Inc.
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Since the beginning of the COVID-19 pandemic in January 2020 challenges to the delivery of healthcare are widely noted. One innovation seen as a potential solution to limiting in person visits is telehealth. The aim of this study looks at patient perspectives of providing buprenorphine (BUP) via telephonic, non-video, telemedicine within an opioid treatment program (OTP).
Methods: 205 patients of APT foundation, an OTP providing buprenorphine/naloxone (BUP/NX) in treatment of opioid use disorder (OUD), were surveyed as part of a quality improvement project. This 8-question survey gathered information regarding their experience receiving medication for OUD (MOUD) via telehealth during pandemic conditions. Six survey questions were answered yes (Y) or no (N) yielding percentages, and 2 questions elicited responses descriptive of patients experiences yielding qualitative data.
Results: The average age is 43, 112 male, 93 female, 78% white, 15% Hispanic and 5% black. 7% had previous experience with telemedicine. 100% indicated satisfaction with telephonic services. 81% responded that after pandemic conditions ease, they would prefer to continue to be able to access telemedicine. 29% felt that adding a video component would enhance treatment. 91% endorsed telemedicine as equally effective as face-to-face sessions. 32% would be interested in participating in video groups. Comments related to what went well include, “convenient”, “feels safer”, “less travel”. Comments related to problems with telemedicine, “sometimes hard to get through”, “delay in getting my prescription”, “not knowing if I should leave a message”.
Conclusions: Patients in an OTP receiving telemedicine services report overwhelming satisfaction with the effectiveness and convenience of receiving treatment in this manner. They demonstrate an interest in continuing to receive telemedicine services post-pandemic. Dissatisfaction was expressed towards communication difficulties. Future research should examine possible negative and positive impacts on treatment outcomes with persons receiving MOUD via telemedicine.

M106. Preliminary Evaluation of a Peer Workforce Training Program to Address the Opioid Crisis

Sierra Castedo de Martell[1], J. Michael Wilkerson[2], Sheryl McCurdy[2], Jialing Zhu[3], Jason Howell[4]*
[1]UTHealth School of Public Health, [2]University of Texas Health Science Center, [3]The University of Texas Health Science Center at Houston, [4]RecoveryPeople

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: Peer recovery support services are an evidence-based intervention to address substance use disorder (SUD) across a variety of settings and populations, but little is known about barriers and opportunities to training new peer workers. We analyzed data from a peer worker training program to identify barriers to certification and job placement.
Methods: Prospective peer workers applied for a scholarship that covered the cost of training as well as a stipend for the 250 work experience hours required for certification. A total of 236 individuals applied between January 14 and December 1, 2020, including both sexes. Of these, 96 received a scholarship, 81 completed classroom training and 30 advanced to the internship experience at the time of analysis. Demographic, life history and recovery experience measures were collected at baseline, and psychosocial measures were collected at baseline and immediately post-training. This study assessed pre- and post-training changes in psychosocial measures, associations between key demographic, life and recovery history variables and advancement in the certification process, as well as baseline psychosocial states.
Results: Having a history of low socioeconomic status, being in an underserved area, and having dependents were significantly associated with applicants not advancing to training or work experience placement during the pandemic. Conversely, past institutionalization, a family history of SUD, and previous engagement with a recovery community center were significantly associated with applicants advancing to training and work experience placements. Barriers to becoming certified during a pandemic include personal and community resources, but some life history challenges (institutionalization, incarceration) may act as facilitators in this group.
Conclusions: Individuals from disadvantaged backgrounds who have experienced multiple life challenges require additional support to complete the training and work experience requirements necessary to become certified and enter the workforce. It is possible having dependents would not be significant post-pandemic.

M107. Smoking Exceeds Injecting Opioids: Examining Prevalence and Correlates of Smoking Opioids in British Columbia

Stephanie Parent[1], Kristi Papamihali[2], Brittany Graham[2], Jane Buxton[2]*
[1]Queen's University Faculty of Medicine, [2]British Columbia Centre for Disease Control

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research

Aim: British Columbia (BC) is in the midst of an overdose crisis. Since 2017, smoking illicit drugs became the leading route of drug administration causing overdose death. Yet, little is known about people who smoke opioids, and factors underlying choice of drug route of administration. The objectives of this study are to identify the prevalence and correlates associated with smoking opioids.
Methods: The Harm Reduction Client Survey is a monitoring tool used by the BC Centre for Disease Control since 2012. This survey is disseminated across harm reduction sites in BC to understand trends among people who use drugs and drug-related harms. This study examines data from the latest survey iteration, administered October-December 2019; we perform descriptive, univariate, and multivariate analyses to better understand the factors associated with smoking opioids.
Results: A total of 369 people who use opioids were included, of which 251 (68%) reported smoking opioids in the past 3 days, while 172 (46.6%) injected opioids. A total of 109 (29.5%) experienced an overdose, of these 79 (72.5%) smoked opioids. Factors significantly associated with smoking opioids were: living in a small community [Adjusted Odds Ratio (AOR) = 2.41, Confidence Intervals (CI) =1.27-4.58], male gender (AOR = 1.84, CI=1.03-3.30), age under 30 (AOR = 5.41, CI=2.19-13.40) or 30-39 (AOR = 2.77, CI=1.33-5.78) compared to age ≥50,

using drugs alone (AOR=2.98, CI=1.30-6.83), and owning a take-home naloxone kit (AOR = 2.01, CI=1.08-3.72). Concurrent use of crystal meth was strongly associated with smoking opioids (AOR= 6.48, CI=3.51-11.96).
Conclusions: Our findings highlight important correlates associated with smoking opioids, particularly the concurrent use of crystal meth. These findings can support concrete actions to better respond to the opioid crisis, such as targeting harm reduction approaches, educating on the risks of smoking opioids, and advocating for consumption sites where people can smoke drugs.

M108. Pharmacological Comparisons of Mitragynine, 7-Hydroxymitragyine, and Mitragynine Pseudoindoxyl

Takato Hiranita[*1], Samuel Obeng[1], Francisco Leon[1], Marco Mottinelli[1], Lea Gamez Jimenez[1], Luis Restrepo[1], Avi Patel[1], Nicholas Ho[1], Manuel Alvarez[1], Amsha Thadisetti[1], Elizabeth Kern[1], Victoria Pallares[1], Christopher McCurdy[1], Lance McMahon[1]*
[1]University of Florida, College of Pharmacy
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Our group has demonstrated that the Mitragyna speciosa (kratom) alkaloid mitragynine (MG) is metabolized in vivo into 7-hydroxymitragynine (7-OH-MG), which is in turn converted into MG pseudoindoxyl (MG-P).
Methods: Here we compared their μ-opioid receptor (MOR) pharmacology.
Results: In vitro displacement of [3H]DAMGO at human MOR yielded the rank order potency (Kis in nM) of MG-P (1.5) > morphine (4.0) > 7-OH-MG (78) > MG (709). Stimulation of [35S]GTPγS binding yielded the rank order efficacy (% stimulation normalized to DAMGO) of morphine (92) > 7-OH-MG (46) > MG-P (32) > MG (4.0). In rats discriminating morphine (3.2 mg/kg, i.p.), morphine, 7-OH-MG and MG-P produced 100% drug-lever responding; MG produced a maximum of 72% drug-lever responding. The rank order potency (ED50s in μmol/kg, i.p.) was MG-P (0.47) > 7-OH-MG (0.66) > morphine (2.4) > MG (68). Rank order potency to decrease rates of responding was 7-OH-MG (11) > morphine (18) > MG-P (24) > MG (105). Using hotplate (52°C) response latency to assess antinociception, the % maximum possible effects (and corresponding ED50s in μmol/kg) were 93% (46) for morphine, 7% for MG, 78% (26) for 7-OH-MG, and 23% for MG-P. In rats discriminating MG (32 mg/kg, i.p.), the maximum drug-lever responding was 70% for morphine and greater than 98% for MG, 7-OH-MG and MG-P. Rank order potency for MG-like discrimination (ED50s in μmol/kg) was MG-P (0.93) > 7-OH-MG (1.0) > morphine (21) > MG (35). The opioid antagonist naltrexone (0.085 μmol/kg, i.p.) antagonized MG discrimination as well as the morphine-like effects of 7-OH-MG and MG-P.
Conclusions: These results strongly suggest that all three kratom alkaloids are MOR agonists in vivo, with the intrinsic activity of 7-OH-MG being greater than both MG and MG-P.

M109. Laboratory-Induced Stress and Craving Predict Opioid Use During Follow-Up Among Individuals With Prescription Opioid Use Disorder

Tanya Saraiya[*1], Amber Jarnecke[1], Jennifer Jones[1], Delisa Brown[1], Kathleen Brady[1], Sudie Back[1]*
[1]Medical University of South Carolina
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Opioid use disorder (OUD) remains a public health crisis in the USA. Although stress and craving are common precipitants of substance use, no research to date has investigated the impact of laboratory-induced stress and craving on subsequent opioid use. We hypothesized that higher subjective and neuroendocrine reactivity in response to a laboratory-induced stress task and an opioid cue paradigm would be associated with a shorter time to opioid use and a greater amount of opioid use.
Methods: Individuals with prescription OUD (N=31; 54.8% male) completed a human laboratory study followed by a one-month follow-up visit. Participants were randomly assigned to either a stress task (i.e., Trier Social Tress Task; TSST) or a no-stress condition, and then all participants completed an opioid cue paradigm. Measures of subjective (e.g., stress, craving), and neuroendocrine (e.g., cortisol, dehydroepiandrosterone) reactivity were

assessed before and after each task. Survival and regression models tested the association between reactivity to the laboratory tasks and a) time to first opioid use and b) amount of opioid use during follow-up.
Results: Participants first used opioids M=3.65 (SD=2.08) days following the study. Craving after the opioid cue paradigm (B=0.44, Exp(B)=1.55, 95% CI [1.06, 2.28], p=.02) and after the TSST/no-stress condition plus opioid cue paradigm (B=1.06, Exp(B)=2.88, 95% CI [1.70, 4.85], p < .001) predicted time to first use. Additionally, there was a significant interaction between randomization to the TSST, stress reactivity, and amount of opioids used (B=-0.78, SE=0.32, ß=-.85, p=.02). The amount of opioids used at follow-up varied by subjective stress response to the TSST.
Conclusions: Findings demonstrate that elevated cue-induced craving, either in the context of a stressor or not, is associated with shortened time to opioid use, whereas stress reactivity impacts the amount of opioids consumed. Preliminary findings add to literature on stress, craving, and opioid use and implicate treatment.

M110. Trend Analysis of Changes in Social Stigma Towards Opioid Misuse Pre-COVID and During COVID

Bruce Taylor[*1], Poulami Maitra[1], Phoebe Lamuda[1], Harold Pollack[2], John Schneider[2]*
[1]NORC at the University of Chicago, [2]University of Chicago
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Other
Abstract Category Original Research
Aim: This paper explores the extent to which the general adult population holds stigmatizing views towards opioid misuse. We explore changes from immediately before the COVID-19 pandemic and across three time points during the COVID-19 pandemic.
Methods: A random stratified sample was drawn from the AmeriSpeak's® web-based panel. Participants (n ~ 1,000 per wave) were general population adults ages 18 and older who completed a self-report survey on social stigma towards opioids misuse. National surveys were done in Feb., May, June, and October 2020. Generalized mixed models and other trend analyses were done exploring changes in public stigma towards those using opioids controlling for demographics, personal and family/friend experience with opioids and the criminal justice system, disregard for opioid use disorder as a medical condition, and perceptions of opioid misuse as a crime.
Results: Results from the Wave 1 survey suggest that 13% of the participants self-reported ever misusing opioids, 3% reported an opioid overdose, and 13% reported personal experience with the CJ system. On average, the general adult population moderately endorses stigmatizing behaviors, agrees that opioid misuse is a medical condition, agrees with policies to increase access to treatment, and is less likely to endorse opioid misuse as a crime. Having a disregard for opioid misuse as a medical condition was most associated with higher levels of stigma, endorsing opioid misuse as a crime, and disagreeing with policies to help people access opioid misuse treatment. The paper will present all four waves of data and model trends in opioid social stigma over time.
Conclusions: The data from this paper can help provide guidance to policymakers concerning individuals with certain characteristics to target for public education efforts to reduce stigma and draw more support for public heath interventions for opioid misuse.

M111. "I'll Do What I Got to Do To, Just To Keep Safe" – Patient Perceptions of COVID-19 Pandemic Policy Changes and Recovery Support at Opioid Treatment Programs in Rural Oregon

Ximena Levander[*1], Kim Hoffman[1], Chantell Smith-Graves[2], Gregory Brigham[2], John McIlveen[3], Dennis McCarty[1], Javier Ponce Terashima[4], P. Todd Korthuis[1]*
[1]Oregon Health & Science University, [2]Adapt, [3]Oregon Health Authority, [4]University Hospitals Cleveland Medical Center
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: Due to the COVID-19 public health emergency, federal agencies announced in March 2020 regulatory changes around take-home methadone dispensing at opioid treatment programs (OTPs) in order to improve access to addiction treatment and ensure patient and staff safety. We explored OTP patient perceptions on how these

announcements were received and implemented in rural communities and how the policy adjustments and the COVID19 pandemic impacted their addiction treatment and recovery.
Methods: Semi-structured one-on-one qualitative interviews were completed between August and October 2020 with 22 patients with varying take home methadone frequencies from 3 rural OTPs in Oregon. All interviews were conducted via phone, audio-recorded, and transcribed verbatim. Transcriptions were coded at the semantic level, with codes generated both deductively and inductively. We analyzed data using directed content analysis in an iterative process for themes.
Results: Our analysis revealed four main themes: 1) Balancing safety from COVID-19 infection with priority of managing OUD, 2) Navigating rule changes as the pandemic progressed, 3) Adjusting to support and counseling via telemedicine/virtual platforms and 4) Recognizing future opportunities in OTP policies post-pandemic. Participants reported following clinic and state recommendations to avoid SARS-Co-V2 infection and prevent transmission to family or other OTP patients. Some noted how OTPs were reversing blanket exceptions to methadone take home dosing made earlier in the pandemic, despite feeling things were currently "more risky." Telemedicine and virtual groups were "basically the same" as in-person encounters for some. However, others expressed strong preference for "face to face" visits and some preferred phone, independent of COVID-19 safety concerns. Participants desired a "return to normal" but also wanted more flexibility around future policies.
Conclusions: The COVID-19 pandemic highlights the resilience of patients with OUD in adjusting to changing procedures to maintain needed services and engagement in treatment. Participants voiced desire for input in future OTP policies.

M112. Assessment of Online Content Discussing Initiation, Switching, and Cessation of Pharmaceutical Opioids

Zachary Margolin[*1], Richard Olson[1], Joshua Black[1], Kevin Wogenstahl[2], Richard Dart[2]*
[1]Rocky Mountain Poison & Drug Safety, [2]Rocky Mountain Poison & Drug Center
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Online data increasingly contributes to public health research and pharmacovigilance. The objective of this analysis is to describe the behaviors discussed online regarding transition between drug products among opioid users transition behaviors.
Methods: The RADARS® System Web Monitoring Program collects web content related to the use of pharmaceuticals. Over 150 million publicly available websites were scraped from 2019Q3 to 2020Q2 for posts mentioning hydrocodone, morphine, oxycodone, and oxymorphone. A stratified random sample of posts was qualitatively analyzed for transitional behavior in drug use (e.g. initiation or cessation, drug switching), perceived effectiveness of the transition, and other drugs involved.
Results: Of 5,945 total sampled posts, 83 (1.4%) discussed transition behavior for a drug of interest, with little variation by opioid. Of the 83 posts, 22 (26.5%) described transitioning to a prescription opioid from another drug, 28 (33.7%) described transitioning away from an opioid to another drug, and 33 (39.8%) described cessation of use.
Among online authors who discussed initiating an opioid, all cases involved transitioning from a different prescription opioid (effective = 4, ambiguous = 12, ineffective = 6). Of the 28 authors who transitioned away from opioids, 15 transitioned to a different opioid (effective = 1, ambiguous = 9, ineffective = 5), 8 transitioned to a cannabinoid (effective = 6, ambiguous = 1, ineffective = 1), 4 to an OTC product (ambiguous = 4), and 1 author transitioned to kratom (neutral = 1).
Conclusions: Results show that, although drug use is often discussed online, content about switching between drugs is rare. Posts discussing transitioning to or from an opioid most frequently named another opioid. Notably, switching to cannabis was seen as effective for pain in 6 out of 8 cases. Ultimately, public internet posts may not contain sufficient data to quantify generalizable patterns of drug switching behavior.

Virtual Poster Q&A Session I: Polydrug

M113. Understanding Concurrent Use of Uppers and Downers Among People Who Use Drugs in British Columbia, Canada: Findings From a Mixed Method Study

Abigail Steinberg[1], Christine Lukac[1], Amiti Mehta[2], Kristi Papamihali[2], Hafsa Sadiq[3], Brittany Graham[2], Jane Buxton[2]*
[1]University of British Columbia Faculty of Medicine, [2]Harm Reduction Services, BC Centre for Disease Control, Vancouver, BC, Canada, [3]Faculty of Health Sciences, Simon Fraser University, Burnaby, BC, Canada
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Harm Reduction
Abstract Category Original Research
Aim: The recent three-fold increase in methamphetamine (MA) use in British Columbia (BC), Canada, parallels concurrent use of MA and opioids across North America. Concurrent use refers to the use of MA and opioids (i.e. uppers and downers) one after the other or together. Concurrent use can increase the risk of non-fatal overdose with long-term consequences and opioid overdose death. Our mixed methods study aims to understand factors associated with increased concurrent use, to identify interventions within the context of the opioid overdose epidemic.
Methods: Analyses were completed with data from the 2019 Harm Reduction Client Survey collected from 621 individuals across 22 harm reduction sites in BC. The thematic analysis assessed in what order and why people use concurrently, and the multivariable logistic regression assessed predictors of concurrent use.
Results: Of the 307 individuals who reported using drugs concurrently, 179 (58.3%) used downers then uppers; 76 (24.8%) used uppers then downers; and 184 (59.9%) mixed uppers and downers together. The main reasons for concurrent use were self-medication, availability and preference, drug effects/properties, and funds/life situation. Compared to individuals who use MA and/or opioids separately, the odds of concurrent use decreased with every one-year increase in age (OR=0.97, 95%CI 0.95-0.99) and among individuals with paid work (OR=0.58, 95%CI 0.34-0.99). While the odds of concurrent use increased among individuals who used drugs daily (OR=3.69, 95%CI 2.23-6.20), experienced an opioid overdose (OR=1.83, 95%CI 1.02-3.37), had a naloxone kit (OR=1.94, 95%CI 1.16-3.26), and used safe consumption sites (OR=2.57, 95%CI 1.61-4.12).
Conclusions: The ongoing rise in opioid overdoses in BC is multifactorial, and the recent parallel increases in MA use and concurrent use with opioids may contribute. Addressing this issue through harm reduction strategies and education may impact the rates of overdose morbidity and mortality. Qualitative interviews may further elucidated reasons for concurrent use.

M114. Use of Mobile Technology to Support Recovery From Substance Use Disorders

Ashlin Ondrusek[1], Adam Viera[1], Cecil Tengatenga[1], Erin McBurney[1], John Lauckner[2], Emma Tran[1], James Richey[1], Christine Simon[3], Carolyn Lauckner[2], Jessica Muilenberg[2], Trace Kershaw[1]*
[1]Yale School of Public Health, [2]University of Georgia, [3]Yale School of Medicine
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: This project aimed to identify how individuals in substance use treatment use mobile phones to support their recovery from substance use disorders as well as how the use of mobile phones interferes with recovery in order to determine the feasibility and acceptability of mHealth interventions providing ongoing support after substance use treatment.
Methods: We conducted 30 semi-structured in-depth interviews with individuals in SUD treatment in September and October of 2019. Half these interviews were held in a small urban area in southcentral Connecticut, and half in a rural area in northeastern Georgia. These interviews explored how participants use mobile phone technology to support their recovery as well as perspectives on how different features of mobile phone technology (e.g., GPS tracking) could be used to support them. Thematic analysis was used to identify themes related to the research aims described above.
Results: We identified three themes. Participants: 1) primarily use mobile technology to connect with supportive friends and family via phone, text, and messaging apps; 2) express interest in receiving daily technology-based support (e.g., supportive texts) or mechanisms for promoting accountability (e.g., daily or triggered messages), especially if tailored to prompt based on location and informed by place-based triggers for substance use; and 3) would benefit from apps that connect them to local resources, such as open support groups.

Conclusions: Mobile phone apps present an opportunity to offer ongoing support to individuals completing SUD treatment. Future research should explore the development and effectiveness of smartphone apps that support recovery among individuals with SUD by connecting them to real-time recovery supports and that incorporate elements of daily accountability and trigger-based relapse prevention messaging. This work serves as formative research for the development of an app to provide location-based support messaging to individuals experiencing co-occurring alcohol and opioid use.

M115. Race, Ethnic, and Sex Differences in Prevalence of Hallucinogen Consumption Among Lifetime Users in the United States

Alan Davis[*1], Brooke Arterberry[2], Yitong Xin[1], Gabrielle Agin-Liebes[3], Monnica Williams[4]*
[1]The Ohio State University, [2]Iowa State University, [3]University of California, San Francisco, [4]University of Ottawa

Abstract Detail Human
Select Drug Category Psychedelics
Topic Epidemiology
Abstract Category Original Research

Aim: Examine race, ethnic, and sex differences in the prevalence of hallucinogen consumption among lifetime hallucinogen users in the United States.

Methods: Data came from the 2018 National Survey on Drug Use and Health (NSDUH; N=8,154; female=43%; Black=6%; Native American=2%; Pacific Islander=<1%; Asian=2%; Multiracial=5%; Hispanic=12%). Descriptive and multinomial logistic regression analyses were conducted with weighted data.

Results: Among those that reported ever using hallucinogens, most people reported lifetime psilocybin, Lysergic acid diethylamide (LSD), or 3,4-Methylenedioxymethamphetamine (MDMA) use compared to other hallucinogens. Approximately 10% of Black, Asian, and Multiracial males reported past month hallucinogen use, which was at least two-to-three times larger than proportions in other race/ethnic/sex groups. About two-thirds or more of White males and Pacific Islander females had ever used psilocybin or LSD, whereas less than one-third of Black males/females and Pacific Islander males reported lifetime psilocybin use, and less than one-third of Black females reported lifetime LSD use. Over one-half of Black males/females, Pacific Islander and Asian males, and Hispanic males/females reported lifetime MDMA use. Use of peyote and mescaline was highest among Native Americans. Dimethyltryptamine use was highest among White males, Multiracial females, and Hispanic males/females. Black, Asian, and Multiracial people had an increased odds of past-year (ORs=1.22-2.04; ps<.05) and past-month (ORs=1.48-1.93; ps<.05) hallucinogen use, Black and Asian people had increased odds (ORs=1.61-1.62; ps<.05) of lifetime MDMA use, and Native Americans had an increased odds (OR=8.19; p<.05) of lifetime peyote use, compared to White people. Women had lower odds of past-year (OR=0.85; ps<.05), past-month (OR=0.85; ps<.05), and lifetime use of all hallucinogens (ORs=0.53-0.72; ps<.05) compared to males, except for lifetime use of MDMA (OR=1.29; ps<.05).

Conclusions: These data should be used to inform public health and clinical practice. Future research is needed to explore psychosocial and health factors associated with hallucinogen use among females and racial/ethnic minorities.

M116. Identifying the Needs of Urban Indian Behavioral Health Programs During COVID-19

Anne Skinstad[*1], Clyde McCoy[2], Noah Segal[1], Korrine Rodrigue[3], Jeanene Bengoa[3], Megan Dotson[1]*
[1]University of Iowa, [2]Comprehensive Drug Research Center, [3]University of Miami

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research

Aim: The National American Indian and Alaska Native Mental Health Technology Transfer Center conducted key informant interviews throughout the US over a four-month period with Urban Indian Health Programs (UIHPs) across the United States. The purpose was to assess programming and how behavioral health and addiction services have been impacted during the COVID-19 pandemic. The information gathered will guide training and technical assistance to better meet the needs of behavioral health providers during the pandemic.

Methods: Participants were selected from the list of 42 UIHPs utilizing a randomization sampling methodology. One-on-one telephone interviews were conducted (N=21) over a 60-minute period. Inclusion criteria were volunteers over 18 years of age serving Native clients with behavioral health or substance use disorders. These confidential interviews focused on: 1) staff perceptions of delivery and barriers to service, 2) how the COVID-19 pandemic has affected services, 3) availability of tribal behavioral health programs during the pandemic, and 4) what are the biggest needs and challenges during the pandemic.
Results: Notable topics that emerged from the interviews include disruptions due to COVID-19, the implementation of new strategies to care for staff, and pivots in service delivery. All organizations also discussed positive outcomes in the wake of the pandemic such as increased participation and decreased no-show rates. However, most communities served are struggling financially due to COVID-19 and fulfilling basic needs was quoted as the greatest challenge in their organizations.
Conclusions: Despite the challenges caused by the COVID-19 pandemic, UIHPs have implemented creative ways to continue to serve Native populations in urban centers. Most providers found that telehealth systems worked well and, in some regards, made clients more compliant with services and reduced barriers to care. However, Native communities, and organizations serving them, are still struggling to meet their clients' basic needs.

M117. Assessing the Impact of the Office of Research on Women's Health 2010 Strategic Plan: Changes in Research on Substance Use Interventions for Pregnant Women From 2000 to 2019

Anthony Oliver[*1], Sarah Heil[1]*
[1]*University of Vermont*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Policy
Abstract Category Original Research
Aim: Pregnant women have been underrepresented in research due to safety and ethical concerns. To help address this disparity, the 2010 strategic plan of the Office of Research on Women's Health (ORWH) included an objective encouraging research on safe and effective interventions for conditions affecting pregnant women. We were interested in whether there was an increase in research testing interventions to reduce licit or illicit substance use among pregnant women in response to the 2010 ORWH strategic plan. To test this, we compared the number of randomized controlled trials (RCTs) published in the 10 years before and after the ORWH report. We also recorded the substance(s) targeted by each intervention and information about efficacy.
Methods: Ovid MEDLINE® was searched for peer-reviewed journal articles from the years 2000 to 2019. Only articles that were in English and reporting on an intervention designed to reduce substance use among pregnant women were eligible for inclusion.
Results: The search returned 579 articles, 51 of which reported on RCTs. Twenty-three of the 51 (45%) were published between 2000 and 2009 whereas 28 (55%) were published between 2010 and 2019. Across time, the majority (62%) of the interventions were focused on smoking cessation, with alcohol use a distant second (15%). Only about one third (31%) of the interventions were efficacious.
Conclusions: There was a slight increase in the number of RCTs on substance use interventions among pregnant women following the ORWH's 2010 strategic plan. The efforts to reduce smoking during pregnancy are well-placed given the adverse consequences and relative prevalence of cigarette smoking during pregnancy, but it is unclear why there are not parallel efforts for alcohol use given well-documented adverse consequences and a similar prevalence. The relatively low rate of efficacy across interventions underscores the need to continue to encourage more research in this area.

M118. Concomitant Cannabis Misuse and Associations With Depression, Pain, and Substance Misuse Among Patients Prescribed Opioids

M. Aryana Bryan[*1], Elizabeth Charron[1], Jennifer Brown[2], Andrew Ferguson[2], Gerald Cochran[1]*
[1]*University of Utah*, [2]*University of Cincinnati*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Health Services
Abstract Category Original Research

Aim: Cannabis use is being explored in the treatment of a myriad of health conditions; however, potential risks associated with cannabis use among patients who take opioids are unclear. In this exploratory analysis, the relationship was evaluated between cannabis use and depression, pain, overdose, and other substance use among community pharmacy patients who filled opioids in Ohio and Indiana.
Methods: This study utilized a single-group, cross-sectional health assessment among adults (N=1,523) filling opioid prescription(s) within community pharmacies (N=19). Cannabis and other substance use was identified using the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). Depression was screened using the Patient Health Questionnaire-2 (PHQ-2); pain was measured using the Brief Pain Inventory (BPI); history of overdose was assessed by the Overdose Experiences, Self and Witnessed – Drug (OESWD). Binary and multinomial logistic regression models, adjusted for demographics, self-reported health status, and pharmacy site, were used to assess associations between moderate/severe cannabis use and depression, pain, and substance use metrics.
Results: A total of 166 (11.6%) participants reported moderate/severe cannabis use. In covariate-adjusted regression analyses, moderate/severe cannabis use was positively associated with depression risk (adjusted odds ratio [aOR]= 1.85, 95% confidence interval [CI]=1.23-2.71); history of overdose (aOR=2.66, 95% CI=1.71-4.15); and moderate/severe use of alcohol (aOR=2.59, 95% CI=1.62-4.16), opioids (aOR=1.97, 95% CI=1.39-2.80), stimulants (aOR=5.40, 95% CI=3.35-8.72), sedatives (aOR=2.60, 95% CI=1.79-3.78), tobacco (aOR=3.75, 95% CI=2.61-5.39), and other illicit drugs (aOR=4.96, 95% CI=2.16-11.4). Moderate/severe cannabis use was not significantly associated with pain severity or pain interference in the sample.
Conclusions: Cannabis use among pharmacy patients prescribed opioids is associated with higher depressive symptoms and moderate/severe use of other substances. As the prevalence of cannabis use in self-management of pain and other health conditions increases, greater understanding of the risks associated with concomitant opioid and cannabis use will be important in guiding pharmacists addressing behavioral health concerns among patients.

M119. Sex Based Differences in an Addiction-Focused Phenotyping Assessment Battery

Caitlin Martin[*1], Lori Keyser-Marcus[1], Leroy Thacker[1], F. Gerard Moeller[1]*
[1]Virginia Commonwealth University

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: Precision medicine approaches are urgently needed in substance use disorder (SUD) treatments but are not possible without first having a clinically feasible psychometric evaluation tool. Sex is an important variable that modifies SUD trajectories, but no sex-informed neurobehavioral classification exists for SUD. The primary objective was to measure the extent to which sex modifies the associations between neurobehavioral 'phenotypes' (identified using NIDA's novel phenotyping battery: PhAB) with SUD versus healthy controls (HC).
Methods: The PhAB assesses six neurobehavioral domains using self-completed surveys and behavioral tasks. In the parent study, individuals with SUD (females n=86, males n=122) and healthy controls (HC; females n=64, males n=44) completed the PhAB; exploratory factor analysis (EFA) identified six distinct groups, termed phenotypes (1: working memory, 2: emotionality and impulsivity, 3: negative sensation tolerance, 4: rumination, 5: sleep and attention, 6: executive control). For the current study, we examined if sex acted as an effect modifier on these six phenotypes' associations with SUD versus HC. Logistic regression models were fit with the phenotype's EFA score, sex and a sex-score interaction term.
Results: In the sex-adjusted models, only one of the phenotypes (5: sleep and attention) demonstrated differential associations with SUD versus HC by sex (Factor*Sex Interaction p-value = 0.0025). When models were then stratified by sex, females and males differed not only in the strength but also the direction of the phenotype's association with SUD versus HC (females AOR 0.15, 95% CI 0.06, 0.35; males AOR 1.98, 95% CI 0.87, 4.52).
Conclusions: Our findings demonstrate the vital importance of incorporating sex into the development and validation of SUD phenotyping tools, as sex can modify their utility and accuracy. As the PhAB is translated into a clinical tool to individualize SUD treatments based on underlying neurobehavioral mechanisms, its future iterations should be tailored by sex.

M120. Epidemiology in Time for Action: Harnessing Rapidly Available Mortality Data to Track Emerging Substances and Geographic Patterns in Fatal Overdoses

Chelsea Shover[*1]*
[1]David Geffen School of Medicine at UCLA
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Theoretical/Commentary
Aim: To demonstrate how publicly available mortality data can facilitate rapid identification of regional trends in fatal overdose in the United States.
Methods (Optional): From April-August 2020, my team systematically identified U.S. jurisdictions that provide real-time or near-real-time publicly available mortality data including specific drugs implicated in fatal overdose. We found nine jurisdictions that provide this data; together they account for about 11% of the total U.S. population. Combining these sources enabled us to track fentanyl's westward spread and characterize the epidemiology of deaths involving the novel psychiatric substance isotonitazene both sooner and in finer detail than was possible using national statistics. Records from decedents of both sexes were included. I have maintained these datasets to establish an online research platform so others may use them.
Results (Optional): Data from across these jurisdictions revealed substantially different patterns of co-involved substances. For example, nearly all fatal heroin overdoses from the first half of 2020 in Cook County, IL also involved fentanyl, whereas overdoses involving both heroin and fentanyl were relatively rare in Los Angeles, CA and Maricopa, AZ during this period. In these and other western jurisdictions, fatal overdoses involving fentanyl in combination with methamphetamine or cocaine were much more common. These data also provide early warnings and suggest geographic distribution of emerging substances, such as the designer benzodiazepine flualprazolam with novel synthetic opioids in the Midwestern U.S.
Conclusions: The escalating overdose crisis requires fast data to support fast responses. Collating these existing data sources into a surveillance tool is merely the first step to invest in a robust data system for rapid epidemiology. Characterizing regional differences in overdose mortality in as close to real time as possible can help tailor local educational campaigns, distribute naloxone and other drug-specific preventions, and ultimately save lives.

M121. Acceptability and Feasibility of Act for Latinos With Co-Occurring DUD/HIV in Puerto Rico to Target Self-Stigma as a Treatment Barrier

Coralee Perez-Pedrogo[*1], Sugeily Rivera-Suazo[2], Jesús Ortega-Guzmán[2], Carmen Albizu-García[2]*
[1]University of Puerto Rico, Medical Sciences Campus and Albizu University, [2]University of Puerto Rico, Medical Sciences Campus
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: Engaging people with co-occurring drug use disorders (DUD) and HIV in evidence-based treatment is of high public health significance. ART has improved the survival of PLWHIV, who inject drugs. By 2020, injectable drugs accounted for 41% of accumulated HIV and 46% of accumulated AIDS cases in PR. Self-stigma is a barrier to treatment access and retention for both conditions. Addressing self-stigma may improve treatment outcomes. Evidence supports Acceptance and Commitment Therapy (ACT) efficacy to treat self-stigma for each of these conditions. We present findings on acceptability and feasibility of a six-session ACT intervention in the primary care setting among Latinos with co-occurring DUD/HIV endorsing self-devaluation, an understudied population.
Methods: A pilot randomized two-arm clinical study was conducted in 2019 in primary care to test an ACT-based intervention to reduce internalized stigma among Latinos with DUD/HIV living in PR. A control group received treatment as usual (n=9), and an experimental group received ACT (n=8) for approximately 1 hour, one time per week for six weeks. We present data on acceptability and feasibility of ACT measured after sessions at 1, 3, and 6 weeks. Friedman's Two-Way Analysis of Variances by Ranks tested differences in median scores between measures.
Results: Retention in the ACT group was 87.5%. Mean age 56.13, 50% female, 75% single, and 62.5% did not complete high school. Median ACT acceptability scores were Me_1= 87.5%, Me_2= 85.7% and Me_3= 100% and

feasibility scores (Me_1= 87,5%, Me_2= 85.7% and Me_3= 100%). Both were high since treatment initiation and reached maximum scores by the 6th session.
Conclusions: Initial findings support the intervention's feasibility and acceptability among Latinos with co-occurring DUD/HIV. Findings from this phase 1 pilot will inform further culturally relevant clinical research to test the effectiveness of ACT on self-stigma reduction for this underserved population and its mediating effect on DUD/HIV treatment retention.

M122. "Who Uses the Word 'Craving'? Nobody I've Ever Known"

Destiny Schriefer[*1], Anysia Lee[1], Kirsten Smith[1], Albert Garcia-Romeu[2], Jeffrey Rogers[1], Justin Strickland[2], David Epstein[1]*
[1]National Institute on Drug Abuse, Intramural Research Program, [2]Johns Hopkins University School of Medicine
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Substance Use Disorder
Abstract Category Original Research
Aim: As part of a study developing a just-in-time-adaptive-intervention (JITAI) app for people with SUDs, we interviewed people who might use such an app. One topic examined was craving, a treatment target whose phenomenology and importance are debated among academicians—and whose meaning may vary among the people whose "craving" is academically discussed, if they even use the term.
Methods: Between February 19 and March 13, 2020 (on-site research paused due to pandemic), we conducted semi structured in-depth interviews with 9 adults (3 women, 7 Black, mean age 51.4) residing in Baltimore, Maryland, with active (n=6) or remitted (n=3) opioid and/or stimulant use disorder. Audio was transcribed and thematically analyzed, resulting in a codebook comprising 10 themes and 24 subthemes.
Results: Salient themes identified included: views of craving discordant from those in research literature (including outright rejection of the term); use decisions or "lapses" decoupled from any prior craving; differences in phenomenology of craving by drug class; differences between craving to "get well" versus craving a high; differences in craving during active use versus abstinence; and differences in craving as a function of drug availability. Cue-induced craving was described but differed across participants. Alternative terms suggested by participants included want, need, urge, and itch. Participants had advice for designers of JITAI apps, especially regarding the futility of intervening even slightly too late.
Conclusions: Unlike biomedical interventions that might address craving at some core neural level, JITAIs (which deliver mostly verbal content) must account for the variety of ways in which lapses are driven by—or bypass—a cognitively elaborated set of experiences, which patients may not call craving. The themes we identified in our ongoing formative work have also emerged in prior research, but our work is unique in its direct applicability to the timing and content of app-based interventions.

M123. Total Economic Benefits of Substance Use Disorder Treatment: A Systematic Literature Review of Economic Evaluation Studies from 2003 – 2021

Erminia Fardone[*1], Iván Montoya[1], Kathryn McCollister[1]*
[1]Miller School of Medicine, University of Miami
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Substance Use Disorder
Abstract Category Literature Review
Aim: Economic evaluations of substance use disorder (SUD) treatment and related interventions have increased over the past two decades. Many of these studies have estimated the costs and economic benefits of interventions targeting use and misuse of alcohol, cannabis, opiates, and illicit substances, which are associated with numerous personal and social consequences such as unemployment, crime, emergency department visits, and HIV/HCV transmission. This study assembles and synthesizes the past two decades of economic evaluation evidence describing the benefits and costs of SUD treatment across six main outcome domains: productivity/employment, SUD treatment services, general health services utilization, social services utilization, criminal activity/criminal justice outcomes, and quality of life. Estimates of total economic benefits and economic benefits per outcome

domain are presented from societal (i.e., population-level, including government and any other stakeholder) and healthcare (i.e., payer, provider) perspectives.
Methods (Optional): Authors searched for peer-reviewed literature published after 2003 using numerous databases: PubMed, Cochrane, Embase, EconLit, PsycInfo, Web of Science, Google Scholar. Studies were included if they reported the monetary value of intervention outcomes using cost, cost effectiveness or cost benefit approaches. Estimates of economic benefits were extracted and summarized by intervention type for all included outcome domains. Summary cost estimates were adjusted using the US Consumer Price Index (CPI) to reflect the average 12-month benefits in 2020 US dollars.
Results (Optional): Thirty-three studies met the inclusion criteria. The total benefits and domain-specific benefits varied substantially across studies depending on analytical approaches, time frame, and other methodological factors. Domains representing criminal activity and/or criminal justice costs and health services utilization costs were included in more than half of the studies and were the most significant drivers of total economic benefit.
Conclusions: This study serves as an important resource for policy makers, clinicians, and researchers as they design, implement, and evaluate future interventions for SUD.

M124. "Drugging" PTPRD to Reduce Opiate and Stimulant Reward

George Uhl[*1], Ian Henderson[2], Fanxun Zeng[3], Maria Martinez[2], Che-Lin Hu[2], Fangchao Bi[3], Nazmul Bhiuyan[4], Chamani Perra[5], Dan Luo[4], Tom Prisinzano[4], Wei Wang[3], David Johnson[5]*
[1]University of New Mexico Health Sciences Center, [2]BRINM, [3]University of Arizona, [4]University of Kentucky, [5]University of Kansas

Abstract Detail Animal Study
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Pharmacology
Abstract Category Original Research
Aim: PTPRD is linked to reward from addictive substances including opiates, stimulants and nicotine by human and animal data. To improve understanding of PTPRD and identify therapeutic candidates, we have synthesized and purchased dozens of candidate ligands. modeled PTPRD's phosphatase in silico, used in vitro assays to test > 100 compounds for abilities to alter activities of PTPRD and related phosphatases and tested promising candidates in vivo.
Methods: Recombinant phosphatases from PTPRD and more than 20 other protein tyrosine phosphatases hydrolyzed pNPP, pYGSK3 and pYCKD5 phosphopeptides with spectrophotometric detection of paranitrophenol or molybdenite orthophosphate reaction products. Novel compounds were synthesized. In silico experiments used public crystallographic coordinates for these phosphatases. Toxicity, biodistribution, self-administration and conditioned place preference in vivo studies used wildtype rats and wildtype and PTPRD knockout mice of both genders.
Results: > 60 7-BIA analogs revealed: a) little potency of compounds with substantial structural differences from 7-BIA at most positions d) uM potency of 24 compounds with 7-position substitutions. There was a) little acute toxicity from any of the top three candidates in mouse or rat studies; b) varying oral absorption and brain levels. Screening > 40 flavonoid analogs identified a) positive allosteric modulation (PAM) of PTPRD's hydrolysis of pYGSK3 phosphopeptide by several flavanols, but not by corresponding flavones or anthocyanins b) inhibition of PTPRD's phosphatase by several flavonoids. In silico studies identified a) 7-BIA and 7-BIA analog binding to the PTPRD phosphatase catalytic site b) differential occupancies of two distinct pockets c) positive allosteric modulator site affinities > catalytic site affinities for PAM flavanols.
Conclusions: PTPRD is an attractive site for antiaddiction therapeutics that can reduce reward from opiates, stimulants and other drug classes and for polysubstance abuse. Current results expand our understanding of the PTPRD pharmacology and structure activity relationships and identify candidates to advance toward human clinical trials.

M125. Where Medical Schools and Residency Programs are Lacking in Addictions Education: A Qualitative Study With Health Professions Learners

Jan Klimas[*1], Lauren Gorfinkel[2], Michee Hamilton[3], Mohjevanjeet Lail[4], Dzmitry Krupchanka[5], Walter Cullen[4], Evan Wood[3], Nadia Fairbairn[1]*
[1]University of British Columbia, [2]Columbia University Mailman School of Public Health, [3]British Columbia Centre on Substance Use, [4]University College Dublin, [5]World Health Organization

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Policy
Abstract Category Program Descriptions
Aim: There has been a noticeable deficiency in the implementation of addiction science in healthcare practice and many physicians and healthcare providers feel unprepared to treat addictions following their training. While the inadequate education has been well documented, the perceptions of learners in early-career health professions have not been fully investigated. Therefore, this study sought to explore the perceptions of early-career addiction medicine training among learners in health professions in a Canadian setting.
Methods (Optional): From April 2015 – August 2018, individual semi-structured interviews were conducted with 62 early-career healthcare professionals. This included 47 early-career physicians, social workers and nurses trained in the Canadian Addiction Medicine Fellowships along with 15 medical students who participated in the Flexible Enhanced Learning Curriculum offered by the British Columbia Centre on Substance Use in Vancouver, British Columbia. All interviews were transcribed and underwent content analysis. Transcripts were coded inductively using qualitative data analysis software (NVivo 11.4.3).
Results (Optional): The findings related to early-career training in addiction medicine revealed six key issues: (1) A need for structured addictions training, (2) Insufficient time spent on addiction education, (3) Insufficient clinical training and clinical skill development, (4) Lack of patient-centredness and empathy in training environment, (5) Insufficient implementation of evidence-based medicine, and (6) Prevailing stigmas towards addiction medicine.
Conclusions: Training in addiction medicine among early career professionals appears insufficient, unsupported and lacks a focus on aetiology of addiction and evidence for subsequent care. Educators should include addiction medicine in the early career health professions curricula to improve addictions treatment and attitudes towards patients.

M126. Risk-Taking, Delayed Discounting, and Probabilistic Discounting Among Cannabis Users, Illicit Drug Users With Co-Occurring Cannabis Use, and Controls

Kechna Cadet[1], Alina Shevorykin[2], Thomas Chao[3], Alexandria Bauer[4], Gabriella Robinson[5], Lovelyne Julien[6], Lesia M. Ruglass[7]*
[1]Johns Hopkins Bloomberg School of Public Health, [2]Pace University, [3]New York State Psychiatric Institute, [4]Rutgers University, [5]City University of New York, [6]The New School, [7]The City College of New York, CUNY
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavioral Economics
Abstract Category Original Research
Aim: Although poor decision making and impulsivity are core tenets of substance use disorder, few studies have examined decision making and impulsivity differences in non-dependent cannabis and concurrent cannabis users. We investigated impulsivity and decision-making among adult cannabis-only users, concurrent users of cannabis and other illicit drugs, and healthy controls.
Methods: A cross-sectional survey was conducted on Amazon MTurk (N = 149). Twenty-nine participants were cannabis-only users (Mage=33.79, SD=6.34), 93 were concurrent users (Mage=31.90, SD=5.71), and 27 were healthy controls (Mage=31.74, SD=5.01). Multivariate Analysis of Variance (MANOVA) was used to assess for group differences in self-reported impulsivity (as measured by Barratt Impulsiveness Scale [BIS]), and subjective values were calculated using area under the curve (AUC) for performance on a Delay Discounting Task (DDT; a measure of decision making). Repeated measures mixed model ANOVA was also used to assess group differences in performance on the Iowa Gambling Task (IGT; a measure of decision making).
Results: Although there were no group differences in self-reported impulsivity, the concurrent cannabis group discounted more steeply than the control group and cannabis-only group on the DDT ($F=3.442$, $p=.036$, $\eta 2=.063$) but did not significantly differ across probabilistic discounting ($F=1.820$, $p=.167$, $\eta 2=.034$). Similarly, repeated-measures mixed model ANOVA revealed a significant interaction between block and group on IGT measure ($F=2.556$, $p=.011$, $\eta 2=.092$), such that the net score of the gambling task significantly differed between cannabis-only, concurrent cannabis, and controls depending on the block, suggesting that concurrent users and cannabis users are slower to improve in their performance on the IGT than controls. However, main effect of groups was not statistically significant different.

Conclusions: Individuals who use cannabis concurrently with other illicit substances appear to exhibit greater impulsivity and poorer decision making, which suggest that delay discounting may be an important potential target for intervention regarding users of multiple substances.

M127. Getting the Good, the Bad and the Ugly on the Way Into the Hinterland: Substance Abuse and Willingness to Experiment With Illicit Substances Among Long-Distance Drivers in Lagos, Nigeria

Olanrewaju Onigbogi[*1], Omobola Ojo[2]*
[1]College of Medicine, University of Lagos, [2]Federal Medical Center Abeokuta
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: Rest areas on major truck routes sometimes provide opportunities for drug experimentation and use of illicit substances. This study sought to determine the willingness to use illicit substances by long-distance drivers in rest stops along the major truck route from the southern to northern Nigeria.
Methods: We recruited male long-distance truck drivers in Lagos, Nigeria using a modified version of time-location sampling technique in a three-stage sampling design. We used a three-stage sampling design with truck destination groups as the primary sampling unit (PSU). We conducted a census at 2pm and used as our half-days which was then used as secondary sampling units (SSUs) and individual drivers as our tertiary sampling units (TSUs).SPSS version 14 data editor was used to analyze data while univariate Odds Ratios (OR) and 95% Confidence Intervals (CI) were used to evaluate the correlates of willingness to participate (WTP).
Results: A total of 45 drivers (29.6%) said they had previously used and would be willing to try new illicit substances if offered in the rest areas along the southern to northern Nigeria route. Higher willingness was associated with longer driving experience (OR = 1.43, 95% CI: 1.22–1.79) and higher levels of education (OR = 1.45, 95% CI: 1.24–1.75). Decreased willingness was associated with increased age (OR = 0.52, 95% CI: 0.41–0.84), present marriage (OR = 0.52, 95% CI: 0.43–0.63) and knowledge of multiple local languages (OR = 0.51, 95% CI: 0.32–0.73).
Conclusions: Factors associated with the willingness to use illicit substances should be considered in planning interventions that would address substance abuse among long-distance drivers in Nigerian major cities.

M128. Impact of COVID-19 Pandemic in Addiction Treatment Resources

Marta Torrens[*1], Claudio Castillo[2], Fernando Dinamarca[2], Clara Caldentey[2], Noemí Gonzalez[2], María Robles[2], Ana María Coratu[2], Francina Fonseca[1]*
[1]Universitat Autonoma de Barcelona, [2]Parc de Salut Mar, Barcelona, Spain
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: The coronavirus infection 2019 (COVID-19), could affect severely people with substance use disorders (SUDs) and supposed a challenge for most Addiction Services to continue offering treatment to patients. The aim is to present the adaptations in different facilities involved in treatment of SUD during COVID-19 pandemic and to describe changes in patients assessed during the strict lockdown period (March to May 2020) in Sant Adrià del Besòs (Barcelona, Spain).
Methods: In March 2020, harm reduction services and outpatient addiction centers had to adapt to avoid the spread of the infection and to address continued access to the services including the low-threshold services. The main changes were: a)implementation of telemedicine and to reduce face-to-face visits to new admissions on treatment and urgent demands; b)to rehearse the continuity of pharmacological treatment by increasing the take-home deliver of opioid maintenance treatments and other medications; c)cancelation of group-based therapies; d) to apply a protocol for early detection of COVID-19 infected cases.
We have obtained data on number of patients assessed and main sociodemographical and clinical data for 3 months (March-May 2020), and we compared them with the same period in 2019.
Results: The measures were implemented in the harm reduction center and in the outpatient center. We observed a decrease in harm reduction service use (53%), whereas the number of overdoses treated in the service were stable.

The number of patients seeking treatment in outpatient addiction center, slightly increased; mainly men (76% in 2019 vs. 94% in 2020) and the main drug was heroin (58%) and alcohol (23%).
Conclusions: The necessary adaptations to Addiction Services provision provide opportunities for the analysis of current processes used and the introduction of new processes.

M129. The Early Impact of COVID-19 on Drug Use Behaviors

Nina Christie[*1], Vanya Vojvodic[1], John Monterosso[1]*
[1]University of Southern California
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavior
Abstract Category Original Research
Aim: Social distancing policies have been widely adopted in response to the COVID-19 pandemic. Social connections are positively associated with beneficial health outcomes, while social isolation is associated with poor long-term health outcomes including reduced life expectancy (McPherson et al., 2006; Yang et al., 2016). The present study evaluates the impact of social distancing during the early period of COVID-19 on substance use behaviors among those in the United States.
Methods: We used an internet-based survey with participants (n = 157; 86 male) reporting a history of problems related to drug use. We relied on ANOVA and logistic regression techniques to assess the associations between substance use and isolation characteristics.
Results: Those with more severe drug use problems reported feeling more socially isolated during social distancing. Those who primarily use opioids reported feeling more isolated than those who primarily use alcohol. During social distancing, participants reported an increase in alcohol and cigarette consumption, and a decrease in cocaine use. Participants who primarily used alcohol had a greater increase in feelings of social isolation relative to opioid users (whose mean was already lower pre-social distancing). Lastly, those who report using drugs for social reasons were less likely to have decreased substance use during social distancing.
Conclusions: The current study establishes that drug use and feelings of connection have been impacted by the pandemic. Further, there are differential impacts based on drug of choice. These results further the line of research on the connection between sociality and drug use.

M130. Collegiate Recovery Programming in the United States: Findings From a Recent Prisma Scoping Review

Noel Vest[*1], Meg Reinstra[2], Christine Timko[2], John Kelly[3], Keith Humphreys[2]*
[1]Stanford University School of Medicine, [2]Stanford University, [3]Massachusetts General Hospital
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Health Services
Abstract Category Literature Review
Aim: Substance use is a critical public health problem among university students in many countries, including the United States where roughly 600,000 US college students report being in recovery from a substance use disorder (SUD). To support students seeking to maintain or initiate SUD recovery, at least 138 U.S. higher education institutions have established collegiate recovery programs (CRPs). We conducted a scoping review to provide a summary of existing studies on college students in SUD recovery and to identify research gaps and inform policy.
Methods (Optional): A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) search was conducted to identify research studies related to college programming for students in recovery from SUD published before August 2020. Characteristics such as primary outcome, research design, sample size, and funding source were extracted and summarized to provide an overview of the existing literature.
Results (Optional): The search identified 357 abstracts, of which 244 were excluded. A full-text review of 113 articles was conducted and resulted in 59 exclusions. All but one study were observational or qualitative study designs. Most examined the qualitative lived experiences of students in recovery and clinical outcomes, while a smaller portion focused on program characteristics and non-clinical outcomes. Most were non-government-funded investigations.
Conclusions: This scoping review revealed important information regarding individual, social, and programmatic outcomes relating to CRPs. Additionally, the review exposed a severe lack of research on underserved student

groups and highlights the need to know more about CRP students of color, women students, and low-income and first-generation students. The domains identified offer a framework for healthcare providers, college administrators, and researchers; and will help to inform policy and practice to improve outcomes for this marginalized student group.

M131. Sex Differences in Mental Health Symptoms and Associations With Substance Use During the Transition to Young Adulthood

Patrick Loftus[*1], Evan Krueger[1], Junhan Cho[1], Jennifer Unger[1], Jessica Barrington-Trimis[1], Jessica Braymiller[1]*
[1]University of Southern California

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Disparities
Abstract Category Original Research

Aim: To identify common profiles of positive and negative mental health symptoms during late adolescence, and to estimate longitudinal associations with young adult substance use by sex.
Methods: Data were from a prospective longitudinal cohort of diverse youth originally recruited from 10 Southern California high schools in 2013. Surveys completed during late adolescence (baseline, mean age = 17) and young adulthood (follow-up, mean age = 19) were used for the present analyses (N=1,144). Latent class analysis was used to determine baseline patterns of two positive (happiness and meaning in life) and four negative dimensions of mental health (Major Depressive Disorder, Generalized Anxiety Disorder, Panic Disorder, and Social Phobia) among non-substance using young men and women. Latent class membership was then used as a predictor of past six-month cigarette, e-cigarette, cannabis, alcohol, and illicit drug use at follow-up.
Results: Four patterns of mental health symptoms were identified: High Negative/Low Positive (i.e., high prevalence of negative symptomatology plus low prevalence of positive symptomatology; 10.0%), Low Negative/Low Positive (41.0%), Low Negative/High Positive (44.4%), and High Negative/High Positive (4.7%). Significant differences in class membership by sex indicated that women were more likely to be Low Negative/Low Positive, and less likely to be High Negative/High Positive. Low Negative/High Positive and High Negative/High Positive women were less likely to report past six-month cannabis use. High Negative/Low Positive and Low Negative/Low Positive women were especially at risk for past six-month cigarette use.
Conclusions: Some adolescents experience mixed negative and positive mental health symptoms, and prevalence may differ by sex. Higher subjective happiness and meaning in life scores may be protective against latter cannabis and cigarette use in adolescent females.

M132. Transitions in Prescription Benzodiazepine Use, Misuse and Substance Use Disorder Symptoms Through Age 50

Sean McCabe[*1], John Schulenberg[1], Timothy Wilens[2], Christian Teter[3], Ty Schepis[4], Vita McCabe[1], Philip Veliz[1]*
[1]University of Michigan, [2]Massachusetts General Hospital, [3]McLean Hospital, [4]Texas State University

Abstract Detail Human
Select Drug Category Sedative/Hypnotics
Topic Epidemiology
Abstract Category Original Research

Aim: To examine prescription benzodiazepine use and misuse and longitudinal transitions to prescription benzodiazepine misuse, prescription opioid misuse, and substance use disorder (SUD) symptoms during middle adulthood (ages 35-50).
Methods: Data were from 11 cohorts of nationally representative US high school seniors (N=26,575) followed longitudinally via self-administered surveys from age 18 (1976-1986) to age 50 (2008-2018) in the Monitoring the Future study. We created the following subgroups based on lifetime prescription benzodiazepine histories by age 35: population controls who reported no use or misuse (70.9%); only medical use (11.1%); only misuse (10.4%); and both medical use and misuse (7.5%). We compared these subgroups for certain outcomes in middle adulthood between ages 35-50: prescription benzodiazepine misuse, prescription opioid misuse, and SUD symptoms.
Results: Among those reporting only medical use by age 35, approximately 12.1% reported prescription benzodiazepine misuse from ages 35-50 while an estimated 39.3% developed SUD symptoms. Multivariable logistic regression analyses indicated that respondents who reported only medical use of prescription benzodiazepines by age 35 had higher odds of prescription benzodiazepine misuse (AOR=2.54, 95% CI=2.01-

3.21), prescription opioid misuse (AOR=1.60, 95% CI=1.24-2.06), and two or more SUD symptoms (AOR=1.19, 95% CI=1.04-1.35) between ages 35-50 when compared to population controls with no history of prescription benzodiazepine use or misuse. Respondents who had any history of prescription benzodiazepine misuse by age 35 had significantly higher odds of prescription benzodiazepine misuse, prescription opioid misuse, and two or more SUD symptoms from ages 35-50 when compared to population controls or those reporting only medical use of prescription benzodiazepines.
Conclusions: Prescription benzodiazepine use by age 35 may be a signal for substance-related problems during middle adulthood. Increased prescription benzodiazepine misuse during middle adulthood warrants enhanced screening and monitoring given the morbidity associated with misuse of these controlled medications.

M133. Correlates of Past Suicide Attempt History in a Sample of Pregnant Women With Substance Use Disorders

Lillia Thumma[*1], Divya Sharma[1], Anna Wiese[1], Michelle Eglovitch[1], Anna Beth Parlier-Ahmad[1], Nancy Haug[2], Dace Svikis[1]*
[1]Virginia Commonwealth University, [2]Palo Alto University
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: Suicide is the 10th leading cause of death for adults in the USA and has increased by >60% from 1994 to 2017 The present study examined psychosocial and personality factors associated with attempted suicide in a treatment sample of pregnant women diagnosed with Substance Use Disorders (SUD).
Methods: This secondary analysis examined baseline data from 170 pregnant women in residential SUD treatment and participating in behavioral intervention RCTs. All provided informed consent and were compensated for participation. Study measures included the Addiction Severity Index (ASI) and Minnesota Multiphasic Personality Inventory (MMPI-2). Comparisons of women with (n=28) and without (n=142) a history of attempted suicide were made using chi-square for categorical and t-tests for continuous variables.
Results: Female participants were predominantly Black (79.4%) with a mean age of 29.1 (SD=4.6) years. Women with a suicide attempt history (SAH) were more likely than women without such history (NSAH) to report serious depression and anxiety (recent and lifetime; all p<.001); physical abuse (recent p<.05; lifetime p<.006) and sexual abuse (lifetime p<.009). For ASI composite scores, the groups differed on Family/Social and Psychiatric domains, with higher scores for the SAH vs NSAH women (p<.026 and .001). SAH women also had higher levels of psychopathology than NSAH women, with higher MMPI-2 T-scores on 7 of the 10 primary scales [1 (Hysteria); 2 (Depression); 3 (Hypochondriasis); 4 (Psychopathic Deviance); 6 (Paranoia); 7 (Anxiety); and 8 (Schizophrenia)].
Conclusions: Pregnant women with a history of suicide attempts presented for SUD treatment with higher family/social and psychological problems and greater psychopathology than those without such history. Study findings suggest that pregnant women with SUD who have a history of suicidality may require more intensive psychological interventions to address trauma and other comorbid conditions. This research supports screening and assessment procedures to inform suicide prevention among this high-risk population.

M134. Intraindividual Variability in Sleep May Be a Key Component in Substance Use Treatment Outcomes

Allison Wilkerson[*1], Danica Slavish[2], Jessica Dietch[3], Richard Simmons[1], Daniel Taylor[4], Joshua Smith[1], Sarah Book[1], Aimee McRae-Clark[1]*
[1]Medical University of South Carolina, [2]University of North Texas, [3]Stanford University School of Medicine, [4]University of Arizona
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: Poor sleep is common in early abstinence among individuals with substance use disorders (SUDs), though attempts to link important sleep parameters (e.g., total sleep time [TST], sleep efficiency [SE]) to treatment outcomes have had limited success. One explanation for mixed findings in the extant literature may be the disproportionate focus on mean values of sleep parameters across multiple nights, rather than considering night-to-

night differences (i.e., intraindividual variability). The current study assessed sleep across one week in SUD treatment-seeking adults, with the aim of prospectively examining the relationship between TST and SE intraindividual variability with two important treatment outcomes: 1) treatment completion and 2) relapse within 1 month.
Methods: Twenty-three adults beginning a SUD intensive outpatient program were asked to wear an actigraph for one week at the beginning of treatment. Logistic regression was run with intranindividual means and standard deviations for actigraphy-derived TST and SE as the independent variables and treatment completion (yes/no) and 1-month relapse (yes/no) as the dependent variables.
Results: Greater night-to-night variability in actigraphy TST was associated with decreased odds of completing treatment (OR = 0.33, 95% CI [0.09 – 0.80], p = 0.045), and increased odds of relapse at 1-month post-treatment (OR = 3.62, 95% CI [1.37 – 13.92], p = 0.028). SE variability was not associated with odds of treatment completion or relapse. Mean TST and SE were not associated with odds of treatment completion or relapse.
Conclusions: This study indicates night-to-night variability in actigraphy TST is a better predictor of SUD treatment outcomes than average sleep patterns across the week. These results may have important implications about the value of promoting consistent sleep as a modifiable risk factor for negative treatment outcomes. Future research should repeat this in larger samples to examine potential moderators including SUD type, treatment setting characteristics, and sleep environment factors.

M135. Prevalence and Correlates of Co-Occurring Opioid and Sedative Use Among Retired National Football League Athletes

Zachary Mannes[1], Deborah Hasin[2], Linda Cottler[3]*
[1]Columbia University, Mailman School of Public Health, [2]Columbia University, [3]University of Florida
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: National Football League (NFL) retirees experience higher rates of opioid use than general medical patients. When taken with sedatives, use can lead to a multitude of negative health consequences, including overdose, compared to opioid use alone. The aim of this study was to examine the prevalence and correlates of co-occurring opioid and sedative use among NFL retirees.
Methods: Former NFL athletes from the Retired NFL Players Association (N=644) were recruited in 2010 and answered questions pertaining to socidemographic characteristics (age, education, race), NFL career (position, years played, total concussions, career-ending injury [no, yes]), pain (0=no pain- 10=pain as bad as you can imagine), health (mental health impairment [none/mild vs moderate/severe],disability status [no, yes]), and any past-30 day substance use, including heavy alcohol use (>14 drinks per week), opioids, and sedatives. A multinomial logistic regression model that included sociodemographic, NFL, pain, health, and alcohol variables assessed the correlates associated with the four-level outcome (no use, opioids only, sedatives only, opioids and sedatives) with no use serving as the reference group.
Results: Approximately 11.6%, 3.4%, and 5.0% of NFL retirees reported past 30-day use of opioids only, sedatives only, and co-occurring use of opioids and sedatives, respectively. Greater pain was associated with opioid use only (aOR= 1.31, 95% CI= 1.15, 1.49), and co-occurring use of opioids and sedatives (aOR= 1.70, 95% CI= 1.36, 2.13). No associations were observed between health indicators and opioid or sedative use individually. However, retirees with moderate/severe mental health impairment (aOR=1.70, 95% CI=1.36, 2.13) and disability (aOR=1.29, 95% CI=1.02, 1.63) demonstrated greater odds of co-occurring use of opioids and sedatives.
Conclusions: Of NFL retirees using opioids, nearly one-third reported use in conjunction with sedatives. Assessment and requisite treatment of physical and mental health impairment may reduce concurrent use of these substances, and consequently yield improved health outcomes for former NFL athletes.

Virtual Poster Q&A Session I: Stimulants

M136. High Phenotypic Motor Impulsivity is an Antecedent to Cocaine-Seeking Behavior in Male Rats

Ashley Smith[*1], Veronica Campbell[1], Holly Chapman[1], Sonja Stutz[1], Robert Fox[1], F. Gerard Moeller[2], Kathryn Cunningham[1], Noelle Anastasio[1]*
[1]University of Texas Medical Branch, [2]Virginia Commonwealth University
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Relapse is a dynamic, essential barrier to recovery in substance use disorders. Relapse is often precipitated by exposure to drug-associated cues and has been tied to impulsive behavior, particularly in cocaine use disorder. Motor impulsivity is characterized by impulsive action or the inability to withhold a premature response. Here, we tested the hypothesis that phenotypic levels of motor impulsivity may predict drug-seeking behavior during abstinence from cocaine.
Methods: Naïve male Sprague-Dawley rats (n=48) were trained to stability on the 1-choice serial time reaction (1-CSRT) task and phenotyped as high impulsive (HI) or low impulsive (LI). Rats were then trained to self-administer (SA) cocaine (0.75 mg/kg/inf) until stability on a fixed ratio 5 schedule of reinforcement, followed by reinitiation of stable 1-CSRT performance. On the day corresponding to 30 days of abstinence from cocaine SA, rats underwent a drug-seeking test session in which lever presses were reinforced with the discrete cue complex previously paired with drug infusion.
Results: Acquisition of cocaine SA and the cumulative levels of cocaine intake observed did not differ in HI vs. LI rats. Rats identified as HI or LI retained their original motor impulsivity phenotype during 30-days of abstinence from cocaine SA, with HI rats exhibiting increased lever presses for cocaine-associated cues relative to LI rats.
Conclusions: These data suggest that antecedent levels of motor impulsivity are not a major driver of cocaine intake under the present conditions, but motor impulsivity is predictor of cocaine-seeking during extended abstinence. Importantly, these results demonstrate the efficacy of the motor impulsivity endophenotype in predicting relapse-like behaviors. Identification of motor impulsivity may provide more accurate and tailored diagnoses and/or treatments for patients, which could improve treatment outcomes, especially prevention of relapse.

M137. Discriminative Stimulus Effects of Six Novel Cathinone Analogs

Andrew Tourigny[*1], Michael Gatch[1]*
[1]University of North Texas Health Science Center
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Stimulants have posed a unique public health problem for decades. New analogs surface on the streets as substitutes for methamphetamine use, hindering law enforcement efforts and often producing serious adverse effects in illicit stimulant users. The locomotor stimulant and stimulant-like interoceptive effects of 6 novel compounds were tested.
Methods: A locomotor activity time course/dose response study of 4Cl-PVP, 4-MEAP, 4F-PHP, eutylone, N-butylpentylone, N-ethylhexylone, and PV8-induced locomotor stimulation was conducted using male Swiss-Webster mice. The discriminative stimulus effects of methamphetamine and the cathinone analogs were tested in male Sprague-Dawley rats trained to discriminate between methamphetamine and saline.
Results: Each of the cathinones produced dose-dependent increases in locomotor activity with rank order of potency: 4-MEAP > 4Cl-PVP = eutylone = N-ethylhexylone = PV8 = 4F-PHP > N-butylpentylone > BMDP. N-butylpentylone and BMDP produced weak stimulant effects with maximal effects 59% and 56% of the methamphetamine peak, respectively. BMDP produced a maximum of 33% methamphetamine-like responding. The remaining compounds fully substituted with rank order of potency methamphetamine > 4Cl-PVP = N-ethylhexylone = PV8 = eutylone = 4-MEAP > 4F-PHP > N-butylpentylone.
Conclusions: BMDP partially substituted for the discriminative stimulus effects of methamphetamine, whereas all other cathinone analogs produced full methamphetamine-like interoceptive effects and have the potential to be used as a substitute for methamphetamine. Due to the shared mechanisms of action of these compounds to

common psychostimulants, humans are likely to experience similar subjective effects to methamphetamine and could be abused in the same way.

M138. Effects of Almorexant, a Dual Orexin Receptor Antagonist, on the Sleep-Disrupting and Daytime Stimulant Effects of Methamphetamine in Male Rhesus Monkeys

Lais Berro[*1], Eliseu Moreira-Junior[1], James Rowlett[1]*
[1]*University of Mississippi Medical Center*

Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Emerging evidence indicates that methamphetamine significantly disrupts sleep, even when administered up to ~8h prior to the sleep phase. The aim of the present study was to investigate the effects of the dual orexin receptor antagonist (DORA) almorexant on the sleep-disrupting and daytime stimulant effects of methamphetamine in adult rhesus monkeys. Given the important role of orexin systems in sleep-wake regulation, we hypothesized that almorexant would improve actigraphy-based sleep parameters in animals treated with methamphetamine.
Methods: Subjects were fitted with primate collars to which actigraphy monitors were attached and were given acute injections of vehicle or methamphetamine (0.03, 0.1 or 0.3 mg/kg, i.m.) in the morning (9h) (n=4 males). Vehicle or almorexant (1, 3 or 10 mg/kg, i.m.) were then administered in the evening (16:30h, 1.5h before "lights off") following morning (9h) administration of methamphetamine (0.3 mg/kg, i.m.), or as a pretreatment (8:30h) before methamphetamine injections (9h).
Results: Morning methamphetamine administration dose-dependently impaired sleep in rhesus monkeys, with 0.3 mg/kg significantly increasing sleep latency ($p<0.01$) and decreased sleep efficiency ($p<0.001$). Administration of almorexant, both as a pretreatment or as an evening treatment, improved methamphetamine-induced sleep impairment in a dose dependent manner, with the dose of 10 mg/kg significantly reducing sleep latency ($p<0.05$) and increasing sleep efficiency ($p<0.05$) compared to vehicle. Morning pretreatment with almorexant also blocked the daytime stimulant effects of methamphetamine ($p<0.05$).
Conclusions: Our findings indicate that orexin mechanisms are involved in both methamphetamine-induced sleep disruption and hyperarousal.

M139. "That Line Just Kept Moving": Motivations of People who Use Methamphetamine and Their Experiences in the Emergency Department

Callan Fockele[*1], Sophie Morse[1], Ly Huynh[1], Alina Zatzick[1], Lauren Whiteside[1]*
[1]*University of Washington at Harborview Medical Center*

Abstract Detail Human
Select Drug Category Stimulants
Topic Health Services
Abstract Category Original Research

Aim: Methamphetamine (meth) use is on the rise with increasing emergency department (ED) visits related to overdose. Previous research notes people who use meth have high rates of health care utilization and recidivism, but little is known about the perspectives of patients who use the ED for care. The aim of this study is to identify the motivations of people who use meth and their experiences in the ED to guide future ED-based approaches.
Methods: A qualitative study of adults residing in Washington state, who endorsed high-risk meth use in the last 30 days, recently visited the ED, and had access to a phone, was performed from April to September 2020. Twenty individuals completed semi-structured interviews, which were recorded and transcribed prior to being coded. Grounded Theory guided the analysis; therefore, the interview guide and codebook were iteratively refined. Two investigators coded independently until consensus, and data were collected until thematic saturation.
Results: Participants described a shifting line that separates the positive attributes from the negative consequences of using meth. Many used meth initially to enhance social situations, combat boredom by chasing the high, and escape difficult circumstances by numbing the senses. However, continued use often led to isolation, ED visits for the sequelae of "overamping," and participation in risky behaviors. Because of their previous frustrating experiences, interviewees anticipated difficult interactions with healthcare providers, leading to avoidance of the

ED and downstream medical complications. Participants desired linkage to outpatient resources and treatment without stigma.
Conclusions: Meth use drives patients to EDs, where they often feel stigmatized and perceive they are provided little assistance. ED providers should acknowledge addiction as a chronic disease, address symptoms adequately, and provide positive connections to outpatient resources. Future work should incorporate patient perspectives into ED-based programs.

M140. Cocaine Dependence Among Coca Leaf Chewers of the Coast, Mountains, and Jungle of Peru

Victor Cruz[1], David Barondess[2], Javier Saavedra[1], James Anthony[2]*
[1]National Institute of Mental Health "Honorio Delgado - Hideyo Noguchi," Peru, [2]Michigan State University
Abstract Detail Human
Select Drug Category Stimulants
Topic Epidemiology
Abstract Category Original Research
Aim: The aim was to estimate the occurrence of coca dependence among the rural inhabitants of the coast, mountains, and jungle of Peru and the pooled estimate of it.
Methods: Data were obtained from mental health surveys conducted in the coast, mountains, and jungle of Peru in 2007 (n=2,536 adults age 18+ years), 2008 (n=3,031 adults age 18+ years), and 2009 (n=2,331 adults age 18+ years) respectively. Standardized assessments covered coca leaf chewing and dependence (via Mini-International Neuropsychiatric Interview [MINI]), age, education, ethnicity, and EPV levels. The statistical approach dealt with complex survey design features and meta-analysis of proportions.
Results: 0.2 percent of the ever coca leaf chewers of the rural coast of Peru qualified as cocaine-dependent cases (95% CI=0.04–0.90), and 0.8 percent of the ever coca leaf chewers of the rural jungle of Peru qualified as cocaine-dependent cases (95% CI=0.16–3.65). In comparison, 2.3 percent of the ever coca leaf chewers of Peru's rural mountains qualified as cocaine-dependent cases (95% CI=1.40–3.50). The pooled estimate of the occurrence of cocaine dependence among the rural population of Peru was 1.2 percent (95% CI= -0.12–2.45).
Conclusions: The cocaine dependence syndrome among ever coca leaf chewer is a rare but consistent phenomenon that deserves attention in future public health research in Peru.

M141. Locomotor and Discriminative Stimulus Effects of the Benzofuran Compounds 5-APDB and 6-APB

Rebecca Hill[1], Ritu Shetty[1], Nathalie Sumien[1], Michael Forster[2], Michael Gatch[1]*
[1]University of North Texas Health Science Center, [2]University of Texas Health Science Center
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Benzofurans are used recreationally, due their ability to cause psychostimulant and/or entactogenic effects, and have been the source of many reported adverse effects, including death. Two benzofurans 5-(2-aminopropyl)-2,3-dihydrobenzofuran (5-APDB) and 6-(2-aminopropyl) benzofuran (6-APB) were tested in vivo to determine the motor stimulant and discriminative stimulus efficacy and potency in comparison with methamphetamine and 2,3-methylenedioxymethamphetamine (MDMA).
Methods: Locomotor activity was tested in male Swiss-Webster mice to screen for locomotor stimulant or depressant effects and to identify behaviorally active dose ranges along with times of peak effect. Discriminative stimulus effects of 5-APDB and 6-APB were tested in male Sprague-Dawley rats trained to discriminate MDMA (1.5 mg/kg) from saline.
Results: In the locomotor activity test, 5-APDB (ED50=3.7 mg/kg) produced a weak stimulant effect 50 to 80 minutes after injection. A depressant effect (ED50=9.4 mg/kg) was observed 0 to 30 minutes following injection. 6-APB (ED50=2.3 mg/kg) produced a maximal stimulant effect 20 to 50 minutes after injection. MDMA (ED50=9.9 mg/kg) produced a maximal stimulant effect 50 to 100 minutes following injection. (+)-Methamphetamine (ED50=0.59 mg/kg) produced a maximal effect between 20 to 50 minutes following injection. In the drug discrimination tests, 5-APDB (ED50=1.02 mg/kg) and 6-APB (ED50=0.32 mg/kg) both fully substituted in MDMA-trained rats, 6-APB decreased response rate.

Conclusions: The synthetic benzofuran compound 5-APDB had locomotor effects similar to MDMA, whereas 6-APB, produced locomotor stimulant effects similar to those of methamphetamine. Potencies of the benzofurans were between those of MDMA and methamphetamine. Both compounds fully substituted in MDMA trained rats suggesting a similar subjective effect. These results suggest that these compounds could be used recreationally as substitutes for MDMA.

M142. Open Board

M143. Signaled and Unsignaled Foot Shock Punishment in Rats Self-Administering MDPV

Michelle Doyle[*1], Karen Jimenez[1], Kenner Rice[2], Gregory Collins[1]*
[1]University of Texas Health Science Center at San Antonio, [2]National Institute of Drug Abuse, National Institutes of Health

Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: A subset of rats that self-administer synthetic cathinones, such as 3,4-methylenedioxypyrovalerone (MDPV), develop high levels of drug intake and patterns of responding similar to the compulsive, binge-like patterns of cathinone (e.g., "bath salts") use reported in humans. A prior study suggested "high-responder" rats may be less sensitive to unsignaled punishment of responding by footshock than "low-responder" rats; however, it is unclear if signaled punishment would produce similar effects. These studies evaluated whether (1) high-responder rats were less sensitive to footshock-punished responding than low-responder rats using both unsignaled and signaled footshock procedures; (2) high-responder rats learned the signaled footshock procedure (earning >70% of baseline infusions and avoiding >70% of footshocks) more slowly than low-responder rats.

Methods: Inhibition curves for unsignaled footshock (0.05-0.9mA, increasing across sessions) were evaluated in twelve adult male Sprague Dawley rats self-administering 0.032 mg/kg/infusion MDPV under a FR5 schedule of reinforcement; footshocks were delivered with ~50% of drug infusions. Rats were then trained on a signaled footshock procedure, in which a change in stimulus conditions signaled that the next infusion would be paired with a footshock (intensities individualized to each rat's IC50). Rats could avoid a footshock by withholding responding for 30-sec. After rats learned the signaled shock procedure, inhibition curves were generated using the signaled footshock procedure.

Results: High- and low-responder rats were similarly sensitive to unsignaled punishment by footshock (mean IC50s- high-responders: 0.30mA; low-responders: 0.33mA). However, high-responder rats (mean: 154mA) received significantly more total current than low-responder rats (mean: 30mA). Low-responder rats learned the signaled footshock procedure more rapidly than high-responder rats.

Conclusions: High-responder rats appear to be equally sensitive to the effects of footshock, but less able to adapt their behavior in response to footshock. These studies provide insight into aspects of the high-responder's compulsive drug-taking despite adverse consequence, a core DSM symptom of substance use disorders.

M144. Training Priorities for Substance Use Professionals Treating Clients With Sex/Drug-Linked Behavior

J. Michael Wilkerson[*1], Elizabeth Obekpa[1], Jialing Zhu[1], Doug Braun-Harvey[2], David Latini[3]*
[1]The University of Texas Health Science Center at Houston, [2]The Harvey Institute, [3]The Montrose Center

Abstract Detail Human
Select Drug Category Stimulants
Topic Health Services
Abstract Category Original Research

Aim: Sex/drug-linked behavior occurs when drug/alcohol-dependent behavior merges with sexual behavior. Clinical and prevention staff may find it difficult to provide equitable care to clients presenting with this behavior due to a lack of training or inability to suspend judgement. Using data from one sexual and gender minority-serving mental health and intensive outpatient substance use treatment clinic as a case study, the purpose of this analysis was to identify training opportunities that could improve clinical outcomes for clients with sex/drug-linked behavior.

Methods: As part of a larger evaluation study of an intensive outpatient program and wrap around services, employees of an SGM-serving counseling center (N=69) completed a survey in March 2020 that asked about previous sexual health training, competency serving persons with identities different than their own, and comfort and willingness to discuss various sex/drug-linked behaviors with clients and colleagues. The resulting descriptive and bivariate data were combined with 12 months of observation field notes by the first author to inform training recommendations.
Results: Nearly a quarter (23.1%) of staff lacked formal training in sexual health and nearly half (40.0%) lacked experience serving clients with sex/drug-linked behavior. When asked to discuss sexual health topics beyond those usually associated with HIV prevention, such as condom use and Art/PrEP adherence, over half of the staff indicated relatively high discomfort. Areas for additional training include how to do a case presentation/consult for a client with sex/drug-linked behavior; how to suspend judgement and minimize differences between the provider and client; how to discuss experiences with sexual violence, both as perpetrator and victim; and how to discuss participating in fetishized sexual practices and finding sexual pleasure while not under the influence of substances.
Conclusions: Substance use professionals would benefit from training that provides the skills to better support clients with sex/drug-linked behavior.

M145. Experiences and COVID-19 Concerns Among People Who Use Methamphetamine and Had a Recent Emergency Department Visit: A Qualitative Study to Inform Future ED-Based Risk Reduction Strategies

Lauren Whiteside[*1], Sophie Morse[1], Ly Huynh[1], Alina Zatzick[1], Callan Fockele[1]*
[1]*University of Washington*
Abstract Detail Human
Select Drug Category Stimulants
Topic Health Services
Abstract Category Original Research
Aim: The Washington state 'Stay Home, Stay Healthy' order issued in March 2020 encouraged social distancing and closed business to prevent transmission of COVID-19. The aim of this study was to explore concerns and COVID-19 risk mitigation strategies with patients who use meth to inform emergency department (ED)-approaches for this vulnerable population.
Methods: A mixed-methods study of adults residing in Washington with high-risk meth use, a recent ED visit, and access to a phone was performed from April-September 2020. First, participants completed a survey on substance use, and perceptions of COVID-19 by phone or internet. Descriptive statistics were used to report survey responses. Next, participants completed a semi-structured interview exploring perceptions of COVID-19 and recent experiences related to meth using an interview guide. Interviews were recorded and transcribed. Analysis of the transcript was guided by Grounded Theory to refine the guide and codebook. Interviews were independently coded by 2 investigators; codes were discussed until consensus and data collection continued until saturation.
Results: 25 participants with meth use completed the survey; 20 were interviewed (50% used heroin, 40% unstably housed). 35% were somewhat or extremely worried about COVID infection and 35% thought they were somewhat to very likely to get infected with COVID. Three themes emerged from the interviews; 1) increase in meth use including using to comply with the new guidelines, loss of routine, and lost recovery opportunities; 2) interplay of meth obtention and COVID including a description of risk-mitigation strategies or continuing use "as usual" 3) interactions with healthcare which were influenced by historical mistrust and difficulty with internet-based recovery tools.
Conclusions: People who use meth are at risk for COVID-19 and for meth-related harm due to increased use and mistrust in healthcare institutions. Understanding these complex interactions can aid in developing patient-centered risk-mitigation strategies that could be used in the ED.

M146. Endogenous and Exogenous Oxytocin Differentially Impact Stress Response on the Basis of Childhood Trauma Exposure

Erin Martin[*1], Nathaniel Baker[1], Julianne Flanagan[1], Jane Joseph[1], Aimee McRae-Clark[1]*
[1]*Medical University of South Carolina*
Abstract Detail Human
Select Drug Category Stimulants

Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: To assess the impact of childhood trauma on peripheral oxytocin levels in individuals with and without cocaine dependence, and to determine if trauma exposure and/or endogenous oxytocin levels predict degree of stress response following administration of exogenous oxytocin or a placebo.
Methods: Participants (n=110; n=61 cocaine dependent, n=49 control) completed one baseline visit and one laboratory stress session. Blood oxytocin and current anxiety (State-Trait Anxiety Scale) were measured at baseline, and trauma status was determined using the Childhood Trauma Questionnaire (scores >36 indicated trauma). At the stress session, participants randomly received oxytocin (24 IU intranasal) or placebo before completing three trials of the Montreal Imaging Stress Task interspersed with subjective measures of stress and anxiety (Within Session Rating Scale).
Results: More individuals with cocaine dependence scored above the threshold for presence of childhood trauma than controls (57% vs. 41%; p=.062). Compared to those without trauma, women with trauma had lower, and men with trauma had higher levels of peripheral oxytocin. Peripheral oxytocin was negatively correlated with state anxiety at baseline in individuals without trauma (ρ=-.487; p=.002); this did not differ by sex. Following stress exposure, trauma was associated with greater subjective stress (p=.052) and anxiety (p=.096). Exogenous oxytocin attenuated these indices in individuals without trauma but exacerbated them in individuals with trauma. Endogenous oxytocin did not predict stress or anxiety response in individuals with trauma regardless of treatment condition, but higher oxytocin levels were associated with worse stress in individuals without trauma that received placebo vs. oxytocin (p=.008).
Conclusions: Exogenous oxytocin administration exacerbated the stress response in trauma-exposed individuals, and persons with cocaine dependence more frequently reported trauma. Peripheral oxytocin predicted stress response only in individuals without trauma and did not mediate efficacy of exogenous oxytocin. This influence of childhood trauma must be considered when implementing oxytocin-based addiction treatment.

M147. Temporal Characterization of U50,488 and LY2444296 in Kappa Opioid Receptor Mediated Behavioral and Neuroendocrine Assays

Michelle Morochnik[1], Ariel Ben-Ezra[1], Philip Pikus[1], Amelia Dunn[1], Brian Reed[1], Mary Jeanne Kreek[1]*
[1]The Rockefeller University
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Pharmacology
Abstract Category Original Research
Aim: The Kappa Opioid Receptor (KOPr) is a potential pharmacological target for the treatment of psychostimulant addiction. Well-characterized tool compounds are valuable not only to evaluate novel compounds, but also to better understand the role KOPr plays in normal and dysfunctional neurophysiological processes. U50,488 (U50) is a commonly used reference agonist in in vivo KOPr studies, whereas LY2444296 (LY) is a recently developed short-acting KOPr selective antagonist. Parameters important to utilizing these compounds have not yet been fully investigated. Clarifying the pharmacokinetics of these compounds is invaluable for interpreting data for novel KOPr targeting pharmacotherapeutics.
Methods: Rotarod: Following training, male mice were tested at 0, 30, and 60min following treatment with U50 (10mg/kg) or saline. The effect of 30min, 6hr, and 24hr pretreatment with LY (3mg/kg) on U50 was measured. Prolactin: Serum prolactin levels were accessed in stress-minimized mice treated with vehicle or U50 (10mg/kg) at varying timepoints (15, 30, 60, or 240 min), with or without LY blockade (3mg/kg).
Results: U50 induces rotarod discoordination in a dose dependent manner. Further, U50 (10mg/kg) induces both rotarod sedation and prolactin release (a biomarker of kappa agonism) at timepoints up to 1hr but not 2hr post administration. LY (3mg/kg) blocks U50 (10mg/kg) induced rotarod incoordination at 30min but not 6hr.
Conclusions: The effects of U50 diminish between 1- and 2-hours post administration, at a dose of 10mg/kg. The time-course and dose-response of U50 for prolactin stimulation and rotarod incoordination are similar. Meanwhile, the duration of activity of a KOPr selective dose (3mg/kg) of the short acting kappa antagonist LY is less than 6 hours. Further investigations of the time-course of activity of LY will help guide future preclinical behavioral/neuroendocrine studies.

M148. Shifts in Black Market Drug Transactions During the COVID-19 Pandemic: Analysis of Crowd-Sourced Transaction Reports

Richard Olson[1], Kevin May[1], Joshua Black[1], Gabrielle Bau[1], Sabrina Lor[1], Richard Dart[1]*
[1]*Rocky Mountain Poison & Drug Safety*

Abstract Detail Human
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Category Original Research

Aim: The COVID 19 pandemic and subsequent economic and social changes have had a documented impact on drug use in the United States. However, little is known about the changes that may have been seen in the illicit drug market. StreetRx.com obtains data concerning the black-market drug economy through crowdsourcing and has been used to document changes over time in drug trade and prices. This study analyzed black market drug reporting patterns to detect changes during the COVID-19 pandemic
Methods: StreetRx.com collected sale price of drug diversion transactions for prescription and illicit stimulants, sedatives, antidepressants, and pain relievers from 2015 through 2020. These reports of illicit street sales were entered by website users who had participated in or heard about the sales. Submissions from the March to June 2020 timeframe were compared to submissions in the same period in past years (March to June 2015, March to June 2016, etc.).
Results: The total number of submissions collected during the 24-month, non-contiguous observation period was 111,943. The COVID time period demonstrated a higher proportion of stimulant submissions when compared to previous years (46.0% vs 30.3%, 29.5%, 35.2%, 39.8%, 38.2% respectively), and a lower proportion of opioid submissions (28.7% vs 50.3%, 47.6%, 46.2%, 43.4%, 41.5% respectively). Non-opioid pain relievers and antidepressants have increased, and sedatives have decreased over time, but these changes were in line with the observed trends leading up to 2020. No notable changes were observed in drug price during the pandemic period.
Conclusions: The results of this analysis show that there was a marked shift in the illicit market associated with the COVID-19 pandemic as captured by StreetRx. The stimulant share of submissions increased by over 7% from the previous year, and the opioid share of submissions decreased by over 12%. Other drug classes continued previous trajectories.

M149. Stigma, Discrimination and Crystal Methamphetamine ('Ice')

Steph Kershaw[1], Hannah Deen[1], Nicola Newton[1], Lexine Stapinski[1], Louise Birrell[1], Jennifer Debenham[1], Katrina Champion[1], Frances Kay-Lambkin[2], Maree Teesson[1], Cath Chapman[1]*
[1]*The Matilda Centre for Research in Mental Health and Substance Use at the University of Sydney,* [2]*The Centre for Brain and Mental Health Research at the University of Newcastle*

Abstract Detail Human
Select Drug Category Stimulants
Topic Harm Reduction
Abstract Category Original Research

Aim: Crystal methamphetamine attracts an elevated level of negative attention in Australia and internationally, however there is a paucity of research into stigma surrounding this drug. This study aimed to investigate and compare levels of public stigma, self-stigma and discrimination surrounding crystal methamphetamine use in a large Australian sample.
Methods: A cross-sectional online survey, open to all Australian residents aged 18 years and over, was conducted from November 2018 to March 2019 examining stigmatising attitudes towards people who use crystal methamphetamine. Respondents also reported any personal history of crystal methamphetamine use and experiences of discrimination. Multiple linear regression examined whether prior crystal methamphetamine use was associated with holding stigmatising attitudes. Covariates included in the analysis were presence of a family member or friend who uses crystal methamphetamine, knowledge about crystal methamphetamine, gender, age and region.
Results: A total of 2108 Australian participants completed the study (mean age = 36.3 years; 59% females; 27% had used crystal methamphetamine). Stigmatising attitudes were prevalent, particularly among those who hadn't used crystal methamphetamine ($p<.001$). Others more likely to endorse stigmatising attitudes included females ($p=.004$ vs. males), individuals with less knowledge about crystal methamphetamine ($p<.001$) and those living in

regional (p<.001) and rural/remote locations (p<.001) compared to metropolitan areas. Many participants reported being discriminated against because of their crystal methamphetamine use.
Conclusions: Stigma and discrimination surrounding crystal methamphetamine use was common in this sample, with public stigma more prevalent than self-stigma. This highlights a need for stigma reduction initiatives. Given higher levels of knowledge were associated with less stigmatising attitudes, public education campaigns providing accurate, evidence-based information about crystal methamphetamine along with guidelines and support for accurate media reporting, present promising approaches to stigma reduction.

M152. Neonatal Abstinence Syndrome Primer, Reference, and Decision Support Tool for Providers: A Phase II Training Pilot

Sterling McPherson[1], Ekaterina Burduli[2], Crystal Smith[2], Theresa Bowden[2], Ron Kim Johnson[2], Maureen Shogun[2]*
[1]Washington State University, Elson S. Floyd College of Medicine, [2]Washington State University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: To describe the usability and efficacy of a computerized online training and competency evaluation support tool for nurses utilizing the Finnegan Neonatal Abstinence Scoring Tool (FNAST) protocol for Neonatal Abstinence Syndrome (NAS) care, with embedded interactive education and reference modules.
Methods: We tested the usability and efficacy of an online, interactive instruction training on Neonatal NAS management with n=39 nurses. Participants completed surveys on pre- and post-training knowledge competency regarding NAS management and post-training course evaluation with recommendations for tool improvement. Training consisted of seven video modules and related quizzes. The training took approximately 2 hours. Participants were awarded 2 hours of Continuing Nurse Education (CNE) credit for a score of 80% or above for a multiple-choice exam. Participants were then given two video simulations of NAS scoring to rate using the decision support entry method.
Results: Self-reported NAS management knowledge scores increased from pre-training (M=3.41, SD=.88) to post-training (M=4.44, SD=.59), (t = -7.602, df = 38, p<.01). Simulations with fewer symptoms tended to be scored higher than the more complex simulations, particularly those involving scoring of tremor severity. The two-stage evaluation noted significant differences between the ability to answer CNE questions and apply the learning in a complex evaluation scenario.
Conclusions: The tool appears to be acceptable by nurses and efficacious in increasing NAS knowledge and competency among nurse NAS care providers. The strong ratings across the users provide necessary support to further test the tool's efficacy in a practice/hospital setting while assessing the impact on clinical outcomes such as newborn hospital length of stay.

Tuesday, June 22, 2021

Virtual Poster Q&A Session II: Alcohol

T1. Sex Differences in Reported Adverse Impacts of COVID-19 Lockdown Among Early-Stage Alcohol Use Disorder Recovery Patients

Alba Gonzalez-Roz[1], John F. Kelly[2], James MacKillop[3]*
[1]University of the Balearic Islands, [2]Massachusetts General Hospital, [3]McMaster University
Abstract Detail Human
Select Drug Category Alcohol
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: The COVID-19 disease has caused devastating lifestyle and mental health impairments globally, placing individuals in substance use recovery at increased risk of relapse. The study was three-fold: 1) to identify latent subgroups that exhibit differential psychosocial and experiential impacts, 2) to examine the main and interactive effects of sex and group membership on depression and anxiety, and 3) to assess whether percentage of heavy drinking days (%HDD) during the pandemic works as a mediator in the tested relationships. Distinct subgroups of

patients differentially impacted by the COVID-19 were hypothesized. Sex differences were also anticipated in the mediational effect of %HDD.
Methods: 125 alcohol use recovery patients [% males: 57.6; age M= 49.11] were recruited from two sites (Boston, US, Hamilton, Canada), between 28th May-29th June 2020. A Latent Class Analysis was conducted considering several psychosocial (e.g., education, quality of life) and experiential COVID-related domains (e.g., life disruption). A moderated mediation model was conducted to test the conditional indirect effect of sex on the pathways between class, depression (PHQ-9), and anxiety (GAD-7) through %HDD.
Results: Two latent classes [C1: n= 41, C2: n= 84] emerged. Class 2 was characterized by comparatively higher lockdown impacts. There were significant main effects of Class on depression [C1: M= 4.68, SD= 3.30, C2: M= 9.55, SD= 5.70; β=4.99, p<.001] and anxiety [C1: M= 3.68, SD= 3.95; C2: M= 8.62, SD= 5.61; β=4.81, p<.001]. The significant sex*class interaction indicated that female sex indirectly predicts depression [point estimate = .83, SE= .39; 95%CI: 0.198, 1.696] and anxiety [point estimate = .75, SE= .37; 95%CI: 0.135, 1.594] through higher %HDD; this effect was not found for males.
Conclusions: Two discrete latent subgroups with differential psychosocial impacts were identified. Continuing monitoring and reinforced addiction care support, particularly among women, should be provided to those in alcohol use recovery.

T2. The Association Between Overall Belonging and Binge Drinking Among College Students

Alyssa Berger[*1], Laura Gonzalez Paz[1], Anna Wang[1], Zoe Martusewicz[1]*
[1]University of Florida
Abstract Detail Human
Select Drug Category Alcohol
Topic Epidemiology
Abstract Category Original Research
Aim: Overall belonging in school may be associated with binge drinking in college students. To test the hypothesis that low overall belonging would be associated with an increased prevalence of binge drinking, we defined the variable to include a student's perceived sense of belonging along with their school activity participation.
Methods: Data were obtained from 75,824 college students enrolled in US collegiate institutions through an online survey of the Healthy Minds Study from 2017-2019 and included factors thought to be related to students' overall belonging and binge drinking (age, sexual orientation, financial situation, housing, and GPA). Logistic regression models estimated odds ratios and corresponding 95% confidence intervals. A secondary analysis was performed to assess the association between the belonging variable on its own (perceived sense of belonging) and binge drinking.
Results: Overall, 38% of students met criteria for binge drinking. Students 21-22 years old (3.053; CI: 2.875, 3.243) had the highest odds of binge drinking followed by high overall belonging (1.510; CI: 1.443,1.579), living off campus (1.439; CI: 1.386,1.493), a self-reported B average (1.303; CI: 1.261,1.346), and sometimes to always stressed regarding their financial situation (1.065; CI: 1.030,1.101). Additionally, high perceived sense of belonging was separately associated with binge drinking (1.456; CI: 1.408, 1.506).
Conclusions: While results contradicted our hypothesis (low overall belonging associated with binge drinking), they demonstrated high overall belonging was associated with binge drinking. There was a slightly stronger association for overall belonging compared to the assessment for perceived sense of belonging separately. Therefore, the combined variables (perceived sense of belonging and activities) may have a synergistic effect on binge drinking. However, more research is needed to understand the interaction between perceived belonging and school activity and its effects on binge drinking. Future research should also directly assess for the association between school activity and binge drinking.

T3. Trajectories of Drinking Days in U.S. Adults During the COVID-19 Pandemic

Courtney Nordeck[*1], Kira Riehm[1], Emily Smail[1], Calliope Holingue[1], Jeremy Kane[2], Renee Johnson[1], Cindy Veldhuis[3], Luther Kalb[1], Elizabeth Stuart[1], Frauke Kreuter[4], Johannes Thrul[1]*
[1]Johns Hopkins Bloomberg School of Public Health, [2]Columbia University Mailman School of Public Health, [3]Columbia University School of Nursing, [4]University of Maryland College Park

Abstract Detail Human
Select Drug Category Alcohol
Topic Epidemiology
Abstract Category Original Research
Aim: To examine changes in drinking behavior among US adults between March 10 and July 21, 2020, a critical five-month period during the COVID-19 pandemic.
Methods: Participants were 4,298 adults from the nationally representative Understanding America Study, who were surveyed at baseline between March 10-31, 2020, with eight waves of follow-up assessments between April 1 and July 21, 2020. Mixed-effects linear regression was used to examine the association between date and self-reported frequency of drinking days in the past 7 days, among the overall sample and among sociodemographic subgroups defined by sex, age, race/ethnicity, household structure, federal poverty line (FPL), and census region.
Results: Compared to March 11, the number of drinking days per week was higher on April 1 by an average of 0.36 days (95% CI=0.30, 0.43), on May 1 by an average of 0.55 days (95% CI=0.47, 0.63), on June 1 by an average of 0.41 days (95% CI=0.33, 0.49), and on July 1 by an average of 0.39 days (95% CI=0.31, 0.48). Men, White participants, and older adults reported sustained increases in drinking days over the study period.
Conclusions: Between March and mid-July 2020, adults in the US reported increases in the number of drinking days, with sustained increases observed among men, White participants, and older adults. Monitoring changes in drinking behavior during the COVID-19 pandemic is an important priority for public health surveillance. Efforts to inform the public about alcohol-related health risks, as well as screening and support for unhealthy alcohol use are needed.

T4. Validity of the DSM-5 Craving Criterion for Alcohol, Tobacco, Cannabis, Cocaine, Heroin, and Non-Prescription Use of Prescription Painkillers (Opioids)

Dvora Shmulewitz[*1], Malka Stohl[2], Eliana Greenstein[2], Efrat Aharonovich[2], Deborah Hasin[1]*
[1]Columbia University, [2]New York State Psychiatric Institute

Abstract Detail Human
Select Drug Category Alcohol
Topic Substance Use Disorder
Abstract Category Original Research
Aim: DSM-5 substance use disorder (SUD) diagnostics include a new criterion assessing craving, a strong desire/urge to use a substance, but little is known about the validity of the substance-specific craving criteria. We assessed validity by examining association between craving and variables expected to be related to craving (validators).
Methods: Substance users ≥18 years (N=588) were recruited from a clinical research setting and a substance addiction treatment program. DSM-5 SUD criteria were assessed for alcohol, tobacco, cannabis, cocaine, heroin, and opioids, with craving positive if "wanted to use so badly that couldn't think of anything else" (compulsion) or "felt a very strong desire or urge to use" (strong desire) was endorsed, and additional information on substance use, craving, and psychopathology was collected. Substance use was assessed daily for 90 days after the initial interview (baseline). For each substance, logistic regression estimated the association between the craving criterion/items and validators. Substance-related validators included use severity, alternate craving scales, DSM-5 SUD (without craving) measures, and daily substance use; mental health validators included DSM-5 psychiatric disorders and the Patient Health Questionnaire (PHQ-9) depression measure.
Results: Prevalence of craving was: alcohol (52.7%), tobacco (54.8%), cannabis (39.8%), cocaine (38.3%), heroin (23.0%), and opioids (11.4%). "Strong desire" showed greater prevalence then "compulsion". For each substance, craving was significantly associated with virtually all substance-related validators (p-values<0.05). Mental health validators were generally associated with craving for alcohol, tobacco, cannabis and cocaine; heroin and opioids craving were associated with the PHQ-9 (p's<0.05). Neither "strong desire" nor "compulsion" consistently showed greater association with the validators. For each substance, baseline craving significantly predicted use over the 90 days post-interview (odds ratios: 4.2 [alcohol] – 234.3 [heroin]; p's≤0.0001).
Conclusions: The DSM-5 craving criteria for alcohol, tobacco, cannabis, cocaine, heroin, and opioids, as operationalized here, are valid, supporting their inclusion in DSM-5 SUD.

T5. Causal Mechanisms of Impulsivity in Youth Alcohol Use

Matthew Gullo[*1], Sarah Bryant[1]*

[1]*University of Queensland*
Abstract Detail Human
Select Drug Category Alcohol
Topic Behavior
Abstract Category Original Research
Aim: Impulsivity is a risk factor for youth alcohol problems and comprises two key components: reward drive and rash impulsiveness. Reward drive reflects individual differences in approach motivation to reward, conveying risk through heightened positive alcohol expectancies and craving. Rash impulsiveness reflects individual differences in inhibitory control in light of potential negative consequences. It conveys risk through disinhibition and reduced self-efficacy. Survey-based studies support this two-factor conceptualisation. Evidence regarding causal mechanisms is more limited but could point to new intervention targets.
Methods: 120 young adults (aged 18-25; 52% men) completed a laboratory drinking task after being subjected to two impulsivity-related experimental manipulations. A 2 x 2 mixed between-within design was employed. Reward drive was manipulated through a film clip containing reward cues (vs neutral clip; between-subjects). Rash impulsiveness was manipulated through a covert manipulation that strengthened (or undermined) belief in one's capacity for impulse control (within-subjects). Outcomes of interest included laboratory alcohol consumption (ml) and behavioural disinhibition (perseveration errors). Data were analysed with multilevel modeling.
Results: Experimentally increasing state reward drive increased laboratory alcohol consumption ($p = .021$), as did increasing state rash impulsiveness to the extent that beliefs were changed ($p = .020$). The reward drive manipulation had a larger effect on alcohol consumption. Neither manipulation increased perseveration.
Conclusions: This preclinical study provides evidence of a causal relationship between distinct impulsivity pathways and youth alcohol use. Findings suggest that targeting reward drive-related mechanisms in youth alcohol interventions may have greater therapeutic potential than rash impulsiveness-related mechanisms.

T6. Gender Discrimination, Suicidal Ideation and the Role of Depression Among African American and European American Females

Manik Ahuja[*1], Kathleen Bucholz*[2]
[1]*East Tennessee State University,* [2]*Washington University School of Medicine*
Abstract Detail Human
Select Drug Category Alcohol
Topic Disparities
Abstract Category Original Research
Aim: Gender discrimination among females has been linked to drug use and other adverse outcomes. Its relationship with suicidal behaviors has not been extensively explored. We focused on the association between gender discrimination and suicidal ideation and evaluated the moderating effect of major depressive disorder (MDD) in a sample of African American (AA) and European American (EA) females.
Methods: Data (n=735) are extracted for female participants from the Missouri Family study (MOFAM) (n=1,461), a longitudinal high-risk family study of AA and EA adolescents and young adults. Cox proportional hazards were conducted to test the association between gender discrimination and the age of suicidal ideation, along with the moderating effect of MDD. Psychiatric risk factors including childhood sexual abuse, prior alcohol, mothers' suicidal ideation, mothers' depressive symptoms, along with controls (age, family risk, income, education) were included in the analyses.
Results: Overall, 35.1% of females reported lifetime gender discrimination, 11.6% of women reported both depression and gender discrimination, while 24.5% of women reported gender discrimination without depression. Gender discrimination was associated with an increased hazard of suicidal ideation (RRR: 1.94 [95% CI: 1.49-2.54]). When examining the moderating effect of MDD, gender discrimination with report of MDD was associated with an increased hazard of suicidal ideation (RRR: 3.80 [95% CI: 2.77-5.20]), while no association was found between gender discrimination without MDD (RRR: 1.29 [95% CI: 0.93-1.78]). Mother's suicidal ideation (RRR: 1.56 [95% CI: 1.09-2.25), age of alcohol initiation (RRR: 1.99 [95% CI: 1.40-2.82]), and childhood sexual abuse (RRR: 2.02 [95% CI: 1.50-2.71]) were also positively associated with suicide ideation.
Conclusions: The findings reveal a strong association between gender discrimination and suicidal ideation, moderated by depression. It is recommended that mental health treatment providers and clinicians consider querying females on experiences such as gender discrimination, as there is potential for severe mental health consequences among victims.

T7. Sex Differences in Specific Aspects of Two Animal Models of Anxiety-Like Behavior

Frederic Hopf[1], Thatiane De Oliveira Sergio[2], Leah Wetherill[1], Claudina Kwok[3], Farrah Khoyloo[3]*
[1]Indiana University, [2]Indiana University and University of California, San Francisco, [3] University of California, San Francisco

Abstract Detail Animal Study
Select Drug Category Alcohol
Topic Behavior
Abstract Category Original Research

Aim: Anxiety disorders are highly prevalent, costing >700 billion US$ globally. In addition, negative affective states contribute significantly to development and expression of addiction. Importantly, women are at greater risk of developing anxiety disorders, and have significantly increased alcohol addiction in recent years. Thus, it critical to understand sex-specific mechanisms to help develop more effective treatments for anxiety, addiction, and co-morbidity. However, it is quite challenging to separate biological and social/cultural contributions in humans, therefore animal models can provide valuable insights into sex differences in biological mechanisms.
Methods: As a pre-step to investigating anxiety contributions to pathological alcohol intake, we examined putative anxiety-like behaviors in large samples (n=15-18) of single-housed female and male adult Wistar rats in two classical rodent anxiety-like tests. Novelty suppression of feeding (NSFT) involves food under a bright light in a food-deprived animal, while the light-dark test (LDT) reflects innate aversion to bright light. We also determined whether particular anxiety-like measures were impacted by moderate diazepam. Principle Component Analyses (PCA) examined possible inter-relatedness of behavioral measures.
Results: NSFT responses with the most direct interaction with food, latency to grab food and food consumed, indicated significantly more anxiety in females than males, and diazepam altering these behaviors in females but not males (both $p<0.01$). Most other NSFT and LDT measures showed more similar diazepam effects across sexes, with evidence of reduced LDT anxiety-like behavior in females. PCA indicated limited relationships across behavioral factors, underscoring previously suggested importance of assessing multiple measures to maximize information and ethological relevance.
Conclusions: Combining our findings and previous studies, we speculate about a novel model where greater female anxiety-like behavior relates to conditions with a specific, anxiety-related focus. Our findings also validate NSFT and LDT measures in females, and underpin our future studies addressing anxiety-related physiological and neuronal signals and their relation to pathological alcohol drinking.

Virtual Poster Q&A Session II: Cannabis/Cannabinoids

T8. Elucidation of Long-Chain Endocannabinoid Binding Modes With Cannabinoid 1 (CB1) and Cannabinoid 2 (CB2) Receptors

Alexander Williams[1], Jing-Fang Yang[1], Nasimha Penthala[2], Paul Prather[2], Peter Crooks[2], Chang-Guo Zhan[1]*
[1]University of Kentucky, [2]University of Arkansas for Medical Sciences

Abstract Detail Animal Study
Select Drug Category Cannabis/Cannabinoids
Topic Chemistry
Abstract Category Original Research

Aim: The cannabinoid (CB) receptors (CB1R and CB2R) represent a promising therapeutic target for several indications such as nociception and obesity. Currently known ligands commonly lack selectivity for either receptor, which can be linked to the high similarity between the proteins' binding sites. Long-chain endocannabinoids display high selectivity towards CB1R however the lack of crystal structures containing these ligands has kept their binding mode elusive.
Methods: The long-chain endocannabinoids, along with other interesting ligands, had their binding modes elucidated through a combination of molecular docking and molecular dynamics (MD) simulations along with molecular mechanics-Poisson-Boltzmann surface area (MM-PBSA) binding free energy calculations.
Results: The binding poses for these long-chain endocannabinoids revealed a previously unknown binding site surrounded by transmembrane (TM)2, TM7, and extracellular loop (ECL)2. This site is vital for providing the long-chain endocannabinoids with their selectivity for CB1R. The residue I267 within this binding site is especially important due to its steric effects on the long chain endocannabinoids. Additionally, the free energy

estimations performed on these obtained long-chain endocannabinoids' binding modes are in good agreement with the known experimental data, further suggesting their validity.
Conclusions: Considering these in silico insights, the future rational design of new selective ligands for CB1R and CB2R may be focused on favorable interactions with this newly discovered binding site near the extracellular interface of the CB1R receptor. Additionally, this computational strategy may prove fruitful with other GCPR or membrane bound proteins.

T9. Does Comorbid ADHD Impact the Severity of Cannabis Problems and Likelihood of Cannabis Abstinence in Adults Receiving N-Acetylcysteine for Cannabis Use Disorders?

Christopher Hammond[*1], Ariel Pollack[1], Jun Tarashi[1], Grace Park[1], Keri Rosch[2], Stewart Mostofsky[2]*
[1]Johns Hopkins University School of Medicine, [2]Kennedy Krieger Institute
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Comorbidities
Abstract Category Original Research
Aim: Attention deficit/hyperactivity disorder (ADHD) is associated with elevated rates of cannabis use and is common in adults seeking treatment for cannabis use disorder (CUD). The impact of comorbid ADHD on the presentation, severity, and treatment course for CUD is poorly understood. In the present study we examined the impact of ADHD diagnostic status on cannabis-related impairment and cannabis abstinence in adults with CUD during and following N-acetylcysteine (NAC) treatment.
Methods: Data used in this post-hoc analysis was from 302 adults diagnosed with CUD including N=65 with and N=237 without comorbid/co-occurring ADHD who participated the Achieving Cannabis Cessation-Evaluating N-Acetylcysteine Treatment study (ACCENT, NIDA-CTN-0053), a double-blind randomized placebo-controlled 12-week trial of NAC in combination with contingency management for treatment of CUD. Baseline clinical profiles were compared across participants with CUD stratified by ADHD diagnostic status. Generalized estimating equation models (GEE) and logistic regressions examined ADHD and ADHD-by-treatment condition interaction effects on the likelihood of negative urine cannabis tests (UCT) weekly during treatment and 1-month following treatment completion.
Results: At baseline, participants with CUD and comorbid ADHD (CUD/ADHD) compared to participants without ADHD reported greater cannabis cravings (MCQ: 59.0 vs. 47.5, $p<0.001$), cannabis-related problems (MPS: 12.5 vs. 7.8, $p < 0.001$), and compulsivity of cannabis use (OCDU: 25.0 vs. 20.5, $p < 0.001$). ADHD did not predict negative UCT, but an ADHD-by-treatment interaction was observed. Participants with CUD/ADHD who were randomized to NAC had significantly more negative UCT during treatment (19% vs. 14%, $p=0.05$) compared to those randomized to placebo. Among participants without ADHD, treatment assignment had negligible impact on negative UCT rates (22% vs. 22%, NS).
Conclusions: These findings suggest that comorbid ADHD in adults seeking treatment for CUD is associated with greater cannabis-related impairments at baseline. Furthermore, they provide preliminary evidence that NAC may increase the likelihood of cannabis abstinence in adults with CUD/ADHD.

T10. Risk Factors for Continued Cannabis Use During Pregnancy

Chelsea Pike[*1], Michael Sofis[1], Alan Budney[1]*
[1]Geisel School of Medicine at Dartmouth
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: Cannabis use is increasingly common among pregnant women despite concern that it may be linked to adverse outcomes. The goal of this study was to determine whether variables commonly associated with cannabis use predict whether women continue or quit using during pregnancy.
Methods: Pregnant women who regularly used cannabis before pregnancy (n = 296) were recruited via Facebook. 41% reported quitting, 45% reduced use or quit but relapsed, and 15% continued using at about the same rate after learning they were pregnant. Sociodemographics, cannabis use characteristics, cigarette use, perceived risk and benefit, delay discounting (DD), and communications about cannabis use with their doctor were assessed.

Cannabis status groups (quitters, relapsers/reducers, continued users) were compared using chi-square, ANOVA, and multinomial logistic regression analyses.
Results: The multinomial regression showed that compared to quitters, continuing cannabis use during pregnancy was associated with less perceived risk (RR = .81, 95% CI [.75, .87]), using cannabis more days/week prior to pregnancy (RR = .09, 95% CI [.01, .841]), and using cigarettes prior to pregnancy (RR = 3.65, 95% CI [1.29, 10.35]). Being unemployed ($p < .001$), reporting that the pregnancy was not intended ($p < .01$), higher DD ($p = .04$), perceiving greater benefit of use ($p < .001$), and having a doctor discuss benefits of prenatal use ($p < .05$) were associated with continued prenatal use, but did not retain significance in the regression.
Conclusions: Identification of these risk factors provides potential targets for prevention or intervention strategies. However, much more research is needed to understand prenatal cannabis use and its effects in order to better educate women and healthcare providers, and to inform intervention development.

T11. Marijuana Use Among Youth Using E-Cigarettes: A Qualitative Analysis

Danielle Davis[*1], Krysten Bold[1], Asti Jackson[1], Dana Cavallo[1], Grace Kong[1], Suchitra Krishnan-Sarin[1]*
[1]Yale University School of Medicine
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: Among youth, e-cigarette use has been shown to be associated with increased likelihood of marijuana use. However, among youth who use e-cigarettes, forms of marijuana use, reasons for marijuana use, and patterns of marijuana use are not well-established. The aim of the current study is to utilize qualitative data to better understand marijuana use among youth who use e-cigarettes.
Methods: Six focus groups were conducted in 2019 among high school youth who reported current e-cigarette use (N=50; 46% female) to inform e-cigarette cessation interventions. Groups assessed reasons for use and quitting experience with e-cigarettes. Youth were also asked about use of e-cigarettes to vape marijuana, and about marijuana use behavior generally. Focus group transcripts were examined for reports of marijuana use, reasons for liking marijuana, and co-use of marijuana products and nicotine e-cigarettes (i.e. use of products at the same time).
Results: A common theme of marijuana use was using e-cigarettes to vape marijuana, however, use of marijuana in other forms (e.g. blunt use, smoking) were also discussed. Youth reported liking marijuana because of psychoactive effects (e.g. high), its ability to reduce negative feelings (e.g. anxiety, boredom), and ease of obtaining. Regarding using nicotine and marijuana concurrently, youth report using nicotine e-cigarettes at the same time as both vaping and smoking marijuana to experience a stronger psychoactive effect than using marijuana alone and needing to use less product overall (e.g. requiring less “hits” to feel effects) when using concurrently. Youth also reported more intense physical sensations as both a positive and negative feature of concurrent use.
Conclusions: Our qualitative evidence suggests that youth who use e-cigarettes commonly use marijuana and use marijuana in conjunction with nicotine e-cigarettes to experience stronger psychoactive effects. Research and interventions targeting youth e-cigarette users should consider the interactions between marijuana and e-cigarette use in this population.

T12. The Impact of Social Network Characteristics on Cannabis Use Among Cannabis-Using Young Adults in Los Angeles: The Moderating Role of Medicinal and Recreational Use Motives

Graham DiGuiseppi[*1], Ekaterina Fedorova[2], Stephen Lankenau[2], Jordan Davis[1], Carolyn Wong[3]*
[1]University of Southern California, [2]Drexel University, Dornsife School of Public Health, [3]Children's Hospital Los Angeles and University of Southern California
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: Young adults aged 18-25 have the highest rates of cannabis use in the U.S and comprised 25% of all cannabis users in 2019. Although there is strong empirical support that social factors are associated with young people’s substance use behaviors, little is known about how social network structure (e.g., size, density) and

attitudes toward cannabis in one's social support and/or cannabis-using network, account for young adults' cannabis use behavior. Previous findings also indicate that both young adult medical cannabis patients (MCPs) and non-patient users (NPUs) report using cannabis for a variety of medicinal and recreational reasons. In California where medical and recreational cannabis can be accessed legally, does social network influence vary depending on young adults' motives for use? The current study sought to address these questions.
Methods: Young adult (aged 19-27) MCPs (n=182) and NPUs (n=142) in Los Angeles reported their cannabis practices, cannabis use motives (primarily recreational to primarily medicinal using a 5-point scale) and named up to 10 people who provided social support and/or used cannabis with them. Average perceived network attitudes towards cannabis and egonetwork density were also calculated. Negative binomial regression models examined associations between network characteristics and past 90-day cannabis use, controlling for motives and patient status; separate models tested interactions between cannabis motives and network characteristics.
Results: Cannabis user network size (AIRR=1.05, p=0.03) and positive network attitudes toward cannabis (AIRR=1.15, p=0.03) were associated with more frequent use. Cannabis user network size interacted with cannabis motives (AIRR=0.97, p=0.02), which was positively associated with cannabis use frequency among recreational, but not medicinal users.
Conclusions: While cannabis user network size and positive network attitudes towards cannabis are associated with more frequent cannabis use among young adult users, having a larger cannabis network led to significantly higher recent use among those who primarily used cannabis recreationally.

T13. The Impact of COVID-19 on Cannabis and Alcohol Use Among Young Adult Cannabis Users in Los Angeles

Ekaterina Fedorova[*1], Carolyn Wong[2], Bridgid Conn[3], Janna Ataiants[4], Ellen Iverson[3], Stephen Lankenau[4]*
[1]Drexel University, Dornsife School of Public Health, [2]Children's Hospital Los Angeles and University of Southern California, [3]Children's Hospital Los Angeles, [4]Drexel University Dornsife School of Public Health
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Epidemiology
Abstract Category Original Research
Aim: The COVID-19 pandemic has caused extreme health and socio-economic consequences in the U.S. and worldwide. A safer-at-home directive was ordered in Los Angeles, California on March 19, 2020 as a public health response to COVID-19 outbreak. The current study investigated COVID-19's impact on substance use among young adult cannabis users in Los Angeles.
Methods: Young adult cannabis users (both sexes; 24-32-year-old) with and without medical cannabis recommendations were surveyed quantitatively (n=108) and interviewed qualitatively (n=34) about COVID-19's impact on health and substance use in April-December 2020 in Los Angeles. Substance use, health, and socio-economic-changes related to COVID-19 were examined descriptively. Qualitative interviews explored reasons and context of changes in substance use immediately after and during the safer-at-home directive.
Results: 3.7% tested positive for COVID-19, 11.1% felt sick but didn't get tested, 9.3% had family member/friend/co-worker who died due to complications from COVID-19, 40.7% lost a job. 59.3% reported increasing use of either cannabis (47.6%) or alcohol (32.4%) or both (18.5%) due to the COVID-19 outbreak. Qualitative data revealed that increases in cannabis and alcohol use were attributed to boredom (e.g., staying at home) and lack of impediments (e.g., no direct supervision/driving to work). Participants frequently noted feeling lonely and many reported overwhelming experiences of anxiety about contracting COVID-19. Cannabis and alcohol were used to cope with a range of emotions, including depression and uncertainty about the future. For most, however, increases in substance use were temporary until more adaptive coping strategies were adopted (e.g., skating, meditation, hiking, developing higher quality relationships with loved ones), as participants adjusted to "a new normal."
Conclusions: While the majority of participants reported increases in cannabis or alcohol use or both to ease mental health issues and/or adjust to new realities associated with the pandemic, cannabis and alcohol use declined as participants engaged in more adaptive coping strategies.

T14. Cannabis Culture, Consumption, and Implicit Cognition: A Cross-Cultural Study of Dutch and American Cannabis Users

Francesca Filbey[1], Lauren Kuhns[*2], Suhaavi Kochhar[2], Jennifer DiMuzio[1], Emese Kroon[2], Janna Cousijn[2]*

[1]University of Texas at Dallas, [2]University of Amsterdam
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Implicit cognition is relevant in the cross-cultural study of cannabis use disorder because substance use disorders are often theorized as a result of automatic processing of substance-related stimuli and norms of use. This study evaluated the relationship between perceived cannabis culture and cannabis use and cognitive biases in a cross-cultural sample of adult cannabis users in Texas, US and Amsterdam, NL.
Methods: 85 adult participants aged 18-30 were recruited using similar criteria from both sites. Of these, 37 CAN and 24 non-using controls (CON) were from NL (38 males) and 11 CAN and 13 CON from US (9 males). Outcome measures included the cannabis culture tightness-looseness scale, cannabis culture questionnaire, CUDIT-R, Cannabis Stroop Task and a stimulus response task, the Cannabis Approach Avoidance Task (CAAT).
Results: There was a main effect of site (US/NL; ($F(1, 75) = 20.56$, $p < 0.001$) and group (CAN/CON; $F(1,75) = 5.24$, $p < 0.001$), and an interaction effect ($F(1,75) = 7.53$, $p < 0.001$) on perceptions of cannabis culture. Participants in the US perceived more positive and less negative effects of cannabis than participants from NL. Participants from NL thought people perceived more positive effects and less negative effects than participants from US. An association between perceptions of cannabis and cannabis use was not found. Cannabis use was not correlated with attentional or approach biases.
Conclusions: The Netherlands and Texas, USA appeared to have unique cannabis cultures. There was a general perception that people in NL viewed cannabis more positively than people in Texas. However, participants in Texas themselves viewed the drug more positively than their Dutch counterparts. Perceptions of cannabis did not predict cannabis use and cognitive biases were not associated with cannabis use.

T15. Attitudes Toward Cannabis Use Among U.S. Army Reserve/National Guard Service Members: The Role of Military Service and Mental Health Symptoms

Jessica Kulak[1], D. Lynn Homish[2], Lynn T. Kozlowski[2], Cierra A. Balfour[1], Gregory Homish[2]*
[1]Buffalo State College, [2]State University of New York at Buffalo
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Epidemiology
Abstract Category Original Research
Aim: Understanding issues related to cannabis use may be particularly relevant to reserve and National Guard service members as they navigate potentially conflicting state laws and federal regulations in their roles as citizen soldiers. Given this, and in light of recent calls to increase access to medicinal cannabis for U.S. veterans, there is a need to better understand how cannabis is being perceived by soldiers. This research characterizes attitudes towards cannabis use among soldiers and explores these attitudes in the context of military service and mental health symptoms.
Methods: Data come from Operation: SAFETY (Soldiers And Families Excelling Through the Years) a study of U.S. Army Reserve/National Guard (USAR/NG) soldiers and their spouses. The current sample was comprised of 374 soldiers. Negative binomial regression models examined the relation between cannabis attitudes and mental health symptoms while considering military service.
Results: Soldiers had significantly greater approval for medicinal use (66.6%) compared to recreational use (31.3%; $t(373) = 14.68$, $p < 0.001$). Male and female soldiers reported high prevalence of approval (65.1% and 72.2%, respectively) for medical cannabis use. Soldiers with a history of PTSD symptoms (AOR = 1.01, 95% CI = 1.01, 1.02) or anxiety (AOR = 1.02, 95% CI = 1.01, 1.04) at baseline were associated with approval towards recreational cannabis use, but not medicinal use.
Conclusions: This study is one of the first to assess attitudes about cannabis use among USAR/NG soldiers. This is vital in an evolving time where legislation is changing regarding medicinal/recreational use, while the military maintains zero tolerance policies. Soldiers show favorable attitudes toward cannabis use. Assessing attitudes is important, as they are strongly correlated with future use. Understanding soldiers' attitudes towards of cannabis use may also help to inform future policies around veteran access.

T16. Cannabis-Related Deaths in the U.S., 1999-2018

Joao Mauricio Castaldelli-Maia[*1], Silvia Martins*[1]
[1]*Columbia University*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Comorbidities
Abstract Category Original Research
Aim: Cannabis use has been associated in different countries with some underlying causes of death. In the U.S., passage of medical cannabis laws has been associated with increased cardiac-related mortality. Despite these facts, there is no evidence of any death directly related to cannabis toxicity only. Thus, it is important to explore the underlying causes of cannabis-related deaths.
Methods: We examined cannabis-related deaths identified in the National Vital Statistics System (NVSS), from 1999 to 2018. Multiple chi-square tests tested for distribution difference among sociodemographic groups. Then, 1999-2018 trends were analyzed by underlying cause of death group using joinpoint regression.
Results: We found a small number of cannabis-related deaths in the U.S. general population during the period (n=6,167, Crude Rate per 100,000 = 0.12). The most common underlying causes of death included overdoses (66.0%), accidents (15.6%, transport=11.4%, non-transport=4.2%), suicides (6.4%) and cardiovascular diseases (4.0%). Socio-demographic characteristics of decedents in types of cannabis-related deaths were mainly similar to socio-demographic characteristics in all deaths in the U.S. However, compared to all deaths in the U.S cannabis-related excess deaths were observed in cardiovascular, transport accident and homicide deaths.
Conclusions: Despite being in low number, cannabis related deaths are increasing in the U.S. We were able to identify some underlying causes and sociodemographic subgroups in which there was an excess of cannabis-related deaths, which should be the target of stronger and focal preventive interventions. The U.S. approach for cannabis-related mortality should be based on local data, because the epidemiological profile differs from that of other countries.

T17. Medical Cannabis Patients Demonstrate Cognitive and Clinical Improvements After One Year of Treatment

Kelly Sagar[*1], Mary Dahlgren[1], Ashley Lambros[2], Rosemary Smith[2], Celine El-Abboud[2], Staci Gruber[1]
[1]*McLean Hospital, Harvard Medical School,* [2]*McLean Hospital*
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Alternative Medicine
Abstract Category Original Research
Aim: Studies examining recreational cannabis users generally report cognitive decrements, particularly in those with adolescent onset; however, few studies have assessed the long-term impact of medical cannabis (MC) use on cognition. We assessed cognitive and clinical measures in well-characterized MC patients over one year. Based on previous findings, we hypothesized MC patients would not exhibit executive function decrements typically observed in recreational cannabis users.
Methods: As part of an ongoing longitudinal study, MC patients completed a baseline visit prior to initiating MC use and follow-up evaluations after one year of treatment. ANOVAs were utilized to examine 39 patients (23 female, 16 male) relative to baseline. Patients completed a neurocognitive battery assessing executive function (Stroop, Trail Making Test [TMT], Wisconsin Card Sorting Test [WCST], Letter-Number Sequencing [LNS]) and verbal learning/memory (Rey Auditory Verbal Learning Test). Clinical scales assessed mood (Profile of Mood States [POMS] Total Mood Disturbance, Beck Depression Inventory [BDI]), anxiety (Beck Anxiety Inventory [BAI], State Trait Anxiety Index [STAI]), and sleep (Pittsburgh Sleep Quality Index [PSQI]).
Results: Following one year of treatment, MC patients demonstrated improvements on several measures of executive function, specifically Stroop Interference Time, Trails A, WCST, and LNS (all ps<.05), and on clinical ratings (POMS , BDI, BAI, STAI Trait, and PSQI; all ps≤.02) relative to baseline. RAVLT and Trails B performance generally remained stable.
Conclusions: Results extend previous pilot findings that MC patients may exhibit improved executive function and clinical improvement after three months of treatment. Although current results contrast findings in recreational cannabis users, MC patients typically differ from recreational consumers in motives for use, cannabis product selection, and age of onset. Future studies are needed to identify mechanisms related to cognitive changes,

clarify the role of clinical improvement, and assess the impact of specific patterns of MC use, including frequency of use and exposure to specific cannabinoids.

T18. Placebo-Controlled Experimental Test of N-Acetylcysteine Effects on Cannabis Cue-Induced Craving and Seeking in Adult Cannabis Users

Leslie Lundahl[1], Mark Greenwald[2]*
[1]*Wayne State University School of Medicine,* [2]*Wayne State University*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Although Cannabis Use Disorder (CUD) is the most common substance use problem, currently no FDA-approved medication for CUD exists. Treatment studies investigating whether the antioxidant N-acetylcysteine (NAC) reduces cannabis use and craving have yielded mixed results. However, no studies have investigated effects of NAC in a controlled, laboratory setting. We developed a hybrid drug cue-exposure and choice procedure to examine mechanistic links among cannabis cue-exposure, craving, and seeking, and whether NAC disrupts these links.
Methods: Sixteen (9M) healthy adults with moderate-severity CUD who smoked daily (mean=15.9±10.5 yrs) were housed on an inpatient unit throughout testing. Over 4 sessions (Medication X Cue within-subject, placebo-controlled, randomized crossover), they received NAC (0 vs 2400 mg oral) pretreatment prior to cue (neutral vs cannabis) exposure, and in each session worked on a progressive ratio choice task to earn up to 11 puffs from placebo (0.0% THC, combined with $2/choice) vs cannabis (7.0% THC, without money) cigarettes. Self-administration of their choice immediately followed.
Results: Cannabis (vs neutral) cue-exposure significantly increased cannabis craving ($F(1,15)=5.80$, $p=.03$, partial $\eta 2 =.29$), and non-significantly increased active cannabis choice from 4.8 to 5.2 puffs ($F(1,15)=1.71$, $p=.21$, partial $\eta 2=.11$). Craving was not correlated with marijuana choice. A Medication x Cue interaction on cannabis craving ($F(1,15)=6.71$, $p=.024$, partial $\eta 2 =.36$) revealed that cue-elicited craving magnitude nearly doubled in the NAC vs placebo condition (mean difference 8.7 vs 16.2 pts). NAC did not significantly affect marijuana choice.
Conclusions: These data demonstrate NAC did not attenuate cue-induced drug craving or seeking in these chronic cannabis smokers; rather, it increased cue-induced cannabis craving. Thus, NAC seems unlikely to be an efficacious medication for CUD, at least among intensive cannabis users. Further studies are needed to evaluate this hybrid cue-exposure/choice paradigm for testing medications for CUD treatment.

T19. The Role of Cannabis in Pain Management Among People Living With HIV who use Drugs: A Qualitative Study

Koharu Loulou Chayama[1], Jenna Valleriani[1], Cara Ng[1], Rebecca Haines-Saah[2], Rielle Capler[1], MJ Milloy[3], Will Small[4], Ryan McNeil[5]*
[1]*British Columbia Centre on Substance Use,* [2]*University of Calgary,* [3]*University of British Columbia,* [4]*Simon Fraser University,* [5]*Yale School of Medicine*

Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Harm Reduction
Abstract Category Original Research

Aim: This study explores cannabis use for pain management among people living with HIV (PLHIV) who use drugs following cannabis legalization.
Methods: From September 2018 to April 2019, we conducted in-depth interviews with 25 PLHIV who use drugs in Vancouver, Canada to examine their experiences using cannabis to manage pain. Interviews were audio-recorded, transcribed, and coded. Salient themes were identified using inductive and deductive approaches.
Results: Most participants reported that using cannabis for pain management helped improve their daily functioning. Some participants turned to cannabis as a supplement or periodic alternative to prescription and illicit drugs (e.g., benzodiazepines, opioids) used to manage pain and related symptoms. Nonetheless, participants' access to legal cannabis was limited and most continued to obtain cannabis from illicit sources (e.g., illicit market,

illicit cannabis distribution programs), which provided access to cannabis that was free or deemed to be affordable.
Conclusions: Cannabis use may lead to reduced use of prescription and illicit drugs for pain management among some PLHIV who use drugs. Our findings add to growing evidence supporting the role of cannabis in pain management and harm reduction and suggest the need for concrete efforts to ensure equitable access to cannabis.

T20. Cannabis Use and Psychotic Experiences Among Emerging Adults of Color: The Role of Individual-Level Inequity

Neil Allicock[*1], Deidre Anglin[1]*
[1]The City College of New York
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Racial/Ethnic Differences
Abstract Category Original Research
Aim: Given the trend towards the federal legalization of recreational cannabis use, greater accessibility and reduced perceptions of harm may be problematic for populations vulnerable to its adverse mental health effects. A substantial body of literature documents the association between early cannabis use and increased risk of psychosis. Efforts to identify factors that explain this risk often overlook social contextual factors. For racial/ethnic minority youth, experiences of racial discrimination (EOD) and traumatic life events (TLE), which are also positively associated with psychotic experiences (PE), may be relevant contextual factors to explore.
Methods: This is a secondary analysis of a recently completed survey which examined social stressors in relation to psychosis risk among young cannabis users. Participants (N = 1799) were racial/ethnic minority emerging adults (Mage =19.95; SD (2.32); [18-36 years]; 62.9% female) attending an urban public university.
Results: A hierarchical linear regression (n=545) was used to test whether EOD and TLE moderated the association between age of onset of cannabis use and PE. Tests of 3-way interaction were significant (β=-.723, p=.033). The analysis indicated that the association between younger onset of cannabis use and PE was significantly stronger among racial/ethnic minorities with 1-3 or 4 or more TLE, regardless of EOD frequency.
Conclusions: These findings highlight the significance of the social context and age of cannabis initiation on mental health outcomes among young racial/ethnic minorities.

T21. Temporal Trends in Simultaneous Use of Alcohol and Cannabis Among U.S. Adolescent Boys and Girls

Navdep Kaur[*1], Pia Mauro[2], Silvia Martins[2], Katherine Keyes[1], Deborah Hasin[2], Mark Olfson[3], Qixuan Chen[2]*
[1]Columbia University Mailman School of Public Health, [2]Columbia University, [3]Columbia University and NYSPI
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: Simultaneous use of alcohol and cannabis to enhance each other's effect is common and damaging to adolescents. There are recent diverging time trends in overall use of alcohol and cannabis that also differ by gender, but little is known about trends in simultaneous use of these substances.
Methods: Data were drawn from the 2000-2019 Monitoring the Future surveys of N~179,000 US 12th graders. We created a 5-level measure including past-year simultaneous use, defined as use of alcohol and cannabis at the same time to enhance each other's effect. Other categories included no use, alcohol-use-only, cannabis-use-only, and past-year alcohol and cannabis use (not simultaneously). Multinomial logistic regression models estimated the association between alcohol/cannabis use and survey year (2000-2004, 2005-2009, 2010-2014, 2015-2019). Models adjusted for survey mode (paper vs. tablet), and included time interactions with sex, parental education, race/ethnicity, and lifetime cigarette use.
Results: Between 2000-2019, simultaneous use decreased from 5.6% to 3.4%. Alcohol-use-only decreased (53.7% to 30.1%), while cannabis-use-only remained stable before 2006 and increased thereafter (1.7% to 7.6%). Compared to no use in 2000-2004, risk of simultaneous (RRR=0.55, 95% CI: [0.48, 0.62]) and alcohol-use-only (RRR=0.48, 95% CI: [0.45, 0.52]) decreased in 2015-2019, while cannabis-use-only risk increased (RRR=2.58, 95% CI: [2.26, 2.95]). Risk of past-year simultaneous use and alcohol-use-only declined more rapidly for boys than girls, whereas risk for cannabis-use-only increased faster for girls than boys (interaction F=41.80, p<0.001).

Conclusions: There were slower reductions in simultaneous alcohol/cannabis use risk for girls than boys. Declines in simultaneous alcohol/cannabis use are largely concomitant with historical declines in alcohol use, portending further harm reduction associated with decreased adolescent alcohol use.

T22. COVID-Related Stress is a Moderator of College Students' Cannabis Use and Internalizing Symptoms

Shannique Richards[1], Sarah O'Neill*[2]
[1]The City College of New York, [2]The City College of New York and The Graduate Center
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: How does stress related to SARS-CoV-2 interact with cannabis use to affect internalizing symptoms among a diverse sample of college students?
Methods: N=81students (66.7% female) aged 18-25 years [mean=19.41 (SD=2.18) years] were recruited from a large, public, urban campus in the northeast US. The sample was ethnically (25% Latinx), racially (77.8% BIPOC) and socioeconomically diverse (family HHI<$60,000/year for 62.8%). Participants self-reported frequency of past week cannabis use and consequences of its consumption (lower energy levels, depression and anxiety severity). They also completed the COVID Stress Scales, which measured COVID-related distress across six domains. Of these, COVID traumatic stress symptoms ("COVID Trauma") and fear of the social and economic consequences of COVID ("COVID SEC") were correlated with greater internalizing symptoms and served as moderators in subsequent analyses. Individual moderation models run using Hayes' PROCESS tested whether "COVID Trauma" and "COVID SEC" moderated the association between frequency of cannabis use and internalizing symptom severity.
Results: 19% consumed cannabis on at least one day of the previous week. COVID Trauma (b=.16; 95% CI=.03-.30) and COVID SEC (b=.26; 95% CI=.05-.47) moderated the relation between frequency of cannabis use and lower energy. COVID SEC also moderated the relation between frequency of cannabis use and depression (b=6.15; 95% CI=1.57-10.74) and anxiety (b=3.02; 95% CI=.38-5.65).
Conclusions: The double hit of greater frequency of cannabis use and COVID-related distress, particularly traumatic stress and fear of the social/economic fallout, amplified internalizing symptoms for college students. Intervention should target both substance use and the context in which it occurs.

T23. White Matter Integrity in Cannabis Using Adolescents and Young Adults and Relations to Age of Regular Use Onset

Alexander Wallace[1], Ryan Sullivan[1], Krista Lisdahl[1]
[1]University of Wisconsin-Milwaukee
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Imaging
Abstract Category Original Research
Aim: Past literature has indicated that cannabis use during adolescents and young adulthood is associated with poor white matter (WM) integrity (Chye, Christensen, & Yucel, 2019). Further, preliminary findings have indicated that age of cannabis onset has been associated with decreased WM integrity. Our study seeks to investigate the relationship between cannabis use and age of regular onset on WM integrity.
Methods: Participants included eighty-three (MJ=39, Controls=49) 16-26-year olds (M=21.2) who were balanced for gender (M=56%). Exclusion criteria included comorbid Axis-I disorders, major medical/neurological disorders, prenatal medical issues, prenatal alcohol/illicit drug exposure, or excessive (>20 times) other lifetime drug use. Past year substance use was measured using the Timeline Followback. Participants were monitored for abstinence over a three-week period leading up to the scan. Diffusion Tensor Imaging (DTI) were completed and processed using Freesurfer TRACULA. A series of linear regressions were run investigating differences between cannabis group on fractional anisotropy (FA) and mean diffusivity (MD) while controlling for past year alcohol use and cotinine levels. Follow-up analyses investigating relationship between age of regular cannabis use onset and significant tracts were completed.

Results: Significantly lower MD was observed in cannabis users compared to controls in the right and left cingulum cingulate gyrus and left uncinate fasciculus. Follow-up analyses in cannabis users demonstrated that earlier age of regular use was associated with increased MD.
Conclusions: Our findings demonstrated better WM integrity in cannabis users compared to controls, which contrasts previous literature. However, follow-up analyses aligned with the existing research in demonstrating that earlier age of regular cannabis use onset was associated with poorer WM integrity. Future analyses should investigate behavioral and cognitive relationships between WM findings to help better ascertain the downstream effects of the brain relationships. Further, longitudinal data is required to disentangle the relationship between cannabis use and WM.

Virtual Poster Q&A Session II: Human

T24. Effects of Extended-Release Naltrexone and Buprenorphine-Naloxone on Pain Outcomes in the X:BOT Trial

Daniel Langleben[*1], An-Li Wang[2], Matisyahu Shulman[3], Tse-Hwei Choo[4], Martina Pavlicova[5], Edward Nunes[3], John Rotrosen[6]*
[1]University of Pennsylvania, [2]Icahn School of Medicine at Mount Sinai, [3]Columbia University and New York State Psychiatric Institute, [4]Columbia University Mailman School of Public Health, [5]Columbia University, [6]NYU Langone School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Pain is highly prevalent among patients with opioid use disorder (OUD) and is associated with poor treatment outcomes. However, little is known about the effects of pharmacological treatments for OUD, e.g. extended-release naltrexone (XR-NTX) and buprenorphine-naloxone (BUP-NX), on pain. We performed a secondary analysis of pain data from the X:BOT trial, a large prospective 24-week, open-label, randomized-controlled comparative effectiveness trial of XR-NTX vs. BUP-NX.
Methods: Participants' current pain status was measured by the question "I have no/moderate/extreme pain or discomfort" in the EuroQol (EQ-5D) instrument. Based on their responses to this question (No vs. Moderate or Extreme) at baseline, participants were dichotomized into "Pain" vs. "No Pain" categories. Participant's pain status was evaluated at weeks 0, 4, 8, 12, 16, 20, and 24. A mixed effects longitudinal logistic regression model was fitted to examine the long-term differential effect of XR-NTX vs. BUP-NX on pain over the full 24-week treatment period, modeling pain at all available follow-up assessments on treatment visit, adjusted for age, sex, and baseline pain.
Results: A total of 474 individuals who were successfully inducted onto their assigned medications (204 [72%] of 283 XR-NTX and 270 [94%] of 287 BUP-NX) were included in this analysis. Among patients who endorsed moderate to severe pain at baseline, while adjusting for the presence of baseline pain (as well as age and sex), a greater proportion of patients endorsed pain in BUP-NX than in XR-NTX groups across the follow up time points (OR = 1.60 [95% CI: 1.07- 2.40], P = 0.023).
Conclusions: Our findings show that pain was less likely to be reported over the 24-week treatment period with XR-NTX than with BUP-NX. Further research is required to determine its clinical relevance.

T25. Identifying Patient Priorities to Improve Substance Use Treatment Outcomes During COVID-19

Alice Dembner[*1], Joseph Sanchez[2], Orla Kennedy[1]*
[1]Community Catalyst, [2]Faces & Voices of Recovery
Abstract Detail Human
Select Drug Category Other, all substances and alcohol
Topic Treatment
Abstract Category Original Research
Aim: As drug overdose deaths continue to rise during COVID, we aimed to improve treatment efficacy by ensuring it focuses on achieving outcomes most important to patients. We explored what patients want from

substance use treatment, hypothesizing a disconnect with what many receive. We also hypothesized a change in patient priorities during COVID.
Methods: A national online survey (convenience sample) of 839 adults from 48 states with lived experience, plus two focus groups. Analyzed using descriptive statistics, with breakdowns by race and gender.
Results: During COVID, patients prioritize these substance use treatment outcomes: staying alive, improving quality of life, and improving mental health. This changed from before COVID, when individuals prioritized stopping all drug/alcohol use. Pre-Covid, there were differences in priority outcomes by race/ethnicity and gender. People identifying as American Indian/Alaska Native, Asian, Black/African American, Hispanic or Latino/Latina/Latinx, Middle Eastern/North African, or Native Hawaiian/Pacific Islander did not prioritize stopping all drug/alcohol use. People identifying as transgender or nonbinary prioritized "address issues that come up in daily life" and "develop a recovery support system" respectively. Additional results, including priorities by race and gender during COVID, available by June.
Conclusions: With drug overdoses rising along with isolation, depression and anxiety during the pandemic, addiction clinicians need to prioritize addressing patient mental health needs, in many cases above or before achieving abstinence. To achieve better outcomes during and after the pandemic, providers and policymakers should assess and ensure services are designed to identify and meet the varied priorities of patients, recognizing priorities can vary by race, gender and other demographics. Further research is needed on best practices to meet patients' desired outcomes, such as improved quality of life. Identifying and centering patient voices is essential.

T26. Assessing Illicit Drug Use in the Follow-up Care of Stroke Survivors

Audrey Cohen[*1], Jooeun Jeong[1], Evelyn Hinojosa[1], Joy Schmitz[1], Mackenzie Spellman[1], Scott Lane[1], Angela Stotts[1], Consuelo Walss-Bass[1], Constanza deDios[1], Sean Savitz[1], Anjail Sharrief[1]*
[1]The University of Texas Health Science Center
Abstract Detail Human
Select Drug Category Other, Multiple
Topic Comorbidities
Abstract Category Original Research
Aim: Illicit drug use (IDU) increases stroke risk and may impact stroke outcomes, yet little is known about follow-up care of stroke survivors with IDU. We sought to determine the frequency of IDU in our outpatient stroke registry and to compare stroke risk factors (RFs) and outcomes in these patients to stroke survivors without illicit drug use.
Methods: Using our outpatient clinical registry (Sept 2014 to Sept 2018), we identified stroke survivors with documented history (past or current) of IDU by questionnaire or clinical notes. We abstracted information on specific illicit substances from inpatient charts. We compared demographic characteristics, post-stroke disability (modified Rankin scale at initial follow-up), and prevalence of stroke RFs between patients with and without IDU.
Results: Of 933 patients, 60 (6.43%) had history of IDU. Reported substances included cocaine (20), amphetamine (3), barbiturates (1), benzodiazepines (4), opioids (12), PCP (1) and marijuana (26). Patients with IDU were younger (median age 52.5 vs 62.0, $p<0.001$) and less likely to be female (23.3% versus 49.8 %, OR=0.31; 95%CI 0.16-0.56). By race, comparing stroke survivors with vs. without IDU, 35.0% vs 39.2% were non-Hispanic white, 38.3% vs 24.3% non-Hispanic black, and 15.0% vs 16.2% Hispanic. There were no differences in post-stroke disability or prevalence of key stroke RFs (hypertension, diabetes, atrial fibrillation) between groups.
Conclusions: Despite being younger, the prevalence of stroke RFs in stroke survivors with IDU was similar to those without IDU. These patients may be at a greater risk for recurrent stroke. Assessment of IDU is a first step toward identifying resources to aid in cessation of IDU for secondary stroke prevention and RF control. Despite limitations, we have identified an opportunity to improve our methods of IDU assessment to optimize preventative care of stroke survivors. This research highlights knowledge gaps that deserve future study.

T27. Community Reinforcement and Family Training (CRAFT) for Substance Use and Psychosis: A Treatment Development Description

Andrea Wood[*1], Roger Weiss, MD[1], Kim Mueser, PhD[2], Robert Meyers, PhD[3], Dost Öngür, MD, PhD[1], Julie McCarthy, PhD[1]*
[1]Harvard Medical School McLean Hospital, [2]Boston University, [3]University of New Mexico
Abstract Detail Human

Select Drug Category Other, Alcohol, Cannabis, and/or Nicotine
Topic Treatment
Abstract Category Program Descriptions
Aim: This study is designed to develop and evaluate the feasibility of a telemedicine protocol for Community Reinforcement and Family Training (CRAFT) to improve treatment engagement and reduce distress among families of individuals diagnosed with early psychosis (EP) and co-occurring substance use.
Methods (Optional): Participants are families and patients in a EP program in MA. Families complete the intervention, which consists of six to eight ~60-minute coaching sessions of CRAFT modified for psychosis and delivered via telemedicine (CRAFT-PT) by a study therapist. Participants complete an assessment battery four times: pre-treatment, mid-treatment, post-treatment, and a three-month follow-up. Families also complete a survey following each session to rate their satisfaction with treatment (helpfulness and convenience). Intervention topics include building motivation and self-care, communication, functional analysis of substance use, positive reinforcement of healthy behaviors, allowing for negative consequences, and discussing treatment. The program aims to increase patients' readiness to change their substance use, decrease families' depression and anxiety, and improve the patient-family relationship. After 10 families complete the program, we will use qualitative data from a focus group of families in addition to session feedback, participation, and retention data to guide further treatment development and we will test the revised manual with 10 new families. The percentage of participants who complete the program, percentage of session attendance, and mean treatment satisfaction ratings will be used to evaluate the feasibility and acceptability of the intervention.
Results (Optional): As of November 11, 2020, family members were all mothers who had 100% session attendance, and they rated treatment satisfaction across sessions as being near excellent (mean(SD) = 4.88(0.29)) despite experiencing technical difficulties in ~38% of sessions.
Conclusions: Preliminary data suggest that the CRAFT-PT protocol is feasible and acceptable to serve as the active treatment in a pilot randomized controlled trial comparing CRAFT-PT to treatment as usual.

T28. An Observational Cohort Study Examining Predictors of Treatment Completion Among People Accessing Residential Treatment for Substance Use Disorders in New South Wales, Australia

Briony Larance[*1], Carol Keane[2], Laura Robinson[1], Suzie Hudson[3], Frank Deane[1], Emma Hatton[1], Esther Davis[1], Peter Kelly[1]*
[1]University of Wollongong, [2]University of Central Queensland, [3]Network of Alcohol and Other Drug Agencies, NSW

Abstract Detail Human
Select Drug Category Other, Substance use disorders (alcohol, opioids, cannabis, amphetamines)
Topic Treatment
Abstract Category Original Research
Aim: Residential alcohol and other drug (AOD) treatment services in New South Wales, Australia, differ widely in program duration and the time to achieve 'treatment completion' (i.e., planned treatment exit). This study describes residential treatment episode length by gender and primary substance of concern and examines predictors of time to 'treatment completion'.
Methods: Observational cohort study of N=2,707 clients attending residential treatment in NADABase-participating services between 2010 to 2019 where the primary substance of concern was alcohol, opioids, amphetamines or cannabis. Measures include demographics (age, gender, housing, employment); clinical characteristics (primary substance, dependence, distress, quality of life); length of treatment episode; and time to treatment completion.
Results: People who ceased treatment in the first 90 days were more likely to have left due to reasons other than 'treatment completion'; those who stayed longer were more likely to leave due to 'treatment completion'. Shorter time to 'treatment completion' was associated with being older and having employment at entry. Longer time to 'treatment completion' was associated with not having secure housing and reporting opioids as primary substance of concern (vs. alcohol). Baseline severity of dependence, psychological distress or quality of life were not associated with time to 'treatment completion'.
Conclusions: Achieving 'treatment completion' was associated with longer treatment episodes. Time to achieve 'treatment completion' was associated with employment and the need for secure housing but not with the severity

of clinical profile at baseline. Residential programs typically focus on psychological needs, but these findings highlight the importance of broader educational, vocational, living skills and housing supports.

T29. COVID-19 Knowledge, Testing, Risk Behaviors, and Vaccine Trust Among Clients in Residential Addiction Treatment

Sania Elahi[1], Maggie Chen[1], Caravella McCuistian[1], Elana Straus[1], Valerie Gruber[1], Carmen Masson[1]*
[1]University of California - San Francisco

Abstract Detail Human
Select Drug Category Other, Treatment
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research

Aim: Individuals with a substance use disorder (SUD) are at a significantly higher risk for coronavirus disease-19 (COVID-19) and have higher rates of COVID-19 related hospitalization and death than those without SUD. This study assesses the knowledge, testing, risk behaviors, and vaccine trust of clients in SUD treatment programs in regard to COVID-19.
Methods: Women and men (N = 160) enrolled in seven residential addiction treatment programs in California completed surveys between June and August 2020.
Results: Participants were predominantly male (88%) and racially/ethnically diverse (36.3% Non-Hispanic White) with a mean age of 37.4 years (SD = 11.4). The majority of participants were current smokers (67.5%) and most had not changed their smoking patterns (65.4%) due to COVID-19. Participants were knowledgeable about COVID-19 transmission; with 96% believing close contact with a symptomatic infected person can transmit coronavirus, 94.1% believing close contact with an asymptomatic infected person can transmit coronavirus, and 93.2% believing that contact with surfaces an infected person has touched can transmit coronavirus. In the full sample, 60.4% had ever been tested for the novel coronavirus in the past 30 days, 62.3% wore a protective mask all the time in the past 30 days, while 32.9% did not trust at all that a coronavirus vaccine would be safe and effective. Among current smokers (n = 108), 51% reported sharing the same cigarette or e-cigarette with someone else in the past month.
Conclusions: Clients enrolled in residential SUD treatment were knowledgeable about COVID-19 transmission; however, almost a third did not trust that a COVID-19 vaccine would be safe and effective. COVID-19 vaccine messaging and risk communication should be disseminated to people with SUD through trusted sources and tailored to address specific risk behaviors such as sharing cigarettes/e-cigarettes.

T30. Epidemiology of Kratom (Mitragyna Speciosa) Use Among Adults in the United States: Analyses of the 2019 National Survey on Drug Use and Health

Catalina Lopez-Quintero[1], Alyssa Falise[1], Sean Taylor[1], Vinita Sharma[1], Carolin Hoeflich[1], Catherine Striley[1]*
[1]University of Florida

Abstract Detail Human
Select Drug Category Other, Kratom (Mitragyna speciosa)
Topic Epidemiology
Abstract Category Original Research

Aim: Kratom (Mitragyna speciosa) leaves can produce stimulant, analgesic, and opioid-like effects. It contains mu-opioid partial agonists, and undergoing studies investigate its potential for reducing opioid withdrawal symptoms. Although kratom is not currently scheduled by the Drug Enforcement Agency, data from the Non-Medical Use of Prescription Drugs Program and the National Poison Data System suggest kratom can be abused and lead to critical health problems. This study aims to determine the prevalence and correlates of kratom use among a nationally representative sample of U.S. adults.
Methods: We analyzed data from 42,179 individuals aged 18+ who participated in the 2019 National Survey on Drug Use and Health. Descriptive analyses and multivariable logistic regression models were conducted to estimate lifetime, past 12-month, and past 30-day prevalence rates and identify correlates of kratom use. Estimates account for the survey's complex sampling design.
Results: The lifetime, past 12-month and 30-day prevalence rates of kratom use were 1.6% (95%C.I.=1.5, 1.7), 0.8% (95%C.I.=0.7, 0.9) and 0.3% (95%C.I.=0.2, 0.4), respectively. Past 12-month history of a DSM-IV prescription pain relievers use disorder was the strongest correlate of lifetime (aOR=5.7, 95%C.I.=2.7, 12.2), past 12-month (aOR=4.1, 95%C.I.=1.8, 9.1) and past 30-day (aOR=4.2, 95%C.I.=1.4, 13.1) use. Non-Hispanic Blacks

were less likely (aOR=0.4, 95%C.I.=0.1, 0.9) than Non-Hispanic Whites to use kratom in the past 30 days. Other drug use correlates of kratom use in the past 30 days include a past 12-month history of nicotine dependence (aOR=2.2, 95%C.I.=1.2, 4.1), cannabis use disorder (aOR=3.8, 95%C.I.=1.6, 9.0), and stimulants use disorder (aOR=4.4, 95%C.I.=1.2, 15.9).
Conclusions: Based on our estimates, approximately two million US adults used kratom in the 12 months preceding the survey. The strong association between history of a past 12-month prescription pain relievers use disorder and kratom use highlights the need to investigate the use of kratom as a medical resource to reduce opioid withdrawal symptoms.

T31. Development of an Informed Text-Message Library and Telephone Health Coaching Intervention for Diverse Community Health Center Patients Who Use Drugs in Los Angeles

Dallas Swendeman[1], Stephanie Sumstine[1], Zachary Jacobs[1], Efren Aguilar[1], Whitney Akabike[1], Lillian Gelberg[1]*
[1]*University of California Los Angeles*
Abstract Detail Human
Select Drug Category Other, Risky Drug Use
Topic Prevention
Abstract Category Original Research
Aim: The aim of this analysis was to identify barriers and facilitators to drug use reduction to inform development of content for theory-based automated feedback text-messages, sent in response to weekly self-monitoring surveys, and to inform telephone health coaching for patients with moderate risk drug use (ASSIST score 4-26; ASAM 0.5) in the new NIDA-funded QUIT-Mobile study.
Methods: Two researchers conducted thematic content analysis of the health educator coaching log data from the original Quit Using Drugs Intervention Trial (QUIT) and the subsequent Binational QUIT (LA and Mexico). Common themes were identified through iterative rounds of coding and discussion with the study team.
Results: The most commonly cited barriers to reducing or stopping drug use were relaxation and increased QoL; works better than prescribed medication; pain relief; sleep; peers/social environment. Feedback messages were developed for the most commonly cited facilitators for drug use reduction, which overlapped with barriers, and all codes were collapsed into general “domains” patients would have the opportunity to opt-in to (ex. Health, Activities, Social, Lifestyle, Positive Future Orientation, and Services). Each code was also assigned as a “Motivator” or “Technique/Strategy” to support patients in maintaining their drug use reduction goals. Messages were developed based on Social Cognitive Theory, Health Belief Model, and Social Support Theory and aimed to provide tailored feedback messages with affirmations, motivational text messages, and drug use reduction technique tips. Messages were also drawn and adapted from text-message libraries used in prior studies to reduce substance use in diverse communities [Project Tech Support (Reback); ATN studies (Swendeman)].
Conclusions: Results from qualitative data analysis suggest there are unique barriers and facilitators to drug use reduction in diverse low-income primary care patients. Feedback messages in interventions utilizing mobile self-monitoring should be tailored to individuals’ noted barriers and facilitators to enhance motivation and reinforce alternatives to drug use.

T32. Development of the Family Assessment, Motivation, and Linkage (FAMLI) Intervention

Jennifer Becan[1], Elizabeth Joseph[1], Shatoya Young[1], Rachel Crawley[1], Danica Knight[1]*
[1]*Texas Christian University*
Abstract Detail Human
Select Drug Category Other, substance use
Topic Substance Use Disorder
Abstract Category Program Descriptions
Aim: Among youth who are under community supervision through Juvenile Justice (JJ) agencies, most are involved in substance use (SU) and have an identified need for SU treatment. However, the rate at which those who need treatment while on probation and who initiate SU treatment services is markedly lower than the initiation rate in the general adolescent population. Lack of family engagement due to low motivation (associated with resistance, denial, lack of information) and logistical challenges (lack of knowledge of options, funding, and transportation) are significant barriers to service engagement.

The goal of this project is to improve the way that youth and families prepare for change and assist them in overcoming challenges that sometimes make participating in services outside the JJ system difficult. Thus, a caregiver-youth intervention was developed as informed from focus group data to target motivation for change (for example, how to recognize and overcome a problem) and logistical challenges (for example, how to find help when you need it). Because families may experience one or both of these barriers, developing a customizable, adaptive approach designed to assess and address them is important.
The intervention has two primary components: (1) a family engagement assessment that is designed to help JJ staff identify youth whose families are less likely to participate actively in supporting conditions of supervision (including SU treatment), and (2) bundling of well-established clinical approaches known to be effective for improving motivation to change, linkage to services, and/or treatment engagement.
Conclusions: This presentation will illustrate how an in-person group-based intervention can be adapted as a virtual-based dyadic intervention approach for JJ youth and caregivers. There will also be discussion of early JJ staff attitudes toward intervention feasibility, acceptability, and optimal configuration of the dyadic intervention components for promoting treatment initiation among youth involved in the JJ system.

T33. Emergency Department Visits by Opioid Agonist Treatment Patients During the COVID-19 Pandemic

Jessica Stovel[*1], Beth Sproule[1]*
[1]Centre for Addiction and Mental Health
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Opioid agonist treatment (OAT) is the most effective therapy for opioid use disorder (OUD). During the COVID-19 pandemic social distancing and self-isolation requirements may present challenges in OAT service delivery. In the province of Ontario, OAT management guidance was modified to facilitate OAT access. To help understand the challenges faced by OAT patients during the pandemic, this study is examining admissions to the emergency department of the Centre for Addiction and Mental Health in Toronto (CAMH ED).
Methods: The electronic health records for people with OUD visiting the CAMH ED from March-October 2020 are being reviewed to extract visit reasons, opioid use disorder treatment needs, comorbidities and pandemic impacts.
Results: Preliminary results for 50 OUD patients (64% male, mean age 35.4±9.8 years) who visited the ED between March-June 2020 are available. Most (n=38, 76%) were currently prescribed OAT (52% methadone, 24% buprenorphine) and the most common visit reasons were related to mental health problems (e.g., suicidal ideation - 10/38, 26%), and treatment seeking for ongoing opioid use (e.g., 13/38, 34%). Most patients had complex clinical needs with multiple comorbidities. Of note, 12 patients with OUD (24%) who visited the ED had not been prescribed OAT and all were initiated on buprenorphine while at CAMH. Only 2 patients had documented changes to OAT therapy due to the pandemic (increased take-home doses). No patients had documented COVID-19 illness.
Conclusions: Preliminary results indicate that changes or challenges related to OAT during the pandemic were not highly prevalent in OUD patients seeking treatment at the CAMH ED. However, from the clinical documentation it was not possible to determine the contribution of the pandemic to the complex clinical situations of these OUD patients, involving multiple mental health and addiction problems.

T34. The Moderation of Homelessness and Mental Health on SAVA Population Syndemic Outcomes in the WORTH Intervention

Karen Johnson[*1], Kiranpreet Sekhon[1], Timothy Hunt[2], Lisa Puglisi[3], Johanna Elumn[3], Amali Epa-Llop[1], Emily Wang[3], Nabila El-Bassel[2], Louisa Gilbert[2], Hannah Bonbrest[1], Zainab Shah[1], Ben Chapman[1], Diane Morse[1]*
[1]University of Rochester School of Medicine, [2]Columbia University School of Social Work, [3]Yale University School of Medicine
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Criminal Justice
Abstract Category Original Research

Aim: The Women on the Road to Health (WORTH) Transitions intervention is designed to increase uptake of substance use and mental health treatment services and reduce HIV/HIV risk behaviors and substance misuse among recently incarcerated women.
Methods: We recruited drug-using women from jails, prisons, shelters, and other community sites in Rochester, NY (n=110) and New Haven, CT (n=98). Participants had HIV, Hepatitis C (HCV), and sexually transmitted infection (STI) risks; trauma; and incarceration-related disruptions in care. Using screening+baseline ("baseline"), and 6-month follow-up data, we explored WORTH intervention impacts on SAVA syndemic variables (substance abuse + intimate partner violence leading to HIV/HIV risks) and potential moderation by recent homelessness and mental health symptoms (depression and PTSD). We also examined whether women with high levels of SAVA, mental health, and homelessness risks at baseline would have significantly higher HIV/HCV/STIs and HIV/HCV/STI risk behaviors at follow-up.
Results: Baseline trauma impacted 53% of participants and remained unchanged at follow up. Substance misuse and depression symptoms decreased at follow-up. Participants experienced baseline homelessness at 31%. Homelessness was associated with outcomes of a 29% probability of reduction in HIV/HCV/STI risk behaviors, compared to 11% reduction for nonhomelessness ($p<.05$).
Conclusions: Results inform the need for interventions such as WORTH Transitions designed for the population of women recently released from incarceration to address HIV/HCV/STIs, the SAVA syndemic, and co-occurring risk factors (homelessness and mental health symptoms). Jail and prison re-entry staff and community funders should consider programs such as WORTH for high-need populations with needs not fully addressed by current mechanisms.

T35. Political Partisanship and Stigma Against People Who Use Drugs in Opinions About Allocating COVID-19 Prevention Resources to Vulnerable Populations

Kristin Schneider[*1], Deborah Wilson[2], Lauren Dayton[1], Erin Anderson Goodell[1], Carl Latkin[1]*
[1]Johns Hopkins Bloomberg School of Public Health, [2]Johns Hopkins School of Nursing
Abstract Detail Human
Select Drug Category Other, people who use drugs
Topic Other
Abstract Category Original Research
Aim: The distribution of resources during the COVID-19 pandemic has been politicized and contentious in the United States. Vulnerable populations, such as those living in poverty, experiencing homelessness, or who use drugs, are particularly susceptible to becoming infected with COVID-19 and often have limited access to protective supplies, such as masks and hand sanitizer. Our aim was to understand public opinion on increasing the allocation of COVID-19 prevention resources to vulnerable populations.
Methods: Data were from an online survey of 680 United States adults. Participants' opinions on the allocation of COVID-19 prevention resources to people with low income, experiencing homelessness, or who use drugs were assessed using a five-item Likert scale. We examined the prevalence of these opinions and their relationship to sociodemographic characteristics, COVID-19 beliefs, and drug-related experiences.
Results: Most participants supported increasing resources for individuals with low incomes (79.56%) and experiencing homelessness (74.6%), while a minority supported increasing resources for people who use drugs (33.5%). Politically conservative participants were less likely to support increasing resources for all three populations than those who were politically liberal. Skepticism about the severity of COVID-19 was also associated with less support for increasing resources across groups.
Conclusions: Our results demonstrate that people who use drugs continue to be stigmatized in the context of the COVID-19 pandemic, resulting in popular opinion not supporting people who use drugs with potentially lifesaving resources. Overcoming this stigma is essential to prevent COVID-19 among people who use drugs, a population which experiences elevated risk of COVID-19 infection.

T36. Religiosity and Substance Use in the Adults U.S. General Population: Findings From a Large-Scale National Survey

Ofir Livne[*1], Daniel Feingold[2], Dvora Shmulewitz[3], Deborah Hasin[1], Shaul Lev-Ran[4]*
[1]Columbia University Mailman School of Public Health, [2]Ariel University, Israel, [3]New York State Psychiatric Institute, [4]Tel Aviv University, Israel
Abstract Detail Human

Select Drug Category Other, Alcohol, Tobacco, and cannabis use
Topic Epidemiology
Abstract Category Original Research
Aim: While religiosity has been shown to be inversely associated with alcohol and drug use, past studies had numerous limitations, e.g., limited range of substances investigated and lack of control for potential confounders. Considering the ongoing increase in religious disaffiliation in the US, and the high prevalence of substance use, a large-scale report on these associations in the general population is warranted. Our aim was to evaluate associations between religiosity domains, substance use and substance use disorders (SUD) among US adults, while accounting for various confounders.
Methods: Participants ≥18 years were interviewed in the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III) in 2012-2013. Among the entire NESARC-III sample (N=36,309), we examined associations between four religiosity domains (importance of religiosity/spirituality, service attendance, religious social-interaction, and religious affiliation), substance use and DSM-5 SUD. Several logistic regression models and sensitivity analyses determined these associations, while controlling for potential confounders, including sociodemographic characteristics, clinical correlates, non-religious social support measures, and other religiosity domains.
Results: Among all religiosity domains, only frequency of service attendance was inversely associated with most substance use outcomes. Those with frequent religious service attendance had lower odds of alcohol use disorder (odds ratio[OR]=0.4, 95% CI 0.25-0.49), tobacco use disorder (OR=0.3, 95% CI 0.22-0.36) and cannabis use disorder (OR=0.1, 95% CI 0.04-0.28), compared to others. Importance of religiosity/spirituality was inversely associated with alcohol use (OR=0.7, 95% CI 0.59-0.79), cannabis use (OR=0.8, 95% CI 0.66-0.95), and alcohol use disorder (OR=0.8, 95% CI 0.75-0.96), although to a substantially lesser degree than service attendance.
Conclusions: This study provides findings from a nationally representative large-scale study on the associations between religiosity domains and substance use among US adults. Results demonstrate that in US adults, among religiosity domains, frequency of service attendance holds a robust and independent protective role against substance use and SUDs across an array of substances.

T37. Treatment Initiation and the Social Determinants of Health in Persons Living With HIV Seeking Medication for Opioid Use Disorder

Pamela Vergara[*1], Erin Jaworski[1], Ryan Cook[2], Kim Hoffman[2], Elizabeth Waddell[2], P. Todd Korthuis[2]*
[1]Ruth M Rothstein CORE Center, [2]Oregon Health & Science University

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: To understand the influence of the social determinants of health (SDOH) on medication for opioid use disorder (MOUD) initiation among adults living with uncontrolled HIV and seeking HIV and OUD treatment.
Methods: From March 2018 to April 2019, 114 persons with uncontrolled HIV and opioid use disorder (OUD) were enrolled and randomized to receive extended-release naltrexone or treatment as usual (buprenorphine or methadone). Data were collected over six months through participant surveys and medical records. SDOH at baseline included: education (high school or more), current economic stability (employment or disability income), housing stability (no homelessness in past 6 months), no criminal justice involvement (no arrest, incarceration, probation or parole in past 3 months), and substance use disorder treatment in past 28 days. SDOH were examined individually and cumulatively as predictors of MOUD initiation, defined as receipt of first XR-NTX injection or TAU prescription. Relationships between SDOH and initiation of MOUD were analyzed with Cox proportional hazards models controlling for demographics, baseline pain score, psychiatric conditions, severity of OUD, and treatment arm.
Results: Out of the 114 participants, 81 initiated MOUD. Study participants reported an average of 2.3 SDOH supports out of the five assessed. Each additional SDOH was associated with a 19% increase in the likelihood of MOUD initiation [adjusted HR = 1.19 95% CI = (1.01, 1.41), p = .036]. Recent substance use disorder care was the only individual SDOH associated with MOUD initiation [aHR = 2.98, 95% CI = (1.69, 5.25), p<.001].
Conclusions: The cumulative number of SDOH increased the likelihood of MOUD initiation in persons living with HIV with OUD. History of SUD treatment at baseline is an important indicator of access to services that may increase MOUD initiation in this vulnerable population.

T38. Conceptual Confusion Regarding Prescription Drug Misuse, Abuse, and Non-Medical Use is Negatively Impacting Patient Care

Eric Parmon[*1], John Roache[2]*
[1]University of Texas Health Science Center at San Antonio, [2]University of Texas Health - San Antonio
Abstract Detail Human
Select Drug Category Other, scheduled prescription drugs
Topic Treatment
Abstract Category Literature Review
Aim: We conducted a critical review of the literature regarding problems in prescription drug use that are variously described as “misuse”, “abuse”, “non-medical use”, “aberrant use”, to illustrate 1) confusion in terminology and concepts, and 2) how this confusion negatively impacts treatment.
Results (Optional): Major epidemiological surveys like Monitoring the Future indicate that the population of people who engage in problematic prescription drug use is heterogeneous, with distinct subgroups and only a small subpopulation meeting criteria for a DSM-5 substance use disorder (SUD). However, major epidemiological surveys and many investigators use varying definitions for terminology distinguishing use, misuse, non-medical use, abuse, etc. These terms are also commonly used as vague, catch-all language describing behaviors associated with SUDs. As a consequence, systematic reviews and treatment guidelines have not adequately differentiated between patients who have a SUD vs. those exhibiting other problems related to prescription drug use such as overuse, non-compliance, drug-seeking, semi-therapeutic self-medication, etc. This terminology confusion also produces gaps in the literature regarding how best to manage different problematic behaviors with a resultant assumption that standard SUD treatment is indicated.
Conclusions: Confusion in terminology and failure to study different behavioral aspects of problematic use of prescription drugs have led to unvalidated assumptions that the SUD framework and treatment models adequately address these problems. Treatment guidelines overly rely on controlling patient behaviors through enhanced monitoring (e.g., Prescription Drug Monitoring Programs) and by forcibly tapering medications when problematic prescription drug use is suspected. Stigma associated with the SUD labels, and the inappropriateness of a standard SUD treatment marginalizes these patient populations and produces barriers to care while failing to address the needs of individual patients. We suggest the need for more patient-centered, harm-reduction approaches to care.

T39. Providing MOUD in Jail and Prison Prevents Overdose Deaths

Rosemarie Martin[*1], Augustine Kang[1], Ryan Carpenter[1], Nicole Alexander-Scott[2], Linda Hurley[3], Jennifer Clarke[2]*
[1]Brown University School of Public Health, [2]Rhode Island Department of Health, [3]Codac Behavioral Healthcare Inc
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: In 2016, the Rhode Island Department of Corrections (RIDOC) became the first statewide US correctional system to provide comprehensive medication for opioid use disorder (MOUD). This study examines the association of the program with overall overdose fatalities and deaths from overdose among those individuals who were recently incarcerated.
Methods: The RIDOC comprehensive MOUD program includes (1) screening all individuals for OUD; (2) continuing and initiating individuals on MOUD while incarcerated; (3) offering all FDA-approved MOUDs as appropriate; and (4) linking individuals to MOUD in the community at release. We conducted a retrospective cohort analysis of overdose deaths in the 30 months prior to implementation of the RIDOC comprehensive MOUD program on July 1, 2016 compared to the 30 months after implementation. Data from the State Medical Examiner Office for all unintentional overdose deaths from January 1, 2014 to December 31, 2018, were linked to release data from RIDOC. RIDOC decedents were defined as death within 12 months of release from RIDOC. Chi-square analysis compared the proportion of decedents who were recently incarcerated from January 1, 2014 to June 30, 2016 with those who were incarcerated from July 1, 2016 to December 31, 2019.
Results: There were 709 overdose deaths from January 1, 2014 to June 30, 2016, compared with 794 overdose deaths from July 1, 2016 to December 31, 2019, an overall increase of 26%. Among deaths in the first period, 129

of 709 (18%) were recently incarcerated compared to 87 of 794 (11%) in the second period, representing a 76% relative mortality risk reduction (chi-square=11.97, p<.001) among recently incarcerated.
Conclusions: A statewide comprehensive MOUD program was associated with a significant reduction in overdose mortality among justice-involved persons. Reducing overdose risk requires promotion of such evidence-based approaches in this setting.

T40. Predicting Past-Year Healthcare Engagement Among Young Men Who Have Sex With Men (YMSM) Using Andersen's Model of Healthcare Utilization

Sabina Hirshfield[*1], Simon Sandh[2], Jose Diaz[3], Rebecca Schnall[3], Robert Garofalo[4], Lisa Kuhns[4], Cynthia Pearson[5], Josh Bruce[6], D. Scott Batey[7], Asa Radix[8], Uri Belkind[8], Marco Hidalgo[9]*
[1]SUNY Downstate Medical Center, [2]New York University, [3]Columbia University, [4]Lurie Children's Hospital of Chicago, [5]University of Washington, [6]Birmingham AIDS Outreach, [7]University of Alabama at Birmingham, [8]Callen-Lorde Community Health Center, [9]University of Southern California
Abstract Detail Human
Select Drug Category Alcohol
Topic Health Services
Abstract Category Original Research
Aim: To understand factors associated with healthcare utilization among diverse young men who have sex with men (YMSM) using Andersen's behavioral model.
Methods: From 2018- 2020, 751 YMSM (aged 13-18) recruited online and offline for the MyPEEPS mHealth HIV prevention study completed an online survey. We assessed associations between past-year checkup (i.e., healthcare utilization) and predisposing factors (parental education, race/ethnicity, age, internalized homonegativity), enabling factors (healthcare access literacy, healthcare facility type, US Census Divisions [1-9]), need-based factors (ever testing for HIV) and past-year alcohol use with hierarchical logistic regression.
Results: Median age was 16; 32% were Hispanic, 24% White, 15% Black, 13% Multiracial, 9% Asian, 7% American Indian/Alaska Native/Native Hawaiian/Other Pacific Islander; 52% reported past-year alcohol use; and 74% reported a past-year checkup.
In the final regression model, increased odds of a past-year checkup were found for younger age (age 13-14 AOR:1.83; 95%CI:1.02-3.30; age 15-16 AOR:1.51; 95%CI:1.01-2.25; reference=17-18), higher parental education (AOR:1.82; 95%CI:1.22-2.71), higher healthcare access literacy (AOR:1.71; 95%CI:1.35-2.15), with similar patterns found for internalized homonegativity, US Census Division, and ever testing for HIV. Multiracial YMSM had decreased odds of reporting a past-year checkup (AOR:0.50; 95%CI:0.27-0.91; reference=White), as did YMSM who received one-off care at their last visit (AOR:0.66; 95%CI:0.45-0.96; reference=Private doctor, hospital clinic, or CBO). Past-year alcohol use was not significantly associated with past-year checkup.
Conclusions: In this diverse sample of US YMSM, predisposing, enabling, and need-based factors were associated with past-year healthcare utilization. MSM <17 were more likely to be engaged in care, which signals a unique opportunity to intervene early in YMSM's health risk trajectory. Additionally, interventions that remove barriers to private or other continuous care for YMSM may improve healthcare utilization.

T41. The 2020 CPDD Membership Survey: A New Approach to Assessing Diversity and Inclusion in Scientific Organizations

Sherecce Fields[*1], Jack Henningfield[2], Timothy Regan[1], Virmarie Correa-Fernandez[3], Marcel de Dios[3], Albert Garcia-Romeu[4], Angela Heads[5], Caitlyn Hood[6], Thomas Hudzik[7], Angela Moreland[8], Anne Skinstad[9]*
[1]Texas A&M University, [2]Pinney Associates, Inc., [3]University of Houston, [4]Johns Hopkins University School of Medicine, [5]University of Texas Health Science Center, [6]University of Kentucky, [7]BlueRock Therapeutics, [8]Medical University of South Carolina, [9]University of Iowa
Abstract Detail Human
Select Drug Category Other, None
Topic Other
Abstract Category Original Research
Aim: Advancing equity, inclusion and diversity is vital to increase innovation and the excellence of science as well at its relevance to societal and public health needs. This survey was developed to support and accelerate such efforts with a more flexible approach to characterize diversity and measure of inclusion.

Methods: With input from diversity experts of the National Institutes of Health, CPDD and other organizations, a new survey approach was developed for trial launch in July 2020 to all CPDD members by Internet. The survey used an expanded range of options related to ancestry/ethnicity/race, gender identity, and sexual orientation. It included the following option in each category: "None of these describe me. I describe myself as __".
The survey was voluntary and included a request for comments for revision of the survey approach.
Results: 60% (657 out of 1100 members) completed the survey. Most self-identified along the lines of conventional surveys employing 6 ethnicity/race, and as either male or female. However, many chose a variety of other options related to their Hispanic ethnicities (13.8%), non-White identification (24.4%), nonbinary and/or transgender identities (1.2%). A substantial portion of minority members provided their own preferences for self-identification. Responses to the inclusion proxy ("How welcome do you feel at CPDD?") suggest an association with some demographic factors, such as ancestry and sexual orientation.
Conclusions: This survey indicates that conventional ethnicity/race and binary sexual identification option surveys fall short of characterizing the full diversity of CPDD and probably most other scientific organizations. Although meeting diversity data are limited, this survey suggests that the membership is less diverse than meeting attendees and reinforces the need to survey both. Comments suggest that the expanded options approach more fully characterizes diversity and is appreciated. It may contribute to inclusion as well as provide insights to accelerate inclusion and diversity progress.

T42. Development of a Screening Tool to Identify Prep-Eligible Youth in Primary Care

Scott Hadland[*1], Natalie LaBossier[1], Angela Bazzi[2], Kimberly Nelson[2], Eugene Massey[2], Julia Potter[1]*
[1]Boston University School of Medicine, [2]Boston University School of Public Health

Abstract Detail Human
Select Drug Category Other, HIV
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Literature Review
Aim: Youth aged 15-24 account for 1 in 5 new human immunodeficiency virus (HIV) infections in the US. Despite national recommendations that youth at risk for HIV receive preexposure prophylaxis (PrEP), only 1 in 9 youth eligible for PrEP receives it. We aimed to develop a PrEP eligibility screening tool for use in pediatric primary care among youth in order to detect substance use and sexual risk factors for HIV.
Methods (Optional): To systematically develop a PrEP eligibility screening tool, we reviewed US-based PrEP clinical guidelines for adults ≥18 and adolescents <18 to compile a list of eligibility criteria, including substance use and sexual risks for HIV. We developed medical database search terms and, using Google Scholar, collected probes from validation studies of screening tools. We also identified relevant probes from national surveys, including Monitoring the Future, Youth Risk Behavior Surveillance Survey, Behavioral Risk Factor Surveillance System, National HIV Behavior Surveillance, and National Survey on Drug Use and Health. We eliminated redundant questions, simplified responses into binary choices where possible, prioritized questions that had been validated among youth, and arranged questions into a single electronic screening tool using branch logic to minimize the length.
Results (Optional): We identified 5 'definite' PrEP eligibility criteria (shared use of drug-injecting equipment, condomless anal sex, HIV-serodiscordant sex partner, condomless sex with a partner with unknown HIV status, history of sexually transmitted infection) and 6 'probable' criteria (sex after use of drugs or alcohol, hepatitis C diagnosis, number of sexual partners, multiple sexual partners within the same time period, sex work, prior use of postexposure prophylaxis). We identified 41 potential questions covering all 5 definite and 6 probable PrEP criteria. After eliminating redundant questions and prioritizing youth-validated items, we finalized a 23-item questionnaire. Based on branch logic, a single respondent would answer ≤16 questions (and as few as 4 if not using substances or having sex).
Conclusions: Previously validated screening questions pertaining to sexual and substance use-related HIV risk can be compiled into a single screening tool to identify PrEP-eligible youth. Next steps in this line of research will be to solicit qualitative feedback on probes and responses from youth and providers, conduct cognitive interviews with youth, and perform a validation study.

T43. Specialty Substance Use Treatment Programs for People Living With HIV in Puerto Rico Following Hurricane Maria

Sarah Gutkind[*1], Pia Mauro[1]*

[1]*Columbia University*
Abstract Detail Human
Select Drug Category Other, Substance Use (general)
Topic Health Services
Abstract Category Original Research
Aim: Puerto Rico (PR) has one of the highest rates of HIV transmission in the US. In 2018 there were approximately 49,500 HIV infections in PR, 48% of which were linked to substance use. Following Hurricane Maria in 2017, viral suppression among people living with HIV (PLWH) with a history of substance use decreased. In this study, we compared substance use program availability for PLWH in states affected by Hurricanes Maria (i.e., PR, FL) and Harvey (i.e., LA, TX) to that of non-affected states to understand changes in HIV-related morbidity that may have attributable to Hurricane Maria.
Methods: Data from the 2014, 2016 and 2018 National Survey of Substance Abuse Treatment Services described whether facilities included special treatment programs for PLWH. A 2018-year indicator identified post-hurricane exposure. We used mixed-effect logistic regressions to estimate odds of specialty programs for PLWH, adjusted for state-level and facility-level covariates, and model-based predicted marginal probabilities to estimate changes in prevalence of services provided.
Results: After Hurricane Maria, the number of treatment facilities reporting special programs for PLWH in PR was 14% lower in 2018 than 2014 (i.e., 108 vs. 123) and 7% lower than 2016 while remaining stable or increasing in other hurricane-affected or non-affected states. Among participating treatment facilities in PR, there were no changes in payment structures, inpatient, and outpatient services. Treatment facilities in PR had 36.7% lower odds of offering special programs for PLWH in 2018 than 2014 (aOR=0.63, CI=0.37-1.09) and 28% lower odds than 2016 (aOR=0.72, CI=0.42-1.23), and remained stable in Hurricane Harvey-affected states.
Conclusions: The reduction in substance use services for PLWH following Hurricane Maria in PR was not observed in other hurricane-affected states. Changes in service provisions could have contributed to HIV-related morbidity. These findings highlight the need to focus on building treatment capacity in PR, particularly for marginalized populations.

T44. Kratom Use Among U.S. Adolescents: Analyses of the 2019 National Survey on Drug Use and Health

Vinita Sharma[*1], Linda Cottler[1], Cristina Bares[2], Catalina Lopez-Quintero[1]*
[1]*University of Florida*, [2]*University of Michigan*
Abstract Detail Human
Select Drug Category Other, Botanical
Topic Lifespan (Infant, Adolescent, Aging)
Abstract Category Original Research
Aim: Kratom (Mitragyna speciose) is an analgesic opioid-like psychoactive substance, not approved by FDA. It is easy to use (in form of capsules, pills, extract or leaves), can be purchased via the Internet, is promoted as source of “legal high” and is increasingly used by middle-aged people in their home environments - all of which facilitate use among adolescents. This study aims to determine the prevalence and correlates of lifetime and past 12 months of kratom use among a nationally representative sample of U.S. adolescents.
Methods: We analyzed data from 13,397 individuals aged 12-17 years who participated in the 2019 National Survey on Drug Use and Health (NSDUH). Socio-demographic and drug-use correlates were identified using multivariable logistic regression. Prevalence and odds ratio estimates account for the survey’s complex sampling design.
Results: The lifetime and past 12-month use prevalence rates of kratom use were 0.44% (95%C.I.=0.32, 0.60) and 0.27% (95%C.I.=0.18, 0.40) respectively. The strongest correlate of lifetime use (aOR=2.55, 95%C.I.=1.49, 4.38) and past 12-month use (aOR=2.98, 95%C.I.=1.45, 6.12) was marijuana use within the past year. Compared with adolescents whose families had the highest income, those with family incomes in the middle range were more likely (aOR=2.76, 95%C.I.=1.06, 7.16) to use kratom in the lifetime. There were no significant differences between other racial/ethnic groups, except that compared to Non-Hispanic Whites, Non-Hispanic Others were less likely (aOR=0.11, 95%C.I.=0.01, 0.64) to use kratom in the past year.
Conclusions: Kratom use among U.S. adolescents is an emerging public health concern. Identified co-use of kratom and marijuana needs to be further investigated for potential interactions. To our knowledge, this is the first national report on the epidemiology of kratom use among US adolescents.

Virtual Poster Q&A Session II: Nicotine/Tobacco

T45. Multiethnic Prediction of Nicotine Biomarkers and Associations With Nicotine Dependence

Andrew Bergen[*1], Christopher McMahan[2], Stephen McGee[3], Carolyn Ervin[3], Hilary Tindale[4], Loic Le Marchand[5], Sharon Murphy[6], Daniel Stram[7], Yesha Patel[7], Sunshim Park[5], James Baurley[3]*
[1]Oregon Research Institute, [2]Clemson University, [3]BioRealm, LLC, [4]Vanderbilt University, [5]University of Hawaii, [6]University of Minnesota, [7]University of Southern California

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Genetics/Proteomics/Metabalomics
Abstract Category Original Research

Aim: The nicotine metabolite ratio and nicotine equivalents are measures of nicotine metabolism rate and intake. Genome-wide prediction of these nicotine biomarkers will extend biomarker studies to cohorts without measured biomarkers, enable tobacco-related behavioral and exposure research, and may assist in smoking cessation therapy prognosis.
Methods: We screened genetic variants genome-wide using marginal scans for two nicotine biomarkers, the urinary nicotine metabolite ratio (uNMR) and creatinine-standardized total nicotine equivalents (TNE), in 2,239 current cigarette smokers in five ethnic groups participating in the Multiethnic Cohort Study. We applied statistical learning algorithms to build prediction models on top-ranked genetic variants and non-genetic variables for each biomarker (age, ethnicity and sex, and cigarettes per day (CPD) in a second analysis). We predicted these nicotine biomarkers using model ensembles in the training sample (internal validity). We used genome-wide data to predict nicotine biomarkers in 1,864 treatment-seeking smokers in two ethnic groups recruited into three smoking cessation trials and assessed association with dependence measures (external validity).
Results: The genomic regions with the most selected and trained variants for measured biomarkers were chr19q13.2 (uNMR), and chr15q25.1 and chr10q25.3 (TNE). We observed correlations (measured and predicted) of 0.67 and 0.68 for the uNMR and 0.65 and 0.72 TNE in the training sample. In treatment-seeking smokers, predicted uNMR (without CPD) was significantly associated with CPD, and predicted TNE (without CPD) was associated with CPD, Time-To-First-Cigarette, and Fagerström total score.
Conclusions: Nicotine metabolites, genome-wide data and statistical learning approaches develop novel robust predictive models for urinary nicotine biomarkers in a multiethnic sample. Predicted biomarker associations help define genetically influenced components of nicotine dependence. Availability of smoking cessation trial data will provide an opportunity to characterize relations between genetically determined components of dependence and cessation outcomes and assess translational relevance for application to tobacco use disorder treatment.

T46. Associations Between Smoking Motives and Self-Reported Smoking as a Function of Body Mass Index

Alice Ely[*1], Heather Keyser[1], Nathaniel Spilka[1], Teresa Franklin[1], Reagan Wetherill[1]*
[1]Perelman School of Medicine University of Pennsylvania

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Comorbidities
Abstract Category Original Research

Aim: Cigarette smoking and obesity are the leading causes of premature morbidity and mortality. Comorbid smoking and obesity increase the risk of all-cause mortality four-fold. Although research suggests that smoking motives may differ based on body mass index (BMI), it is unclear how these differences translate to smoking behavior.
Methods: Cigarette smokers (N=76; n=22 with obesity, n=29 with overweight, and n=25 lean) completed measures of current and past smoking, as well as the Smoking Motivations Questionnaire to assess reasons for smoking. Partial Pearson correlations examined associations between smoking motives subscales and smoking behavior, controlling for age and sex.
Results: Groups did not differ on age, education, cigarettes per day (CPD), pack years, or cigarette dependence, as measured by the Fagerström Test for Cigarette Dependence (FTCD). Only Indulgent smoking was correlated with

BMI (r=-0.247, p=0.045), such that higher BMI was associated with lower smoking for Indulgence. Within-group correlations revealed different associations between reasons for smoking and smoking behavior depending on BMI status. Among Lean smokers, FTCD was positively associated with Addictive, Sedative, Stimulation, and Indulgence subscale scores, and CPD was correlated with Addictive smoking motivation. Among smokers with overweight, Addictive smoking motives were associated with CPD. There were no significant associations in smokers with obesity. Post hoc MANCOVA analysis revealed a significant interaction effect of Group x Addictive Smoking on CPD ($F(2, 74)=6.65$, $p = 0.002$).
Conclusions: Findings suggest smoking motives may be less likely to drive smoking behavior in smokers with obesity; whereas, smokers with overweight or lean are motivated to smoke for specific reasons, particularly the addictive quality of smoking. These findings highlight the need for additional research on the influence of increasing BMI on cigarette smoking and to fully elucidate the interaction between obesity and smoking and the impact on treatment outcome.

T47. Complementary and Integrative Health Practices in Women With and Without Recent Tobacco Use

Divya Sharma[*1], Lillia Thumma[1], Jaclyn Sadicario[1], Anna Beth Parlier-Ahmad[1], Lisa Phipps[1], Nicole Karjane[1], Dace Svikis[1]*
[1]Virginia Commonwealth University
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Alternative Medicine
Abstract Category Original Research
Aim: With growing interest in complementary and integrative health practices (CIHP) for smoking cessation, the present study compared women with and without recent cigarette smoking on their CIHP use and measures of depression and anxiety.
Methods: Women from two OB/Gyn practices were recruited from clinic waiting areas to complete an anonymous computer-based survey about their use of CIHP, mental and physical health symptoms, and recent use of tobacco and other substances. All provided informed consent. Those reporting recent (past 30-day) cigarette smoking (N=36) were compared to those who did not (N=170). Chi-square analyses for categorical measures and Mann-Whitney U for non-normally distributed continuous variables were used to compare the 2 groups on CIHPs endorsed by >10% of the sample and symptoms of depression and anxiety.
Results: The sample was 45% Caucasian with a mean (SD) age of 38.6 (11.9) years. The most often reported CIHPs included: garlic (42.6%), massage (41.3%), and Taichi/Yoga (35.3%). The two groups differed on 6/21 CIHPs, with non-smoking women more likely than smoking women to report use of echinacea (p=.029), fish oils/omega fatty acids (p=.006), taichi/yoga (p=.010), and massage therapy (p=.003). Current smokers were more likely than nonsmokers to report CIHP use of cannabis (p=.002) and garlic (p=.036). The two groups also differed on anxiety and depression symptoms, with current smokers having higher scores than nonsmokers for both anxiety (GAD-7 medians of 5.5 and 3.0, respectively; p=.017) and depression (PHQ-9 medians of 5.5 and 2.0, respectively; p=.001).
Conclusions: Current smokers (17.5% of sample) had higher depression and anxiety scores. Smokers were less likely than nonsmokers to use such therapies as taichi/yoga and massage, and more likely to endorse use of cannabis as CIHP. From a public health perspective, this group could benefit from education and assistance with smoking cessation efforts, including mind/body techniques.

T48. Health Warning Attitudes and Smoking Cessation

Ciara Cannoy[*1], David Ledgerwood[2], Leslie Lundahl[2], Nana Bafoe[1], Samiran Ghosh[2], ShayLin Excell[1], Yasir Mehmood[1]*
[1]Wayne State University, [2]Wayne State University School of Medicine
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Policy
Abstract Category Original Research
Aim: In an effort to curb cigarette smoking, the FDA proposed the addition of health warnings to cigarette packages in 2010. Prior findings show health warnings are associated with increased negative attitudes toward

smoking. The current study aimed to explore the prospective relationship between initial attitudes toward health warnings on cigarette packages and smoking cessation two years later.
Methods: Data were taken from the Population Assessment of Tobacco and Health (PATH) Study, a longitudinal examination conducted by the NIH and FDA of tobacco use in the United States (N = 24, 527). Baseline predictors included: 1) how often warnings stopped their own cigarette use when participants were about to smoke; 2) frequency of warning avoidance; 3) health warnings believability ratings; 4) self-reported concern about warnings; 5) extent of consideration of health risks related to warnings; and 6) extent to which health warnings increased participants' intent to quit. Outcomes were frequency of cigarette use and complete smoking cessation two years following the baseline assessment.
Results: Logistic regression model analyses showed that two baseline variables predicted reduced smoking frequency two years later: 1) higher frequency of warnings stopping cigarette use and 2) increased intent to quit smoking related to health warnings ($x2(7) = 198.1$, $p < .01$). Specifically, individuals who reported that health warnings "very often" stopped their cigarette use when they were about to smoke were 2.26 times more likely to report decreased smoking two years later. Those who reported that health warnings increased their intent to quit "a lot" were 1.92 times more likely to report less frequent smoking behaviors. No baseline variables predicted complete quitting two years later.
Conclusions: Several attitudes regarding warnings on cigarette packages predict smoking behaviors longitudinally. These findings may lend support to initiatives aimed at adding more salient health warning labels to cigarette packages in the United States.

T49. Evidence for Schizophrenia-Specific Pathophysiology of Nicotine Dependence

Heather Ward[*1], Adam Beermann[2], Uzma Nawaz[2], Mark Halko[3], Amy Janes[3], Lauren Moran[3], Roscoe Brady[4]*
[1]Brigham & Women's Hospital, [2]Beth Israel Deaconess Medical Center, [3]McLean Hospital, Harvard Medical School, [4]Beth Israel Deaconess Medical Center, McLean Hospital, Harvard Medical School
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research
Aim: The prevalence of smoking in schizophrenia is three-times higher than the general population. Prior imaging studies of candidate brain circuits have not converged on a biological basis for schizophrenia's link to nicotine addiction. We therefore employed an entirely data-driven analysis of the connectome to identify both shared and schizophrenia-specific circuits of nicotine addiction.
Methods: We reanalyzed data from two neuroimaging studies using a data-driven approach. In the first cohort, thirty-five smokers (18 schizophrenia (SZ), 17 controls (HC)) underwent resting-state fMRI and clinical characterization. We used whole-connectome data analysis to correlate daily cigarette consumption with connectivity. In the second cohort, 24 participants (12SZ, 12HC) were enrolled in a crossover study of transdermal nicotine with resting-state fMRI. We calculated change in connectivity (FCnicotine – FCplacebo) and correlated change in whole-network connectivity to nicotine dose.
Results: The strongest ($p<.001$) correlate between connectivity and cigarette consumption in cohort 1 was driven by individual variation in the topography of the Default Mode Network (DMN). This effect was entirely driven by participants with schizophrenia. In cohort 2, schizophrenia subjects had DMN hyperconnectivity compared to controls in the placebo condition ($p<.05$). This difference was no longer significant during nicotine administration. We observed a linear relationship between higher nicotine dose and greater reduction in DMN connectivity ($R=-0.50$; 95% CI -0.75 to -0.12, $p<.05$).
Conclusions: Tobacco use is strongly linked to DMN organization only in participants with schizophrenia. Nicotine can directly reduce hyperconnectivity in SZ participants. Our results suggest that the high prevalence of nicotine use in schizophrenia may be a product of a hyperconnected DMN that both interferes with cognitive performance and is more sensitive to nicotine in schizophrenia compared to controls.

T50. Sex Differences in Patterns of Cigarettes and Electronic Cigarettes Use: Results From a Longitudinal Study in USA and Canada

Víctor Martínez-Loredo[*1], Alba Gonzalez-Roz[2], James Murphy[3], James MacKillop[4]*
[1]University of Zaragoza, [2]University of Oviedo, Addictive Behaviors Group, [3]University of Memphis, [4]McMaster University

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: The growing use of electronic cigarettes (e-cigs) represents a public health challenge. Most e-cigs users are also combustible cigarette smokers whose primary motivation is to quit, despite its unknown effectiveness for quitting. Moreover, a significant proportion of those who quit smoking maintain the e-cig use at long-term, raising concerns about their negative health effects. The objective was to identify patterns of cigarette and e-cigs users in two samples from US and Canada during 2 years.
Methods: 1002 young adults (58.5% females) completed a set of questions regarding socio-demographics, tobacco and e-cigs use. A latent transitional analysis was performed to obtain subgroups engaging in different patterns of cigarette and e-cigs use across four assessments. Results were compared based on participants' sex.
Results: Measurement invariance suggested the same four-class solution for both samples: 1) exclusive e-cig users, dual users, non-users, and exclusive cigarette users. Females were constantly underrepresented in the first class and overrepresented in the third one. At T1 they were also less likely to be dual users. While 54% of males (M) exclusive e-cig users at T1 quit at T2, 80% of females (F) did so. Around 28% and 24% of dual users transited to exclusive e-cig and cigarette users, respectively; being females more likely to show the latter transition. 39% vs 28% male dual users transiting between T2-T3 moved toward exclusive e-cig use. From T3-T4, 33%(M) vs 38%(F) e-cigs users quit.
Conclusions: Most exclusive e-cig users quit in the first eight months, especially among females. A third of male dual users transited to e-cig use and a quarter of female dual users did so to cigarette use. The most common pattern was to transit from dual to non-use through exclusive e-cigs use. The age 22-23 seems critical for females.

T51. The Effects of Smoking Cessation on Distress Tolerance and Insula-Based Connectivity

Merideth Addicott[*1], Stacey Daughters[2], Madison Whaley[1]*
[1]University of Arkansas for Medical Sciences, [2]University of North Carolina at Chapel Hill

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research
Aim: The insula is believed to connect the interoceptive awareness of physiological states with a cognitive control network that decides how to act or react. Thus, the insula may be an important region underlying distress tolerance (DT), which is the pursuit of a goal in spite of emotional distress (e.g., quitting smoking). Previously, we reported stronger DT task-based functional connectivity (TBFC) between the auditory cortex and the anterior insula (AI) among healthy controls. Here, we investigated whether DT TBFC relates to the ability to successfully quit smoking.
Methods: Current smokers (n = 28) and ex-smokers (n = 32) underwent a DT task during fMRI. The task consisted of an easy phase with positive auditory feedback and a hard phase with negative auditory feedback, followed by a DT phase that players could end at any time. The bilateral AI was used as a seed region of interest in a seed-to-voxel connectivity analysis.
Results: The AI was more strongly connected to the auditory cortex during the hard phase, and was more strongly connected to the middle frontal, paracingulate, lingual, and supramarginal gyrus during the easy phase. Smokers had stronger connectivity between the AI and the inferior frontal, middle frontal, and postcentral gyrus than ex-smokers. There were group x phase interaction effects in the superior frontal, orbitofrontal, dorsal premotor, and the lateral occipital cortex. (Peak-level threshold uncorrected $p < .001$, cluster-level threshold uncorrected $p < .05$).
Conclusions: As expected, the AI connected with auditory sensory regions during negative auditory feedback and with cognitive control regions during positive auditory feedback. Smokers' AI connected with cognitive control regions more strongly than ex-smokers', and interaction effects suggest that smokers had a larger decrease in connectivity from the easy to the hard phase compared to ex-smokers. These results suggest negative feedback disrupts smokers' AI-based cognitive control network more than ex-smokers'.

T52. Nicotine Uptake Following the Use of E-Liquids With Different Organic Acid Salts and Nicotine Concentrations Among Adult Smokers

Nicholas Goldenson[*1], Gal Cohen[1], Patrick Bailey[1], Saul Shiffman[2]*
[1]Juul Labs, Inc., [2]PinneyAssociates, Inc.

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Cigarette smoking delivers nicotine rapidly to the bloodstream. Electronic nicotine delivery systems (ENDS) must deliver adequate amounts of nicotine to facilitate switching among adult smokers. This controlled study examined the effects of nicotine concentration and formulation (nicotine-salt vs. freebase) on nicotine pharmacokinetics (PK).
Methods: This parallel 22-arm laboratory study (N=31-37 per arm) assessed nicotine PK following controlled use (10 puffs) of 21 non-commercialized test e-liquids (20 nicotine-salt, 1 freebase; all tobacco-flavored) in a JUUL device, compared to Usual Brand Cigarette (UBC) in 184 adult smokers. Salts formed by 11 acids (Benzoic, Malic, Levulinic, Citric, Lactic, Pyruvic, Succinic, Salicylic, Sorbic, Oxalic, Tartaric) were tested in 1.5% nicotine (18 mg/mL) concentrations and compared to freebase 1.5% (non-salt) formulation; all acids except Oxalic and Tartaric were also tested in 5.0% (59 mg/mL). PK endpoints were baseline-adjusted peak nicotine concentration (Cmax-BL), baseline-adjusted total nicotine exposure after five minutes of use (AUC0-5-BL), and time to peak nicotine concentration (Tmax).
Results: UBC (Cmax-BL 19.5 ng/mL, AUC0-5-BL 0.60 hrs×ng/mL) produced higher PK values than all ENDS conditions; 5.0% e-liquids (Cmax-BL: 6.4–12.8; AUC0-5-BL: 0.23–0.59) delivered more nicotine than 1.5% e-liquids (Cmax-BL: 3.1–5.2; AUC0-5-BL: 0.11–0.24). At 1.5%, freebase e-liquid produced lower PK values (Cmax-BL: 2.3; AUC0-5-BL: 0.08) than nicotine-salt e-liquids (Cmax-BL: 3.1–5.2; AUC0-5-BL: 0.11–0.24). Tmax was generally within 5-6 minutes. Salt formulations using Benzoic acid were greater on Cmax-BL and AUC0-5-BL than Citric acid; Salicylic acid yielded the highest peak nicotine levels.
Conclusions: When used in a JUUL device, e-liquids with higher nicotine concentrations (5.0% vs. 1.5%) delivered more nicotine. When nicotine was held constant (at 1.5%), nicotine-salt (vs. freebase) e-liquids delivered more nicotine. Nicotine delivery from e-liquids with Benzoic acid (a variation of which is used in commercial JUULpods) was greater than Citric acid. All tested e-liquids delivered less peak nicotine, and less in first five minutes than cigarettes.

T53. Electronic Nicotine Delivery Systems and Non-Suicidal Self-Injury Among University Students: Prevalence of Risk Behavior and Variation by Substance Inhaled

Sara Nutley[*1], Catherine Striley[1]*
[1]University of Florida

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavior
Abstract Category Original Research

Aim: To explore high-risk behavior among college-aged ENDS users, with a focus on self-injurious behavior.
Methods: Cross-sectional data were collected from 35,777 male and female university students participating in the 2018-2019 Healthy Minds Study. Multivariable logistic regression models were used to evaluate the relationship between ENDS use and past 12-month self-injury.
Results: One in six students (16.5%) reported past 30-day use of e-cigarettes, of whom 25.2% engaged in self-injurious behavior within the past 12 months and approximately 5.9% reported engaging in frequent self-injurious behavior. Notably, after controlling for demographic characteristics, mental health status, and co-occurring substance use, e-cigarette use remained a significant predictor of past 12-month self-injury (aOR: 1.27, 95% CI:[1.14, 1.40]). The association between ENDS use and self-injury differed by type of e-liquid consumed; those recently inhaling marijuana-based e-liquid were 66% more likely to engage in past 12-month self-injury compared to those inhaling “only flavoring” (aOR:1.66, 95% CI:[1.11, 2.47]). However, we observed no difference in self-injurious behavior among those most recently inhaling nicotine-based e-liquid and those inhaling “only flavoring".

Conclusions: Alarmingly, young adult use of ENDS products is associated with self-injurious behavior, even after controlling for mental health status and co-occurring substance use, thus adding to the growing number of studies relating young adult ENDS use and high-risk behavior. Variation in self-injurious behavior by type of e-liquid inhaled highlights the growing need for research that considers specific attributes of ENDS products that may be most harmful to overall health. As public health officials coordinate efforts that counter the rising popularity of e-cigarettes, the relationship between ENDS use and poor mental health (including self-injurious behavior) must be considered.

T54. Support for Tobacco Regulatory Approaches Among Individuals With Mental Health Conditions

Teresa DeAtley[1], Rachel Denlinger-Apte[2], Eric Donny[2], Jennifer Tidey[1]*
[1]Brown University School of Public Health, [2]Wake Forest School of Medicine

Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Comorbidities
Abstract Category Original Research

Aim: In 2018, the Food and Drug administration issued two Advanced Notices of Proposed Rulemaking (ANPRMs): one that would reduce the nicotine content of cigarettes to a minimally addictive level and one that would regulate menthol and other flavors in tobacco. The extent to which priority smoking populations, such as individuals with mental health conditions (MHCs), support these and other federally proposed tobacco regulatory policies is unknown.

Methods: Support for four tobacco regulatory approaches (restricting tobacco sales locations; banning additives and flavorings; banning menthol; reducing nicotine in cigarettes) were queried at baseline in smokers with affective disorders and serious mental illness (N= 92) enrolled in sequential clinical trials at Brown University. Logistic regressions were used to explore correlates associated with policy support while controlling for relevant covariates.

Results: Policy support was highest for nicotine reduction (62%) followed by an additives and flavoring ban (38%). Support was lowest for a menthol ban (14%) followed by restrictions on the number of locations cigarettes could be purchase (27%). Identifying as non-white and greater intention to quit were associated with higher support for restricting tobacco sales locations (OR: 3.29, 95% CI, 1.002-10.86, p=0.049 and OR: 3.00 95% CL: 1.00 -8.99, p=0.05, respectively). Identifying as non-white increased the odds of support for banning flavors and additives (OR: 3.13, 95% CI: 1.02 -9.68, p=0.047). Lastly, having a higher perceived health risk score (OR: 1.20, 95% CI, 1.002-1.44) and being older (OR: 1.05, 95% CI 1.0001-1.09) increased the odds of support for a nicotine reduction policy.

Conclusions: Targeted efforts may be needed to better understand factors underlying low support for tobacco harm reduction policies among individuals with MHCs who smoke. Such information may help the FDA to create effective health communication strategies about these policies.

Virtual Poster Q&A Session II: Opiates/Opioids

T55. Drug Analysis Services: A Harm Reduction Strategy for People Using Drugs in Large Scale Music Events

Helena Valente[1], Monica Barratt[2], Luís Fernandes[1], Marta Pinto[1]*
[1]Porto University, [2]RMIT University, Australia

Abstract Detail Human
Select Drug Category Club/Designer Drugs
Topic Harm Reduction
Abstract Category Original Research

Aim: Drug analysis enables people who use drugs to get their substances chemically analyzed and receive advice and counseling. Previous research shows that most drug users, when given accurate information about their drug content, report that they will implement actions to protect their health. However, evidence of the utility and effectiveness of the service would be improved through the incorporation of more robust measures of outcomes following the provision of drug analytic results. At the Boom 2018 event, a quasi-experimental study was

implemented, to understand the impact of drug analysis on users' risk awareness, drug-taking behaviors, and the adoption of safer drug use practices.
Methods: All service users (N= 440) were invited to fill in a survey at 3 different moments during the festival (pre-drug analysis/post-drug analysis/3 day follow-up), and another survey 6 months after the event. 342 people answered the first questionnaire, 230 answered the second and 145 answered the third one, 70 people answered a six month follow up. Multivariate statistics namely a mixed-design ANOVA with repeated measures and 2 factors and also a post hoc test.
Results: Our results support the hypothesis that behavioral intention matches actual behavior. It was also found that a very large proportion of the people who receive unwanted or unexpected results decide not to take the drug (79%), There was a statistically significant association between users' behavioral intentions and the drug-checking result ($\chi 2$ (1)= 69,59 $p < .001$). Of the people who got a high dose pill or blotter, 75% reported taking a smaller dose than initially planned.
Conclusions: Our results support the hypothesis that the provision of drug checking and counseling services promotes the adoption of safer drug use practices.

T56. Telehealth-Clinical Advocacy Project (T-CAP): An Intervention for Police Deflection Programs Facilitating Opioid Treatment

Jennifer Pankow[1], Roxanne Muiruri[1], Wayne Lehman[1], Amanda Wiese[1], Kevin Knight[1]*
[1]*Texas Christian University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: The opioid crisis has reached epidemic proportions across America. In response, one Midwestern state launched a Police Opioid Diversion Program (PODP), where individuals voluntarily enter the program for substance use (SU) treatment without fear of arrest. The Telehealth-Clinical Advocacy Project (T-CAP), a 2-year development and feasibility study, examines the impact of integrating telehealth services within this PODP. Aims: (1) Demonstrate intervention feasibility by measuring study participant receptivity and utilization of the telehealth approach, and (2) evaluate the T-CAP measure performance in gauging the impact of telehealth on initiation of in-person SU treatment and short-term retention in treatment services.
Methods: PODP male and female volunteers (N = 40) will be randomized to a (1) "treatment as usual" comparison group and asked to complete surveys, or a (2) T-CAP intervention group who will be asked to complete surveys and participate in seven telehealth sessions featuring Motivational Interviewing and three months of on-going clinical support. Analyses: Intervention feasibility will be examined using t-tests or chi-square tests of survey and app intervention data, participant characteristics, and participation scores. Likewise, t-tests or chi-square tests will assess the impact of telehealth on treatment initiation and retention with self-reports and provider treatment data, and effect sizes will be computed for group differences on multiple outcomes (e.g., treatment retention).
Results: Preliminary findings for this exploratory pilot study will focus on response trends, coupled with qualitative interview data from participants in the T-CAP telehealth group (Aim 1). SU treatment data will be prominent in this preliminary report, providing early evidence supporting the feasibility and utility of telehealth to support recovery efforts (Aim 2).
Conclusions: Successful completion of the study is expected to demonstrate the preliminary efficacy of this telehealth technology to augment SU treatment for individuals with opioid use disorder, as well as to support PODPs.

T57. The Effects of Repeated Heroin Vapor Inhalation During Adolescence on Measures of Nociception and Anxiety-Like Behavior in Adult Wistar Rats

Arnold Gutierrez[1], Eric Harvey[1], Kevin Creehan[1], Michael Taffe[1]*
[1]*University of California, San Diego*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology

Abstract Category Original Research
Aim: The aim of this study was to assess the behavioral effects of repeated heroin vapor inhalation during adolescence on measures of nociception and anxiety-like behavior in adulthood.
Methods: Adolescent female and male rats underwent twice daily 30-minute sessions of heroin vapor inhalation. Behavioral testing began at 12 weeks of age, starting with the assessment of baseline thermal nociception by warm-water tail-withdrawal across a range of temperatures. Anxiety-like behavior was then measured using an elevated plus maze approach. To assess the persistence of effects, baseline thermal nociception was again measured at 29 weeks of age. Finally, the effects of injected heroin or naloxone on warm-water tail-withdrawal were assessed.
Results: Repeated adolescent heroin vapor inhalation produced effects on baseline thermal nociception in adult female rats at 12 weeks of age. Heroin during adolescence also produced an increase in anxiety-like behavior in both male and female rats. When re-assessed at 29 weeks of age, alterations in baseline thermal nociception persisted. The anti-nociceptive effects of a heroin injections were also blunted in female and male rats at 31 weeks of age.
Conclusions: These findings demonstrate that long-term changes in nociception and the expression of anxiety-like behavior are produced as a result of heroin vapor exposure during adolescence. Furthermore, we report a persistence of effects on baseline thermal nociception and opioid anti-nociception that is not well-described in the literature.

T58. Modeling Safe Supply Programs: A Qualitative Evaluation of Two Safe Opioid Supply Programs in Vancouver, Canada

Andrew Ivsins[*1], Samara Mayer[2], Alexandra Collins[3], Jade Boyd[2], Thomas Kerr[2], Ryan McNeil[4]*
[1]University of British Columbia Faculty of Medicine, [2]British Columbia Centre on Substance Use, [3]Brown University School of Public Health, [4]Yale School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research
Aim: North America is in the midst of an overdose crisis driven by a fentanyl-adulterated toxic drug supply. The concept of "safe supply" is suggested as a potential measure to address the overdose crisis by providing a regulated alternative to illicit opioids to people with high overdose risk. Currently, two low-barrier safe supply programs operate in Vancouver through which program participants receive a daily dose of physician-prescribed hydromorphone tablets. One program operates within a supervised injection site and is nurse-administered. The other program distributes hydromorphone tablets via an automated dispensing machine. We compared the implementation contexts and operating procedures of these two-novel overdose-focused interventions.
Methods: In-depth qualitative interviews were conducted with people enrolled in the programs (52 baseline, 20 three-month follow-up interviews), and over 100 hours of ethnographic fieldwork was conducted within and around the program sites. Thematic analysis of the interviews and ethnographic observation focused on program implementation and operation, including barriers and facilitators to program uptake, access and engagement.
Results: Our findings illustrate important implementation and operational considerations of safe supply programs. Participants identified a number of factors that shaped program access, uptake and engagement, including having access to a reliable source of opioids, user agency, and program location. While both programs are considered low barrier, our study demonstrates that greater user agency can enhance program engagement.
Conclusions: Safe opioid supply programs represent a promising intervention to address North America's ongoing overdose crisis by providing people at high fatal overdose risk an alternative to the toxic drug supply. Our findings demonstrate the acceptability of these programs among people accessing illicit opioids, however lower-barrier design and operational features should be considered to improve uptake and engagement. There is significant potential for immediate scale-up of safe opioid supply programs.

T59. Provider-Identified Facilitators and Barriers to Post-Overdose Service Delivery in Emergency Departments: A Qualitative Study in Rhode Island

Alexandra Collins[*1], Francesca Beaudoin[1], Elizabeth Samuels[1], Rachel Wightman[1], Janette Baird[1]*
[1]Brown University
Abstract Detail Human

Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: Since 2016, there has been an increase in the number of patients presenting to the emergency department (ED) following non-fatal opioid overdose in the US. Given the heightened risk for repeat overdose and death following a non-fatal overdose, EDs have increasingly incorporated interventions that seek to reduce opioid-related morbidity and mortality. However, many of these interventions remain underutilized. This study examined policy-prescribed service provision for patients treated for an opioid overdose in Rhode Island EDs, hypothesizing that providers would support these services and readily offer them to patients in ED settings.
Methods: In-depth, semi-structured qualitative interviews were conducted with 55 ED providers (management and clinical staff) across Rhode Island EDs from November 2019 to July 2020. Thematic analysis of interviews focused on gaps and best practices in post-overdose care delivery, including social and structural factors driving access to, and delivery of, services.
Results: Participants highlighted how automatic service delivery (opt out vs. opt in) and the integration of peer-based services enhanced post-overdose service provision. However, social and structural factors (e.g. insurance barriers, limited outpatient treatment resources) and gaps in provider knowledge of medications for opioid use disorder created barriers to care. Addressing long ED wait times and establishing dedicated care teams for patients following an overdose were seen as critical to improving ED service delivery.
Conclusions: Our findings suggest that post-overdose service delivery within EDs is a useful approach for connecting patients to services, particularly when peer support specialists are involved. However, standardizing service delivery approaches and improving provider education of harm reduction services must be prioritized alongside state-level policy changes to improve access to care for ED patients.

T60. Findings From the UNODC-WHO S-O-S (Stop Overdose Safely) Cohort Study in Kazakhstan, Kyrgyzstan, Tajikistan and Ukraine

Anja Busse[*1], Wataru Kashino[1], Jan-Christopher Gumm[1], Dzmitry Krupchanka[2], Paul Dietze[3], Danil Nikitin[4], Tetiana Kiriazova[5], Assel Terlikbayeva[6], Mahbat Bahromov[7]*
[1]United National Office on Drugs and Crime, [2]World Health Organization, [3]Burnet Institute, [4]Global Research Institute (GLORI) Foundation, [5]Ukrainian Institute on Public Health Policy, [6]Columbia University, [7]PRISMA Research Center Tajikistan
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Understand feasibility and outcomes of take-home-naloxone programmes in four low-and middle-income countries in the framework of the UNODC/WHO SOS (Stop Overdose Safely) study
Methods: The S-O-S study benefitted nearly 16,000 people likely to witness an overdose (PWOD) in Kazakhstan, Kyrgyzstan, Tajikistan and Ukraine who were trained on opioid overdose management. 1646 study participants were followed-up in the framework of a prospective cohort study for 6 months. The primary outcome was the use of naloxone at a witnessed overdose. Both sexes were included in the study.
Results: Of the 1646 study participants, 1125 reported a history of injecting drugs. 84% completed follow-up interviews six months after the training. 34.5% reported having witnessed an overdose since baseline and 89.1% (95% CI = 86.0-91.6) of these participants reported using naloxone at a recently witnessed overdose. This figure varied from 82.4% (Ukraine) to 100% (Tajikistan) but did not vary according to participant characteristics. As for the primary outcome (usage of naloxone at a witnessed overdose), results indicate naloxone usage in line with the 90% study target.
Conclusions: The implementation of the S-O-S initiative results in the use of take-home naloxone (THN) at 90% of witnessed overdoses. Although this figure varied between countries, it was generally higher than found in previous studies. THN implementation is particularly important when emergency medical responses to opioid overdose may be lacking and/or compromised.

T61. Trajectories of Opioid Analgesic Receipt in Patients With and Without Cancer and Their Association With Opioid Overdose

Anne Black[*1], Jessica Merlin[2], Karl Lorenz[3], William Becker[1]*

[1]VA Connecticut Healthcare System, [2]University of Pittsburgh, [3]Stanford University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: As research addressing the harms of opioid therapy have typically excluded patients with cancer, we aimed to identify and validate latent trajectories of opioid prescribing among patients with and without cancer (PWC, PWOC) and understand these trajectories' relationship to opioid adverse effects or overdose (OD).
Methods: Using Department of Veterans Affairs data, we constructed a retrospective cohort of patients with incident receipt of long-term opioid therapy (LTOT), defined as 90 days of pharmacy-dispensed opioid analgesic not interrupted by >30 days, between 2010-2017. Latent trajectory models assessed milligram morphine equivalent (MME) dose patterns over time among PWOC, then replicated the solution among PWC. Validity of trajectories was assessed by association with opioid-related covariates and prediction of OD in covariate-controlled Cox proportional hazards regression models.
Results: Of 332,664 patients, 13.8% were PWC. Compared to PWOC, PWC were more likely to be male (96.4%; 93.0%), African-American (18.6%; 15.0%), and younger (64.1; 69.9 years); less likely to have an opioid use disorder (OUD) (6.2%; 9.3%), or mental health diagnosis (MHD) (55.1%; 66.3%); but more likely to experience OD (6.7%; 3.6%) (all p<.001). Validated trajectories of opioid-dose receipt for PWC and PWOC represented: (Trajectory-1) low dose, stable trend (initial dose= 14.0 vs. 18.5 MME, respectively); (Trajectory-2) low-moderate dose, decreasing trend (initial dose=54.7 vs. 28.7 MME, respectively); (Trajectory-3) moderate dose, stable trend (initial dose=47.1 vs. 47.7 MME, respectively); (Trajectory-4) moderate-high dose, increasing trend (initial dose=82.3 vs. 79.2 MME, respectively). Patients who were younger, male, white or had OUD or MHD were more likely to belong to higher-dose trajectories (Trajectory-3 or 4) than patients without these attributes. Relative to Trajectory-1, higher-dose trajectories were associated with time to OD.
Conclusions: Four trajectories summarized LTOT receipt patterns for both PWC and PWOC. With group distinctions, trajectories reflecting higher-dose patterns predicted greater risk for OD. PWC should not be excluded from opioid-related studies.

T62. Appearances and Experiences: Objective and Perceived Assessments of Neighborhoods in People who Do and Do Not Use Drugs

Anysia Lee[*1], David Epstein[1]*
[1]National Institute on Drug Abuse, Intramural Research Program
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Both objective and perceived aspects of neighborhoods are associated with health-related behaviors, including drug use. We used both types of measures in a convenience sample of Maryland residents from different neighborhoods. Our primary aim was to determine which would better differentiate people who used intoxicating drugs.
Methods: We obtained questionnaire/interview data between 2016-2019 from 811 participants. We classified them into 4 groups: non-drug users (NDU; n=133), alcohol- and/or marijuana-only users (n = 355), lifetime opioid/stimulant users in treatment (OSU-treatment; n=112), opioid/stimulant users not seeking treatment (OSU-active; n=211). Objective neighborhood measures were tract-level US Census socioeconomic data. Subjective measure was the 34-item Perceived Neighborhood Scale (PNS). We used these as predictors in separate multiple logistic regressions, each comparing the NDU group to a drug-use group. We controlled for person-level sociodemographic and psychological measures from the Addiction Severity Index (ASI) and Center for Epidemiological Studies Depression Scale.
Results: Census measures did not differentiate drug-use groups. Greater PNS Sense of Community was negatively associated [odds ratios (95% confidence-intervals)] with OSU-active status [0.59 (0.38-0.89)]. Unexpectedly, greater PNS Social Embeddedness was positively associated with OSU-active [1.46 (1.02-2.10)] and OSU-treatment [1.99 (1.24-3.26)] statuses. For OSU-treatment, this was driven largely by likelihood of helping neighbors [2.13 (1.44-3.23)]; for OSU-active, by frequent casual visits with neighbors [1.41 (1.10-1.84)]. ASI variables showed that having more past-30-day psychological problems was negatively associated with OSU-

treatment status [0.41 (0.16-0.90)], while having more close friends [0.90 (0.82-0.97)] and satisfaction with free-time companionship [0.64 (0.41-0.98)] were negatively associated with OSU-active status.
Conclusions: Active or treated opioid/stimulant users differed from nonusers primarily in their neighborhood perceptions. Responses on the Perceived Neighborhood Scale had to be examined individually to uncover aspects of the social microenvironment that may have driven the differences. These results show the usefulness of the Perceived Neighborhood Scale while offering guidance for interpretation of its subscores.

T63. Adolescent Social Isolation Drives Increased Heroin Vulnerability and Dysregulates the Dopamine System

Brianna George[1], Sara Jones[1]*
[1]*Wake Forest School of Medicine*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Our group has previously found that adolescent social isolation (aSI) stress in rodents leads to increased negative affective behaviors, alterations in dopamine system functioning, and cocaine and alcohol consumption compared to group-housed (aGH) controls. Here, we explore the impact of aSI on heroin SA and heroin-induced dopamine alterations.
Methods: Male Long-Evans rats (n=96) were housed in groups (4/cage) or isolation (1/cage) from postnatal day 28-70. Rats were then implanted with jugular catheters and individually housed in chambers that served as the home cage and SA chamber. Control aSI and aGH rats received sham catheters. Rats were trained to self-administer heroin (FR1, 0.025 mg/kg/inf). After acquisition, rats were tested on dose-responsivity on FR1, progressive ratio (PR), and escalation using a long access (LgA) paradigm. Ultrasonic vocalizations (USVs) were recorded before the last LgA session as a measure of withdrawal-induced negative affect. Lastly, we utilized ex vivo fast-scan cyclic voltammetry (FSCV) to measure dopamine release, uptake kinetics, and terminal receptor functioning in nucleus accumbens (NAc)-containing brain slices.
Results: Our results revealed that aSI rats have significantly increased rates of acquisition, breakpoints on PR, and escalation of responding on LgA in adulthood. Using FSCV, we found that stimulated dopamine release was reduced in both aSI and aGH heroin-exposed rats when compared to naïve counterparts, however; uptake rates were only reduced in heroin-exposed aSI rats. We also found that heroin aSI rats had increased activity at D2/D3 autoreceptors, suggesting greater downregulation of the dopamine system in heroin-exposed aSI rats. Further, we found increased 22 kHz USVs in heroin aSI rats, suggesting greater negative affect in heroin-exposed aSI rats during withdrawal.
Conclusions: Here, we demonstrate that aSI results in robust behavioral and neurobiological adaptions that increase vulnerability to opioids. Additionally, the intersection of aSI and heroin vulnerability may be linked to altered dopaminergic functioning in reward-related brain regions.

T64. Adjustment of the Project Ride Due to COVID-19: Opportunities for Future Treatment Engagement Strategies?

Cecile Denis[1], Kyle Kampman[1], Jose Benitez[2], David Barclay[2], Karen Dugosh[3], David Festinger[3], Kendra Viner[4], David Metzger[1]*
[1]*University of Pennsylvania,* [2]*Prevention Point Philadelphia,* [3]*PHMC,* [4]*Philadelphia Department of Public Health*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Theoretical/Commentary
Aim: In the shadow of the COVID-19 pandemic, the rate of opioid overdoses has been increasing in Philadelphia. Project RIDE (Rapid Initiation for Drug treatment Engagement) has been impacted by the mandated COVID-19 restrictions. Here, we describe the changes made to adjust to COVID-19 and we discuss the lessons learned and the potential for future treatment engagement strategies.
Results (Optional): RIDE evaluates the impact of a team (nurse practitioner, peer recovery specialist, case manager) that delivers a transitional buprenorphine/naloxone treatment from a mobile research facility as a method for linking individuals to long-term MOUD treatment. Prior to COVID-19 restrictions, most interventions

and medication delivery occurred on the mobile unit parked in neighborhoods with high prevalence of opioid overdoses. With COVID-19, significant IRB approved modifications were made to allow for continued intervention delivery, including remote screening, enrollment and induction to buprenorphine/naloxone, and the delivery of medication to participants. Other modifications included the required use of personal protective equipment for all staff and participants, limiting the number of individuals in the unit at a giving time, and a strict procedure of sanitization. The duration of the intervention was also extended from 30 to 90 days in light of the reduced access to community-based treatment programs. The mobile unit has remained in use for delivery of remote interventions, medications, and services for participants who would not have access otherwise. These remote services and medication delivery have been extensively used and have been highly rated by the participants. These changes have resulted in an increased rate of enrollment and provided opportunities to participants who would not have been engaged in treatment otherwise.
Conclusions: The efficacy and sustainability of this remote outreach and service delivery model is being evaluated as a strategy to expand MOUD treatment access to individuals at high risk of overdose.

T65. Emergency Department Buprenorphine Initiation Protocols: A National View

Clara Guo[*1], Gail D'Onofrio[1], David Fiellin[1], E. Jennifer Edelman[1], Kathryn Hawk[1], Andrew A Herring[2], Ryan McCormack[3], Jeanmarie Perrone[4], Ethan Cowan[5]*
[1]Yale University School of Medicine, [2]Alameda Health System-Highland Hospital, [3]NYU Langone School of Medicine, [4]University of Pennsylvania, [5]Icahn School of Medicine at Mount Sinai
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Emergency Department (ED)-initiated buprenorphine (BUP) for opioid use disorder (OUD) has become more common, yet limited data exist on practices around BUP initiation in this setting. We describe characteristics of ED-initiated BUP protocols from a geographically diverse sample.
Methods: In December 2020, we evaluated pre-study clinical BUP initiation protocols from all EDs participating in CTN0099 ED-INNOVATION (Emergency Department-INitiated bupreNOrphine VAlidaTION). Two investigators independently abstracted information on identification of treatment-eligible patients, BUP administration and post-discharge care. Disagreements between reviewers were examined; when consensus could not be reached, final decisions were arbitrated by a third investigator.
Results: All EDs submitted protocols representing a geographically diverse sample from 22 states. Identification of treatment-eligible patients: Before BUP initiation, 27(87%) protocols required a formal Clinical Opioid Withdrawal Scale (COWS) score; 4(13%) required a clinical diagnosis of withdrawal with optional COWS. Twenty-seven (87%) protocols recommended a minimum COWS of 8. Only 7(23%) protocols noted use of a validated measure to diagnose OUD. Twenty-one (68%) protocols listed contraindications to BUP administration. BUP administration: Initial BUP dose ranged from 2-16mg. In 14(45%) protocols, initial dose varied by COWS; 11(35%) protocols specified 4mg for COWS 8-12 and 8mg for COWS 13+. For continued withdrawal symptoms, 27(87%) protocols recommended an interval of 30-60minutes between the first and second BUP dose (range 20-360). The maximum total BUP dose in the ED ranged from 8mg to 32mg. Post-discharge care: Twenty-eight (90%) protocols recommended a BUP prescription, commonly 13(42%) 16mg daily or 8(26%) 8mg twice a day. Seventeen (55%) advised a prescription sufficient until the follow up appointment. Naloxone prescription and/or provision was suggested in 23(74%) protocols.
Conclusions: In this geographically diverse sample of EDs, initiation and induction protocols for BUP demonstrated a diversity of approaches. Future work should focus on testing best practices to continue to drive innovation for improving patient outcomes.

T66. Treatment Outcomes Differ by Race and Ethnicity Among Buprenorphine-Treated Veterans in MVP

Richard Crist[*1], Rachel Vickers Smith[2], Rachel Kember[3], Christopher Rentsch[4], Emily Hartwell[3], E. Jennifer Edelman[5], Kyle Kampman[3], Henry Kranzler[3]*
[1]University of Pennsylvania, [2]University of Louisville, [3]University of Pennsylvania, Corporal Michael J. Crescenz VAMC, [4]VA Connecticut Healthcare System, [5]Yale University School of Medicine
Abstract Detail Human

Select Drug Category Opiates/Opioids
Topic Racial/Ethnic Differences
Abstract Category Original Research
Aim: Race and ethnicity may moderate OUD treatment effectiveness. We analyzed buprenorphine treatment outcomes in the three largest racial/ethnic groups in the Million Veteran Program: Black/African American (AA), non-Hispanic White (EA), and Hispanic White (HIS). We hypothesized that AA and HIS Veterans with OUD would have worse outcomes than EA Veterans, consistent with disparities observed in other therapeutic areas.
Methods: Participants were 2,972 Veterans (407 AA, 2,390 EA, and 175 HIS) with an International Classification of Diseases-9/10 OUD diagnosis and ≥60 days of outpatient buprenorphine prescriptions from 2003-2018. Patients with severe comorbid pain diagnoses (e.g., neuropathy) were excluded. Race and ethnicity were self-reported. Treatment outcome was defined as the proportion of urine drug screen (UDS) results positive for full opioid agonists, including methadone, during the first 180 days of treatment.
Results: AA Veterans received a significantly lower maximum daily dose of buprenorphine (14.8 ± 7.1mg) than EA Veterans (16.4 ± 7.1mg, Tukey HSD $p<0.05$). Buprenorphine dose among HIS Veterans (15.6 ± 6.8mg) was intermediate, but not significantly different from the other two groups. A smaller proportion of AA Veterans (55.3%) were abstinent during buprenorphine treatment than EA (36.4%, $p<0.0001$) or HIS Veterans (42.9%, $p=0.0061$). Abstinence rates for the EA and HIS groups were not statistically different ($p=0.085$). Race/ethnicity was associated with the proportion of opioid positive UDS (ANOVA $p<0.0001$) and daily buprenorphine dose (ANOVA $p<0.0001$). AA Veterans had a higher proportion of opioid positive UDS (17.3 ± 26.3%) than EA (9.3 ± 18.4%, Tukey HSD $p<0.05$) or HIS Veterans (12.6 ± 22.4%, Tukey HSD $p<0.05$). HIS Veterans also had a higher proportion of opioid positive UDS than EA Veterans (Tukey HSD $p<0.05$).
Conclusions: Minority Veterans, particularly one's self-identifying as AA, have worse outcomes during buprenorphine treatment for OUD. This disparity may be explained in part by lower buprenorphine dosing in AAs.

T67. Selected Toll-Like Receptor Agonists Increase the Efficacy of Vaccines Against Fentanyl Use Disorder and Overdose

Bethany Crouse[*1], Shannon Miller[2], Christine Robinson[1], Valeria Gradinati[1], Linda Hicks[2], Cassandra Buhl[2], Margaret Whitacre[2], Jay Evans[2], Marco Pravetoni[1]*
[1]University of Minnesota Medical School, [2]University of Montana
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: In the United States, the majority of drug fatal overdoses are attributed to synthetic opioids such as fentanyl and its analogs. The opioid receptor antagonist naloxone is the leading treatment for opioid overdose, but it is limited in its ability to reverse overdoses of long-acting, highly potent opioids, and can only be administered post-exposure. Vaccines consisting of fentanyl-based haptens conjugated to immunogenic carrier proteins offer a novel strategy to combat fentanyl use disorder and overdose as they can be administered both prophylactically and therapeutically and have the potential to offer long-lasting protection against fentanyl's pharmacological effects and overdose in pre-clinical models. Anti-fentanyl vaccines stimulate the immune system to produce fentanyl-specific antibodies which sequester the drug in serum and prevent fentanyl distribution to the brain. Vaccination selectively reduces fentanyl-induced bradycardia, respiratory depression, antinociception, and fentanyl self-administration. To improve the clinical potential of anti-drug vaccines, adjuvants can be added to stimulate the immune system to increase the quality and quantity of the antibody response against the target drug.
Methods: Mice (n=6/group) and rats (n=6/group) were vaccinated with a lead anti-fentanyl vaccine (F-CRM) formulated in a series of Toll-like receptor (TLR) agonists. After immunization, mice and rats were challenged with fentanyl (0.05-0.45 mg/kg). Antinociception, bradycardia, respiratory depression, and distribution of fentanyl in the blood and brain were measured post-challenge.
Results: Selected TLR agonists increased the vaccine's ability to induce fentanyl-specific antibodies in both mice and rats and increased its efficacy in reducing fentanyl-induced effects. Co-administration of F-CRM formulated in selected TLR adjuvants also offered greater protection against fentanyl-induced respiratory arrest induced by overdose.

Conclusions: These data support further development of anti-fentanyl vaccines formulated in novel TLR adjuvants and warrant future studies exploring their applicability to other vaccine formulations against substance use disorders.

T68. Opioid Substitution Treatment: Factors Influencing Uptake and Retention

David Frank[*1]*
[1]New York University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: The proposed presentation will discuss preliminary findings from an ongoing study that examines the factors involved with patients' uptake and retention in Medication for Opioid Use Disorder (MOUD) treatment. It focuses in particular, on how MOUD's organizational, regulatory, and cultural approach align, or not, with the ways that patients use and benefit from MOUD.
Methods: This study uses semi-structured interviews with MOUD patients (N=23); people that use illegal opioids who are not MOUD (N=5); and MOUD treatment providers (N=10). Data was analyzed using an approach based in critical discourse analysis.
Results: Preliminary results suggest that MOUD programs are often organized in a way that makes uptake, and especially continued participation, very difficult for most people on MOUD. The biggest problem for most patients was the need to attend their clinic on a daily basis for many years, and often indefinitely. A confluence of factors including the limited hours that clinics remain open, the potential for long lines, and often unknown length of time that each clinic visit would require, severely impacted patients' ability to work, go to school, or take care of their children. This also created significant frustration and resentment among the patient population who see the organizational structure of MOUD programs as antithetical to their goals, and ultimately, led to to high levels of patient dropout.
Conclusions: MOUD programs need to be re-evaluated in line with practical needs of its patient population. The linkage of take-home doses to strict abstinence-only policies ensures that large numbers of patients will be unable to participate regardless of MOUD's ability to positively impact their lives.

T69. Prescription Opioid Supply, Fatal Drug Poisonings, and Socioeconomic Conditions in the United States

David Fink[*1], Katherine Keyes[2], Charles Branas[3], Magdalena Cerda[4], Paul Gruenwald[5], Deborah Hasin[3]*
[1]New York State Psychiatric Institute, [2]Columbia University Mailman School of Public Health, [3]Columbia University, [4]Department of Population Health, NYU School of Medicine, [5]Prevention Research Center, Pacific Institute for Research and Evaluation
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: County-level variation in drug poisoning death rates indicates the importance of understanding the confluence of ecological factors in causing these deaths. We investigated the drug-related mortality risk associated with county-level socioeconomic conditions, and the modifying effect of these conditions on the relationship between county prescription opioid supply and drug-related mortality.
Methods: We modelled the risk for four types of drug poisoning deaths (deaths involving any drugs, any opioid, prescription opioids only, and heroin) in 3109 US counties between 2006 and 2016 using prescription opioid supply and five socioeconomic indicators: unemployment, poverty rate, income inequality, Rey index, and American Human Development Index (HDI, an indicator of community well-being). Hierarchical Bayesian Poisson space-time models estimated associations between each of the socioeconomic indicators, drug-related mortality rates, and the effect modification of each indicator across county prescription opioid supply.
Results: Higher drug-related mortality rates were associated with higher income inequality (rate ratios [RR] range, 1.09-1.13), higher Rey index (RR, 1.02-1.07), and higher prescription opioid supply (RR, 1.14-1.21), and lower in counties with higher HDI (RR range, 0.75-0.92). An interaction between income inequality and HDI with

prescription opioid supply suggested that RR for prescription opioid supply was higher for heroin-related deaths in counties with higher HDI and lower income inequality.
Conclusions: In the US, prescription opioid supply was associated with higher drug poisoning deaths; associations were stronger in counties with greater community well-being and less income inequality. This information can inform health interventions in areas with varying levels of deprivation and prescription opioid supply.

T70. Primary Purpose for Committing a Crime and Past-30 Day Opioid Misuse Among Justice-Involved Children: A Statewide Sample of Justice-Involved Children

Dylan Shaw[1], Micah Johnson[2]*
[1]University of Central Florida, [2]University of South Florida
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: The prevalence of opioid misuse (OM) among justice-involved children (JIC) is significantly higher than that of children in the general population, yet little research has examined the predictors of OM among JIC. A child's criminal motive may be linked to substance misuse, particularly OM. It is hypothesized that in accordance with Goldstein's "economic compulsive model" JIC who commit crimes for material gain will have a higher likelihood of meeting the criteria for past-30-day (P30D) OM than those who commit crimes for other purposes.
Methods: The data in this study, gathered by the Florida Department of Juvenile Justice (FLDJJ), was cross-sectional and represented 79,960 male and female JIC. To test the hypothesis, logistic regression analyses were utilized.
Results: Over 2,000 JIC (2.67%) in the sample met criteria for P30D OM and 29.9% of this group committed crimes for material gain. Only 17.6% of JIC who did not meet criteria for P30D OM committed crimes for material gain. JIC who committed crimes for material gain were 2.55 times as likely ($p<0.001$) to meet criteria for P30D OM than those who committed crimes out of impulse.
Conclusions: The findings of this study appear to show that children are being incarcerated due to their inability to afford their addiction and thereby criminalizing their mental health condition. It is necessary to expand drug courts to appropriately treat children who may be suffering from addiction to curtail the effects of the criminal justice pipeline. An increased emphasis needs to be put on children who are committing crimes for material gain, as these individuals are at a much higher risk for misusing opioids. A cascade of care model has proven to be an effective framework for treating opioid use disorders. JIC could benefit from the increased treatment opportunities of implementing such a program, while simultaneously reducing recidivism rates.

T71. Exploring the Role of Temporal Dynamics in Everyday Optimistic Thinking and Mood on Decision-Making in Opioid Use Disorder

Emmanuel Alvarez[1], Darla Bonagura[2], Maëlle Gueguen[2], Joshua Zhao[1], Anna Konova[2]*
[1]Rutgers Robert Wood Johnson Medical School, [2]Rutgers University – New Brunswick
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavioral Economics
Abstract Category Original Research
Aim: Risk for reuse in opioid use disorder (OUD) has been linked to temporal changes in how people balance risk and delay for reward. However, little is known about the underlying psychological processes that lead to such changes in decision-making. One factor may be (overly) optimistic thinking which may further interact with a person's mood state to distort perception of risk or tolerance of delay. Using task-based ecological momentary assessment, we explored the interactions of mood and optimistic thinking over time on decision-making preferences.
Methods: Treatment-engaged OUD patients (N=11) and matched controls (N=10) participated in a smartphone-based longitudinal study (407 person days; range: 7-30 days/subject). All subjects reported their current optimistic beliefs and mood twice-per-day and completed decision-making tasks once-per-day for real delayed and risky monetary rewards.

Results: While optimism did not differ overall between patients and controls, optimism varied considerably across days in both groups (CV range=0-129%). These dynamics in optimistic thinking were coupled with fluctuations in mood: more positive mood was associated with more optimistic outlooks (b=0.16, p<0.01). Subjects were sensitive to risk and delay, preferring certain and sooner rewards although OUD patients tended to be less patient (b=-0.13, p<0.05) and more risk tolerant (b=0.17, p=0.13) than controls. These preferences were variable across days (CV range=0-99%) but were not significantly predicted by optimistic thinking. However, subjects were more risk tolerant when they reported better mood (b=-0.22, p<0.001), especially OUD patients (b=0.27, p<0.001).
Conclusions: These data support a dynamic relationship between optimistic thinking, mood, and decision-making preferences in OUD. While we did not find support for a direct link between belief states and decision-making, this link may be mediated by changes in mood. Future research is warranted to clarify the interactive roles of optimistic beliefs and mood states as they relate to decision preferences and opioid reuse risk.

T72. Characterizing Recent Opioid Agonist Treatment Discontinuation Trends in British Columbia, 2012-2018

Emanuel Krebs[*1], Fahmida Homayra[1], Jeong Min[1], Sue MacDonald[2], Leila Gold[3], Connie Carter[3], Bohdan Nosyk[4]*
[1]BC Centre for Excellence in HIV/AIDS, [2]Vancouver Coastal Health, [3]British Columbia Ministry of Mental Health and Addictions, [4]Simon Fraser University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Given the elevated risk of mortality immediately following opioid agonist treatment (OAT) discontinuation, peer support services to facilitate uninterrupted OAT hold promise as a new model of personalized care. We sought to describe weekly and monthly trends in OAT episode discontinuations in British Columbia to determine the potential resource needs for implementing peer support services.
Methods: This population-based retrospective study utilized a provincial-level linkage of health administrative databases to identify all people with opioid use disorder (PWOUD) who received OAT between January 2012 and August 2018. We derived the percentage of PWOUD discontinuing OAT every month for methadone and buprenorphine/naloxone and estimated peer workforce needs from the published literature. We considered weekly discontinuations between September 2017 and August 2018, accounting for weeks during which income assistance disbursement occurred.
Results: Our study included 37,207 PWOUD discontinuing 158,027 OAT episodes. Discontinuations were relatively stable month-to-month, increasing from 10.6% to 14.9% between 2012 and 2018. We estimated a need for 56-135 peers to provide monthly support services. The monthly percentage of discontinuations was 21.2% for buprenorphine/naloxone and 10.0% for methadone. Weekly discontinuations were greater in income disbursement weeks (816; IQR: 752, 901) compared to other weeks (655; IQR: 615, 683; p<0.01).
Conclusions: We identified a high, and stable rate of monthly OAT discontinuations and a consistently higher rate of discontinuing treatment among PWOUD accessing buprenorphine/naloxone. We also provided a basis for peer workforce needs to support OAT engagement in British Columbia. There is an urgent need to develop the evidence base for interventions to support OAT engagement and to improve clinical management of OUD to address the opioid-related overdose crisis.

T73. Alternative Reinforcers Increase the Effectiveness of Low Efficacy Opioids in Attenuating Oxycodone Self-Administration

Fernando de Moura[*1], Erin Conley[2], Bryan Carlson[2], Raymond Booth[3], Stephen Kohut[1]*
[1]Harvard Medical School/McLean Hospital, [2]McLean Hospital, [3]Northeastern University
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: The extent to which alternative reinforcers may enhance the effectiveness of medications to attenuate ongoing drug self-administration has yet to be systematically characterized. The present study determined whether

the presence of an alternative reinforcer could alter the effectiveness of FDA-approved medications to decrease oxycodone self-administration.
Methods: Adult squirrel monkeys (n=7; 4 females, 3 males) responded under concurrent second-order FR3(FR5:S);TO45s schedules of reinforcement for intravenous oxycodone (0.1mg/kg) or saline on one lever and 30% sweetened condensed milk or water on the other. Pretreatments with naltrexone, nalbuphine, buprenorphine, or methadone were administered under each condition.
Results: Naltrexone, a mu-opioid receptor antagonist, was >30-fold more potent when 30% milk was available, and at a dose of 0.32 mg/kg completely abolished drug self-administration while concomitantly increasing milk deliveries earned per session. When water was the alternative reinforcer, naltrexone produced a >3-fold increase in the number of oxycodone injections relative to saline pretreatment. Although the potency of nalbuphine did not change as a function of alternative reinforcer availability, when 30% milk was available, nalbuphine decreased oxycodone preference to 50% injection lever responding at moderate doses but had a limited effect at higher doses. Mu-agonists with higher efficacy, methadone and buprenorphine, did not appreciably alter the reinforcing potency of oxycodone. However, methadone significantly decreased the total number of oxycodone injections earned per session (both t's>4.3, p's<0.012). Methadone did not engender an increase in water or milk deliveries earned per session, and significantly decreased 30% milk deliveries earned per session (t_5=15, p<0.0001). When saline was the response-contingent injection, all drugs except naltrexone, elicited predominantly drug-lever responding when water was available.
Conclusions: These results suggest that antagonist medications, such as naltrexone, used in combination with alternative reinforcers may be a highly effective strategy to curtail opioid use disorders, while also being devoid of abuse-related effects often associated with agonist medications.

T74. COVID-19's Impact on Substance Abuse Treatment and Medication Assisted Therapy

Heather Olsen[*1], Colleen Haynes[1], David Grundy[1], Stevan Severtson[1], Matthew Ellis[2], Mark Parrino[3], Janetta Iwanicki[1]*
[1]Denver Health Rocky Mountain Poison & Drug Safety (RMPDS), [2]Washington University, [3]American Association for the Treatment of Opioid Dependence
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: To assess the impact of COVID-19 on opioid use disorder (OUD) treatment and medication assisted therapy (MAT) in the U.S.
Methods: Treatment centers participating in the RADARS® System Survey of Key Informants' Patients and Opioid Treatment Programs were invited to take an online survey from 07 July through 16 August 2020 to report changes to their treatment practices in response to COVID-19. Frequencies and percent of participating centers were calculated for multiple choice questions.
Results: 162 centers were invited to take the survey; of 103 respondents, 72 (69.9%) participated in the optional questions related to COVID-19 and are included in this analysis. Between March 2020 and May 2020, 15.3% of centers reported suspending new patients from entering treatment, 6.9% temporarily closed and reopened, and 76.4% remained opened. Thirty-eight centers provided methadone as a MAT to patients at their facility, of which 57.9% reported that they reduced the amount of time before patients receive take-home doses of methadone. Most centers providing methadone as MAT (79.0%) utilized telemedicine to follow up with patients receiving take-home doses of methadone and some (26.3%) centers started a home delivery methadone program. Forty centers provided buprenorphine as MAT to patients. A portion of centers (17.5%) reported starting patients on buprenorphine who would have otherwise received methadone. Telemedicine was reported as a way to initiate buprenorphine treatment (42.5%) and to follow up with patients receiving buprenorphine (72.5%).
Conclusions: Many centers altered their MAT practices to accommodate stay at home orders and continue providing care. Some centers temporarily closed or suspended new patients from entering treatment, influencing access to care for people seeking treatment for OUD. Further research is needed to understand how changes in treatment provision for OUD in response to COVID-19 impacts long-term treatment retention and success, including increased risk for negative health outcomes.

T75. Adverse Childhood Experiences and Naloxone Use Among People Living With Substance Use Disorder in New York City

Lee Hoff[*1], Joy Scheidell[2], Maria Khan[2], Alex S. Bennett[2], Luther Elliott[3]*
[1]New York University Grossman School of Medicine, [2]New York University, [3]National Development and Research Institute, Inc.

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research

Aim: To explore the association between adverse childhood experiences (ACEs), overdose risk, and the co-presence of naloxone and another person to administer it during opioid use episodes.
Methods: Using baseline data from a respondent-driven sample of people who use illicit opioids in New York City (n=576), we measured ten types of ACEs: neglect; verbal, emotional, physical, or sexual abuse; parental incarceration; parental substance abuse; parental separation/divorce; household mental illness; and physical abuse of the mother. ACEs were summed at baseline to create a score. We calculated the percentage of opioid use events in the 30 days prior to baseline during which both naloxone and a person to administer it were present for each participant. We measured cross-sectional associations between experiencing ≥4 ACEs and having 0% of opioid using events protected by these factors, controlling for age, race/ethnicity, gender, and childhood socioeconomic status.
Results: Over half (51.6%) of the sample experienced ≥4 ACEs. Experiencing ≥4 ACEs (versus 0-3 ACEs, the referent) was associated with 0% protection by naloxone and a person present (odds ratio (OR) = 1.29, 95% confidence interval (CI): 0.91, 1.82). In the adjusted model, this association strengthened (adjusted OR = 1.67, 95% CI: 1.10, 2.54). There was a trend towards a stronger association in non-Hispanic whites (OR = 1.88; 95% CI: 0.77, 4.60) versus non-Hispanic Black (OR = 1.12; 95% CI: 0.36, 3.48), Latinx (OR = 0.80; 95% CI: 0.27, 2.40), and other racial/ethnic groups (OR = 0.24; 95% CI: 0.03, 2.06). Low power yielded imprecise estimates that should be interpreted with caution.
Conclusions: Harm reduction interventions that address childhood trauma in the context of substance abuse and OD risk may mitigate overdose risk. Racial/ethnic differences in drivers of overdose risk should be explored in larger samples.

T76. Physical Therapists' Attitudes Predict the Frequency With Which They Engage in Prescription Opioid Medication Misuse Management Practices

John Magel[*1], Gerald Cochran[1], Nancy West[1], Julie Fritz[1], Mark Bishop[2], Adam Gordon[1]*
[1]University of Utah, [2]University of Florida

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: The purpose of this cross-sectional study was to evaluate the association between Physical Therapists' (PT) attitudes related to managing patients with prescription opioid medication misuse (POMM) and the frequency with which PTs engaged in POMM-related management practices.
Methods: Eligible PTs were members of the Academy of Orthopaedic Physical Therapy (AOPT) and practicing in the United States. Recruitment occurred via an email invitation and AOPT social media posts that contained a link to an online survey. The survey assessed PTs' attitudes using the subscales (role adequacy, role legitimacy, role support, job self-esteem and job satisfaction) of a modified 20–item Drug and Drug Problems Perception Questionnaire (DDPPQ). The frequency with which PTs engaged in 5 POMM-related management practices (asking and advising patients about POMM and screening, assessing and referring patients for POMM) were scored on a 7-point scale ranging from never to every time and dichotomized into low versus high frequency. Controlling for sociodemographic covariates, logistic regression models were used to evaluate the association between the DDPPQ subscales and each frequency outcome variable.
Results: The analysis included 402 respondents. The mean years since graduation from physical therapy school was 15.3 (SD=11.7). Role adequacy was associated with each frequency outcome ($p<.05$), indicating that more favorable role adequacy attitudes are associated with greater odds of engaging in more frequent POMM-related patient management practices. Role legitimacy was associated with asking and advising patients about and

assessing patients for POMM (p<.05). Role support was associated with referring patients for further POMM-related treatment (p=.01), indicating that as PTs felt greater support in their role, they engaged in POMM-related patient management practices with greater frequency.
Conclusions: PTs with a greater sense of preparedness to engage in POMM management, and greater belief that POMM management was a legitimate for PTs, were more likely to report POMM-related management practices.

T77. Patient-Level Predictors of Hospital Service Utilization in Patients With Comorbid Substance Use Disorders: A Secondary Analysis From the NavSTAR Trial

Jan Gryczynski[*1], Sharon Kelly[1], Courtney Nordeck[1], Robert Schwartz[1], Shannon Mitchell[1], Christopher Welsh[2], Kevin O'Grady[3]*
[1]Friends Research Institute, [2]University of Maryland School of Medicine, [3]University of Maryland College Park
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: Individuals with substance use disorders (SUDs) frequently use acute hospital services. In a randomized clinical trial, a patient navigation intervention for hospitalized patients with SUD (Navigation Services to Avoid Rehospitalization [NavSTAR]) reduced subsequent emergency department (ED) utilization and inpatient admissions. This secondary analysis sought to examine the extent to which selected patient characteristics independently predicted hospital service utilization and moderated the effect of the NavSTAR intervention.
Methods: This study is a secondary analysis of a randomized trial of patient navigation services. Participants were 400 medical/surgical hospital patients with comorbid SUDs randomized to NavSTAR or Treatment as Usual (TAU). This analysis examined any inpatient readmission and ED utilization within 30- and 90-day post-discharge, using multivariable logistic regression.
Results: Consistent with primary findings, NavSTAR participants were less likely than TAU participants to experience any inpatient readmission within 30 (P<0.001) and 90 (P=0.03) days, controlling for various patient factors. Women were less likely than men to be rehospitalized within 30 days (P=0.03). Greater employment problem severity (P=0.04) and hospitalization in the previous year (P=0.02) were associated with 90-day readmission, and greater employment problem severity was associated with 90-day ED utilization (P=0.046). There were no significant moderating effects of participant characteristics on the NavSTAR intervention.
Conclusions: Patient navigation can slow the cycle of repeat hospital admissions among patients with SUDs. The current analysis showed that several patient factors were independently associated with hospital utilization but did not moderate intervention effects. Future research should investigate risk factors for readmission among patients with SUDs in order to optimize interventions.

T78. The Detection of Fentanyl in Umbilical Cord Tissue and Maternal Perinatal Fentanyl Exposure: A Retrospective Chart Review

Joseph Jones[*1], Donna Coy[1], Ryan Mitacek[2]*
[1]United States Drug Testing Laboratories, [2]Charleston Area Medical Center
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: Umbilical cord (UC) presents a unique opportunity for drug testing and potential identification of NAS. However, data to guide the selection of an appropriate cut-off for UC fentanyl detection to distinguish illicit substance exposure from therapeutic in-hospital administration of fentanyl is currently lacking. The specific aim of this study was to determine if the currently available cutoff for fentanyl in UC (500 pg/g) was appropriate to distinguish illicit fentanyl exposure from therapeutic in-hospital administration of fentanyl.
Methods: A review of the medical records and UC results of births occurring at Charleston Area Medical Center Women's and Children's Hospital (CAMC) between October 01, 2018 and November 15, 2018 were analyzed for perinatal administration of fentanyl and the detection of fentanyl in the corresponding umbilical cord specimens.
Results: The study included 62 subjects and 37 received fentanyl prior to delivery. Sixty-two (62) UC specimens were received for analysis and only 1 UC was reported positive. In the 1 positive case, fentanyl was not

administered during labor and delivery. Excluding the single screen and confirm positive specimen, the mean b/b0 for the cases that received fentanyl prior to delivery was 91.3% ± 10.6% and the mean b/b0 for the cases that did not receive fentanyl was 98.2% ± 6.5%. An independent samples t test showed a mean b/b0 difference of 6.92 (95% CI: 2.54, 11.30) and this difference was significant [t(58.9) = 3.158, p = 0.003]. Linear regression analysis of the total fentanyl delivered pre-delivery and b/b0 of the fentanyl immunoassay test result for the corresponding UC was -0.087 (R2 = 0.349).
Conclusions: This study demonstrated that UC is a suitable specimen type for the detection of fentanyl. Additionally, this study has demonstrated that the cutoff selected adequately identifies illicit fentanyl use while not flagging cases where fentanyl was administered by the hospital prior to birth.

T79. National Prevalence's and Trends in Suicide Thoughts and Behavior Among U.S. Adults With Vs. Without Opioid Use Disorder From 2015-2019

Joanna Streck[1], Maria Parker[2], Kimberly Fine[2], Kelly Kalagher[3], Benjamin Bearnot[1], Stacey Sigmon[4], Renee Goodwin[5], Andrea Weinberger[6]*
[1]Massachusetts General Hospital/Harvard Medical School, [2]Indiana University, [3]Massachusetts General Hospital, [4]University of Vermont, [5]The City University of New York, [6]Yeshiva University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: The prevalence of suicide thoughts and behavior (STB) is on the rise in the United States (US) and is disproportionately represented among those with opioid use disorder (OUD). Recent estimates of STB among those with OUD are lacking and no prior studies used epidemiological data to investigate trends in STB over time among individuals with OUD. We investigated recent prevalence's and time trends of STB among US adults with vs. without OUD using five waves of cross-sectional, nationally representative, epidemiological data.
Methods: Data were drawn from the 2015-2019 National Survey on Drug Use and Health public use data files (adults>18 years old, combined N=214,505). We compared past-year suicide outcomes (i.e., thoughts of seriously considering killing self (SI), suicide plan (SP), suicide attempt (SA)) among those with a past-year OUD (heroin or non-medical prescription opioid use) to those without a past-year OUD in 2019. Adjusted logistic regression tested the association of OUD status and survey year with past-year suicide outcomes (i.e., SI, SP, SA) from 2015 to 2019. Confounders included demographics (sex/gender, age, race/ethnicity, marital status, education), past-month cigarette smoking, and serious psychological distress.
Results: In 2019, 24.7% and 4.2% of those with vs. without OUD reported SI (p<0.001); of those with SI, 42.0% and 28.4%, respectively, reported an SP (p<0.001) and 24.0% vs. 12.2% reported SA (p<0.001). In adjusted logistic regression models, OUD was associated with between 1.03- and 1.16-times higher odds of SI, SP, and SA. There were no effects of survey year or interactions between survey year and OUD status for any suicide outcomes.
Conclusions: Among US adults, having an OUD (vs. not) was associated with higher odds of past-year thoughts of suicide, plan, and attempt. Screening for suicidal ideation should occur for those reporting opioid misuse and be more routinely integrated into OUD prevention and intervention efforts.

T80. The Contribution of Drug Sharing to the Prescription Opioids' Epidemic: A Dynamic Modeling Study

Kaiming Bi[1], Tommi Gaines[1], Peter Davidson[1], Steffanie Strathdee[1], Annick Borquez[1]*
[1]University of California, San Diego
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: The uncontrolled dispensing of prescription opioids (RxO) in the United States lead to drug sharing by family, friends and acquaintances. We used dynamic modeling to estimate the contribution of RxO sharing to incidence of opioid use disorders (OUD) and fatal opioid overdoses (OD) from 2007 to 2018 in San Diego County (SDC).

Methods: We developed a deterministic model of RxO use which considers progression through five stages: No RxO use, RxO use as prescribed, non-medical RxO use, OUD and cessation and incorporating OD. We parameterized it using NSDUH data on prescription and transition rates between stages. We calibrated it to 2007-2018 data on the number of people in each RxO stage from the California Opioid Dashboard and of OD from the CDC. We selected 10,000 runs based on log-likelihood and implemented analyses to: 1)calculate the reproduction number (R0) of RxO sharing; 2)determine whether RxO sharing was necessary to the development of the observed epidemic; 3)estimate the contribution of RxO sharing to OUD and OD incidence.
Results: The model successfully reproduced observed RxO use, OUD and OD trends in SDC. We found that 1)the R0 of RxO sharing was 0.32; 2)the observed incidence of OUD and OD could not have been reached in the absence of RxO sharing. Prescription rates would have needed to be 3.8 times higher than suggested by data (3.7 versus 0.9/person/year); 3)RxO sharing contributed 51.3% (95%CI: 44.6%-58.1%) of new OUD cases and 30.9% (95%CI: 24.1%-37.8%) of OD between 2007-2018. Sharing by people using RxO non-medically accounted for 27.5%-31.2% of these outcomes.
Conclusions: While the RxO epidemic in SDC was not sustained by RxO sharing (R0<1), this practice amplified it, contributing substantially to OUD cases and OD. Quantifying such contribution across settings would provide information on heterogeneity in the risk of drug use epidemics and guide policy planning to reduce sharing.

T81. Reducing Addiction Stigma Among Primary Health Care Providers in Ukraine

Katherine LaMonaca[1], Lynn Madden[2], Valerie Earnshaw[3], Iryna Pykalo[4], Myroslava Filippovych[4], Maxim Polonsky[1], Samy Galvez[1], Sergii Dvoriak[4], Frederick Altice[1]*
[1]*Yale University School of Medicine,* [2]*APT Foundation and Yale University School of Medicine,* [3]*University of Delaware,* [4]*Ukrainian Institute on Public Health Policy*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Ukraine faces a growing HIV/AIDS epidemic driven by injection drug use. Opioid Agonist Therapy (OAT), an evidence-based HIV prevention and treatment strategy, is typically offered only by addiction treatment specialists, limiting coverage among people who inject drugs (PWID). We initiated a cluster randomized control trial to introduce and scale up OAT at 24 primary health care (PHC) clinics in 12 regions. We examine the possible facilitation of sustainable OAT expansion in PHC by reducing provider stigma towards PWIDs and OAT, via interpersonal contact with patients.
Methods: Baseline (n=422) and follow-up (n=414) survey data were collected from PHC providers between February 2018 and July 2020. Approximately one quarter (24.6% at baseline and 23.2% at follow-up) prescribe OAT. The survey included standardized instruments with adapted items for discrimination, prejudice, internal shame, fear, and stereotypes towards PWID. We analyzed whether OAT providers, who had direct contact with OAT patients, and non-OAT providers, who had indirect contact, reported lower stigma.
Results: OAT providers had significantly better scores at both baseline and follow-up compared to non-OAT providers [p<0.001, overall]. OAT provider scores on the stereotypes subscale significantly improved between baseline and follow-up [p = 0.009]. Non-OAT providers scores on the fear [p = 0.005], shame [p= 0.02], and prejudice [p= 0.04] subscales significantly improved between baseline and follow-up, but stereotypes subscale scores did not change.
Conclusions: Direct contact with PWID coupled with formal clinical training was correlated with decreased knowledge-based stigma (stereotypes) among OAT providers, while non-OAT providers experienced a reduction in feelings-based stigma (fear, shame, prejudice). These findings indicate that the integration of OAT in PHC could reduce stigma among all PHC providers, with differential effects depending on closeness of contact and level of training. Lessening stigma in PHC may mitigate barriers to treatment for PWID and thus facilitate OAT scale-up.

T82. Revisiting Spontaneous and Precipitated Opioid Withdrawal in Rats: Time Course, Sex Differences, and Scoring Software

Ken Grasing[1], Alok De[1], Prabhakar Singh[1]*
[1]*Kansas City VA Medical Center*
Abstract Detail Animal Study

Select Drug Category Opiates/Opioids
Topic Pharmacology
Abstract Category Original Research
Aim: Although rodent models are frequently used to address the mechanisms underlying withdrawal, sex differences are not well characterized and differences in spontaneous and precipitated signs are often not directly compared.
Methods: After placement of a jugular catheter, morphine was infused intravenously to a final dose of 50 mg/kg-day. Single intraperitoneal doses of vehicle or naloxone (0.3 mg/kg) were injected 1.5 to 3.5 hours after cessation of the morphine infusion in 13 female and 10 male Wistar rats. Different keystrokes were assigned to each withdrawal sign, allowing rapid software recording of the number and time course of signs in multiple subjects.
Results: Naloxone treatment produced robust signs of physical withdrawal which gradually increased following morphine cessation, reached a maximum at the 2.5-hour time point, and then declined. Spontaneous signs increased slowly over several hours following morphine cessation and did not differ from precipitated signs at the final 3.5-hour time point. Scoring based on either scaled categories or total number of signs gave a similar pattern of change over time. Neither the frequency of individual signs nor composite measures differed in female and male animals.
Conclusions: Dedicated software facilitates recording of scored behaviors during opioid withdrawal. Female and male animals exhibit signs at similar frequencies and time course. Susceptibility to precipitated withdrawal exhibits an inverted-U shaped pattern over time after cessation of morphine treatment, with peak frequency occurring at 2.5 hours. In contrast, spontaneous signs slowly increase after morphine cessation in a linear pattern, eventually being equivalent to precipitated signs.

T83. Opioids Dispensed in the United States by Prescribing Provider or Physician Specialty, 2012 – 2017

Kelly Gurka[1], Henry Young[1], Hui Hu[1], Jay Kucera[2], Linda Cottler[1]*
[1]University of Florida, [2]Envision Physician Services
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: To characterize the distribution of opioids dispensed in the US by prescribing provider type or specialty from 2012 to 2017.
Methods: Data from the IQVIA National Prescription Audit for opioids dispensed in the US during the years 2012 – 2017, stratified by prescribing specialty (provider type or physician specialty), were analyzed. National aggregate estimates were based on dispensing data for retail prescriptions in the US. All prescriptions were standardized to morphine milligram equivalents (MME) using the 2018 CDC conversion file. Number of prescriptions and total dose (MME) of opioids dispensed overall and by prescribing provider or specialty over time were calculated. The percentage of opioid dispensing by prescribing provider or specialty was also calculated.
Results: Overall, the number of prescriptions for opioids dispensed in the US declined by 26.6% from 2012 to 2017. However, among physician specialties, the number of prescriptions increased (8.8%) for pain medicine; the number of prescriptions dispensed that were written by advanced practice providers (APPs) also increased (nurse practitioners: 34.8%, physician assistants: 5.4%). Despite the increase in prescriptions, the total MME of opioids dispensed declined by nearly 20% in pain medicine; conversely, an increase in MME was observed for APPs (nurse practitioners = 19.1%; physician assistants = 1.8%) from 2012 to 2017. Though total MME dispensed increased from 2012 to 2016 for APPs, it did decline from 2016 to 2017.
Conclusions: Though the number of prescriptions for opioids written by pain specialists increased, total MME dispensed decreased by nearly a fifth, suggesting a change in the way opioids are being prescribed within the specialty. More opioids prescribed by APPs were dispensed, both in terms of number of prescriptions and total MME. Understanding the trends in opioid prescribing by specialty can inform the development of policy and medical interventions that could address the ongoing epidemic of opioid dependence and overdose.

T84. HIV Clinic-Based Extended-Release Naltrexone Versus Treatment as Usual for People With HIV and Opioid Use Disorder: A Non-Blinded, Randomized Non-Inferiority Trial

P. Todd Korthuis[1], Ryan Cook[1], Paula Lum[2], Elizabeth Waddell[1], Hansel Tookes[3], Pamela Vergara-Rodriguez[4], Gregory Lucas[5], Lynn Kunkel[1], Laura Fanucchi[6], Kim Hoffman[1], Julia Collins[7], Elizabeth Payne[7], Petra Jacobs[8], Sarann Bielavitz[1], Dennis McCarty[1]*
[1]Oregon Health & Science University, [2]University of California, San Francisco, [3]University of Miami Miller School of Medicine, [4]Ruth M Rothstein CORE Center, [5]Johns Hopkins School of Medicine, [6]University of Kentucky, College of Medicine, [7]The Emmes Company, LLC, [8]National Institutes of Health, National Institute on Drug Abuse

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Integrating opioid agonist medications for treatment of opioid use disorder (OUD) with HIV care can improve HIV outcomes, but less is known about the effect of antagonist treatment.
Methods: We conducted an open-label, non-inferiority trial randomizing 114 participants with unsuppressed HIV and OUD to HIV clinic-based extended-release naltrexone (XR-NTX; n=55) versus treatment as usual with buprenorphine or methadone (TAU; n=59) in six U.S. HIV clinics. Generalized estimating equation models compared the primary outcome of viral suppression (HIV RNA ≤200 copies/mL) at 24 weeks via intention-to-treat analysis (pre-specified risk ratio (RR) margin = 0.75) and secondary outcomes including opioid use. Enrollment was halted at 33% of target sample size due to slow recruitment resulting from advances in HIV treatment.
Results: Participants averaged 47 years old (SD=11), were 62% male, 56% Black, 37% White, and 12% Hispanic with mean CD4 count 426 cells/mm3 (SD=310) and UDS positive for fentanyl (62%), other opioids (47%), and cocaine (60%). Fewer XR-NTX participants-initiated medication compared to TAU participants (47% vs 73%). Viral suppression was comparable in the XR-NTX (52.7%) and TAU (49.2%) arms (RR 1.064; 95% CI 0.748, 1.514). Non-inferiority could not be concluded, as the lower confidence limit of the RR exceeded the margin of 0.75. In ITT analysis, past 30-day opioid use was comparable for XR-NTX vs. TAU (11.7 vs. 14.8 days; mean difference -3.1; 95% CI -8.7, 1.1). Among those initiating medication, XR-NTX participants reported fewer days of opioid use compared to TAU (6.0 vs. 13.6, mean difference -7.6; 95% CI -13.8, -0.2).
Conclusions: HIV viral suppression improved similarly for XR-NTX and TAU participants, but XR-NTX did not demonstrate non-inferiority to TAU. Though fewer than half initiated XR-NTX, those who did reported less opioid use than TAU. Better XR-NTX induction strategies are needed for successful integration of XR-NTX for OUD treatment into HIV clinics.

T85. Identifying Individuals With Opioid Use Disorder: Validity of International Classification of Diseases Diagnostic Codes for Opioid Dependence and Abuse

Pooja Lagisetty[1], Claire Garpestad[1], Angela Larkin[2], Colin Macleod[1], Derek Antoku[1], Stephanie Slat[1], Jennifer Thomas[1], Victoria Powell[1], Amy SB Bohnert[1]*
[1]University of Michigan, [2]Ann Arbor Veterans Administration

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research

Aim: Policy evaluations and health system interventions often utilize International Classification of Diseases (ICD) codes for opioid use, dependence, and abuse to identify individuals with opioid use disorder (OUD) and assess how many receive evidence-based treatments. However, ICD codes may not map directly onto the Diagnostic and Statistical Manual of Mental Disorder (DSM-5) OUD criteria and may be an inapt proxy for OUD diagnosis. This study investigates the hypothesis that ICD codes do not consistently predict DSM-defined OUD.
Methods: We conducted a clinical chart review on a national sample of 520 Veterans assigned ICD-9 or ICD-10 codes for opioid use, dependence, or abuse from 2012-2017. We extracted evidence of DSM-5 OUD criteria and other opioid misuse from clinical documentation during the month preceding and three months following initial ICD code listing, then categorized patients into four groups: 1) high likelihood of OUD, 2) limited aberrant opioid use, 3) prescribed opioid use without evidence of aberrant use, and 4) insufficient information. Positive predictive

value was calculated as the percentage of individuals with an ICD code for OUD who were categorized as having a high likelihood of OUD upon chart review.
Results: Only 57.7% [95% confidence interval (CI): 53.4-61.9%] of patients were categorized as high likelihood of OUD, 16.5% [CI 13.6-20.0%] limited aberrant opioid use, 18.9% [CI 15.7-22.4%] prescribed opioid use without evidence of aberrant use, and 6.9% [CI 5.0-9.4%] insufficient information. The positive predictive value of opioid-related ICD codes for identifying patients with a high likelihood of OUD was therefore under 60%.
Conclusions: Patients assigned ICD codes for opioid use, dependence, or abuse often lack documentation of meeting DSM-5 OUD criteria. Many receive long-term opioid therapy for chronic pain without exhibiting signs of misuse. In order to improve access to clinically appropriate treatment, robust methods for identifying OUD must be developed.

T86. Validation of a Revised Opioid Overdose Risk Behavior Scale (ORBS2)

Luther Elliott[*1], Alex S. Bennett[1], Dev Crasta[2], Alexis Roth[3], Andrew Kolodny[4]*
[1]New York University, [2]VA Center of Excellence for Suicide Prevention, [3]Drexel University, [4]Heller School for Social Policy and Management
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: To perform exploratory and confirmatory validation analyses of a revised and expanded opioid overdose risk behavior scale (ORBS).
Methods: Survey data from respondent-driven sampling group of N=576 adult age people who were, at time of enrollment, current users of unprescribed opioids and living within the 5-boroughs of New York City was used to refine the measurement of opioid OD risk behaviors. Exploratory Factor Analysis was used to validation of the ORBS2 scale to establish subscales and assess associations with self-reported overdose experiences. Longitudinal data (involving monthly follow-ups to assess changing risk behavior profiles) were used to evaluate the relative value of subscales in predicting OD experiences over time.
Results: Exploratory factor analyses refined by theory yielded 6 subscales with moderate to high degrees of convergent validity: Prescription Opioid Misuse, Risky Non-Injection Use, Injection Drug Use, Concurrent Opioid and Benzodiazepine Use, Concurrent Opioid and Alcohol Use, and Multiple-Drug Polysubstance Use. All subscales were significantly ($p < .01$) positively associated with self-reported indicators of OD. Of note, the Risky Non-Injection Use, subscale, which included use of opioid analgesic pills purchased from dealers, was the most strongly associated with past-month OD indicators (including opioid-related collapse, EMS response, other people concerned, turning blue).
Conclusions: Psychometrics for the opioid OD risk behavior subscales identified suggest the ongoing utility of risk behavioral instrumentation for epidemiological research and clinical practice focused on risk communication and minimization. Use of the entire ORBS2 measure in other areas experiencing epidemic levels of opioid-related harm stands to provide important local profiles of the proximal/behavioral factors of greatest concern for those seeking to reduce OD mortality.

T87. The Development of a Digital Intervention to Prevent the Initiation of Opioid Misuse in Adolescents in School-Based Health Centers

Lynn Fiellin[1], Kaitlyn Larkin[*1], Claudia Fernandes[1], Tyra Pendergass[1], Katy Stinchfield[2]*
[1]Yale University, [2]School-Based Health Alliance
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Prevention
Abstract Category Original Research
Aim: In 2018, 699,000 adolescents and 1.9 million young adults misused opioids and reported strikingly low perceived of risk of harm. Few interventions exist that prevent opioid misuse initiation. Digital interventions such as videogames can improve health behaviors, are accessible by adolescents, and hold promise in addressing opioid misuse prevention. We conducted focus groups and interviews with stakeholders to inform the development of a videogame prevention intervention PlaySmart, that will be tested in an RCT with school-based health centers.

Methods: From February-June 2019, we conducted focus groups: 7 with opioid-naïve adolescents (n=37), 1 with prevention specialists (n=6), 5 with School-Based Health Alliance (SBHA) adult affiliates (n=26), 3 with SBHA youth (n=15); and interviews: 1 with an individual in treatment, and 6 with opioid treatment providers (n=6). Salient themes were extracted to inform relatable storylines, characters, and graphics for PlaySmart.
Results: Of the 91 participants, mean age was 27, 71% were female, 47% were White, 18% were Black, 14% were Asian, 13% were Unknown, 37% were Hispanic. Nine themes were identified: Opioid Identification, Perceived Risk of Harm, Prescription Opioids, Mode of Learning, Opioid Accessibility, Reasons to Misuse Opioids, Mental Health, Support Systems, and Videogame Application. From these themes, six distinct story-lines were developed and included in the narrative videogame intervention: 1) Wisdom Teeth (receiving opioid prescription), 2) A Friend in Need (supporting friend in distress), 3) The Party (offered opioids at party), 4) Grandma's Pills (sharing opioid prescription within family; overdose), 5) Relationship (partner struggling with opioid misuse) and 6) My Own Journey (modeling seeking help for mental health issues). Data on effective prevention strategies, realistic depictions of addiction, implementation strategies were also collected.
Conclusions: Focus groups and interviews have identified salient themes and informed six storylines that have been included in PlaySmart to enhance its efficacy, accuracy and relatability.

T88. Missed Opportunities for HIV and Hepatitis C Virus Screening in Emergency Department Patients With Opioid Use Disorder

Michael Lyons[*1], Marek Chawarski[2], Richard Rothman[3], Lauren Whiteside[4], Ethan Cowan[5], Lynne Richardson[5], Kathryn Hawk[6], Judith Tsui[4], Robert Schwartz[7], Patrick O'Connor[2], Gail D'Onofrio[2], David Fiellin[2], E. Jennifer Edelman[2]*
[1]University of Cincinnati College of Medicine, [2]Yale University School of Medicine, [3]Johns Hopkins University School of Medicine, Department of Emergency Medicine, [4]University of Washington, [5]Icahn School of Medicine at Mount Sinai, [6]Yale University, [7]Friends Research Institute
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Prevention
Abstract Category Original Research
Aim: Individuals with untreated opioid use disorder (OUD) have high risk for HIV and hepatitis C virus (HCV). Emergency departments (EDs) care for high-risk populations and have made progress in screening. We evaluated HIV/HCV screening among ED patients with untreated OUD.
Methods: This cross-sectional analysis used data from a multi-site, hybrid type III effectiveness-implementation study promoting buprenorphine in four large, urban, academic EDs. Structured screening programs were in place for HIV at all sites and HCV at three sites. Consenting participants enrolled Feb 2017 to Jan 2019 were adult, English-speaking ED patients meeting DSM-5 criteria for OUD and not receiving formal addiction treatment. Study assessments included self-reported sociodemographics, medical provider for usual care, self-reported HIV/HCV status, related risk behaviors, and chart review for receipt of HIV or HCV screening during the ED encounter at which study enrollment occurred. Individuals reporting both HIV and HCV infection were excluded. Descriptive statistics were used to determine the proportion tested overall, by past month injection drug use (IDU), and by ED site.
Results: Among 394 enrolled, 38% reported a medical provider for usual care. There were 375 without reported HIV positive status, of whom 59 (16%) received HIV screening. Of 218 participants without known HIV who reported IDU, 33 (15%) were screened. There were 231 without reported HCV positive status, of whom 22 (9.5%) received HCV screening. Of 98 participants without known HCV who reported IDU, 9 (9%) were screened. The proportion screened across study sites ranged from 3% to 25% for HIV and 4% to 32% for HCV.
Conclusions: ED HIV/HCV screening remains insufficient among patients with untreated OUD even in ED settings with formal screening programs. Targeted HIV/HCV screening should be implemented as an important adjunct strategy until the ideal of universal screening can be more fully achieved.

T89. Equity and Transparency in Deployment of an Artificial Intelligence (AI) Screening Tool for Opioid Misuse in the Electronic Health Record of Hospitalized Patients

Majid Afshar[*1], Brihat Sharma[2], Sameer Bhalla[2], Hale Thompson[2], Elizabeth Salisbury-Afshar[1], Randy Boley[2], Niranjan Karnik[2]*
[1]University of Wisconsin - Madison, [2]Rush University

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Other
Abstract Category Original Research
Aim: Screening questionnaires have good sensitivity for identifying individuals with opioid misuse; however, limited staffing and assessment burden are barriers to routine screening. Methods in natural language processing can mine and analyze electronic health record (EHR) notes collected during routine care to identify cases. We previously developed an AI-based opioid misuse classifier but important metrics in bias and face validity are needed prior to safe deployment. We aim to demonstrate interpretability and bias checks for our opioid misuse classifier.
Methods: All inpatient notes collected in the EHR at Rush University between 2017 and 2019 were processed and mapped to medical concepts. The coded concepts served as inputs into a previously validated convolutional neural network (CNN) for opioid misuse and tested against the Drug Abuse Screening Test in 58,137 patients. CNNs are black box models; therefore, local interpretable model-agnostic explanations (LIME) was used to identify the most important features between non-Hispanic white (NHW) and non-Hispanic black (NHB) subgroups. The false negative rate (FNR) for screening was assessed between subgroups. Recalibration with isotonic regression was used to address inequities across the subgroups.
Results: The classifier had sensitivity and specificity of 0.75 (95% CI: 0.71-0.78) and 0.99 (95% CI: 0.99-0.99), respectively. NHBs had a higher FNR than NHWs (32% vs. 17%). Recalibration in NHBs did improve the FNR to 24% vs. 21%; however, this led to a 5% increase in the false discovery rate for NHBs. Among the top features for predicting opioid misuse in both NHBs and NHWs were “drug abuse”, “polysubstance abuse”, “heroin”, “cocaine”, “methadone”.
Conclusions: Our classifier had good face validity across subgroups but more false negatives in NHBs. Attempts at recalibration in NHBs improved our tool for screening but at the cost of greater false positives, which may contribute to additional stigma.

T90. User Perceptions of Medications for Addiction Treatment: A Qualitative Study

Melissa Taylor[1], Jeffrey Lai[1], Brittany Chapman[1], Stephanie Carreiro[1], Kavita Babu[1]*
[1]*University of Massachusetts Medical School*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Medications for addiction treatment (MAT) is the evidence-based standard of care for treatment of opioid use disorder (OUD), but stigma continues to surround their use. We conducted an exploratory study to characterize perceptions of different types of MAT among people who use drugs (PWUD).
Methods: This qualitative study was conducted in adults with a history of non-medical opioid use seeking care at an academic emergency department. A semi-structured interview that explored knowledge, perceptions, and attitudes towards MAT was administered. Applied thematic analysis was conducted by two independent coders.
Results: Twenty adults were enrolled. All participants (N=20) had prior experience with MAT (methadone N=11, buprenorphine N=18, and naltrexone N=6). Among participants indicating a preferred treatment modality, buprenorphine was the commonly favored agent (N=7), followed by naltrexone (N=5) and methadone (N=1). Previous experience with prolonged withdrawal symptoms upon MAT discontinuation and the perception of “trading one drug for another” were common reasons for reluctance to engage in agonist or partial-agonist therapy. While some participants preferred treatment with naltrexone, others (N=8) were unwilling to initiate antagonist therapy due to fear of severe precipitated withdrawal. Two participants favored abstinence-based recovery. Most (N=16) participants strongly considered the anticipated unpleasantness of MAT discontinuation as a barrier to initiating treatment with these agents.
Conclusions: Participants overall viewed MAT positively, but many had strong preferences for a particular agent. The perceived likelihood and severity of withdrawal symptoms during both initiation and cessation of treatment affected willingness to engage in a specific therapy. Future educational materials for PWUD may focus on comparisons of respective benefits/drawbacks of agonists, partial agonists, and antagonists. Individuals who prefer abstinence-based recovery may find naltrexone to be an acceptable adjunct.

T91. A Baker's Dozen: Discriminative Stimulus and Antinociceptive Effects of Thirteen Fentanyl Analogs

Michael Gatch[1], Andrew Tourigny[1]*
[1]University of North Texas Health Science Center
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Fentanyl analogs continue to present a public health problem. Ease of access to these compounds has led to increased use as substitutes for heroin or for prescription opioids, with an associated increase in the number of overdose deaths. The morphine-like interoceptive and antinociceptive effects of 13 fentanyl analogs were tested.
Methods: The discriminative stimulus effects of morphine, fentanyl, isopropyl U-47700, β-methyl fentanyl, ortho-methyl methoxyacetyl fentanyl, ortho-fluoro isobutyryl fentanyl, para-fluoro furanyl fentanyl, ortho-fluoro acryl fentanyl, hexanoyl fentanyl, fentanyl carbamate, para-methoxyfuranyl fentanyl, 2',5'-dimethoxy fentanyl, ortho-fluorofuranyl fentanyl, brorphine and isotonitazine were tested in male Sprague-Dawley rats trained to discriminate morphine from saline. Antinociception was tested using a warm-water tail-flick assay using male Swiss-Webster mice.
Results: Hexanoyl fentanyl and isopropyl U-47700 failed to produce full substitution in morphine-trained rats. The remaining test compounds fully substituted for the discriminative stimulus effects of morphine with potencies mostly between those of fentanyl and morphine.
Isotonitazine and ortho-fluoro acryl fentanyl were more potent than fentanyl. All of the synthetic opioids tested produced full antinociceptive effects at 50° C that were blocked by naltrexone, and all but isopropyl U-47700 were more potent than fentanyl. There was a wide range in the time courses of the test compounds, ranging from 60 to 210 min.
Conclusions: All of the fentanyl analogs produced opioid-like antinociception and at least some morphine-like interoceptive effects and therefore have the potential to be used as substitutes for legal and illegal opioids. Because most of these substances share similar mechanism of action with fentanyl and morphine, and because 10 of the 13 were more potent than morphine, they have the potential for inadvertent overdose.

T92. Feasibility of Outpatient Buprenorphine Taper and Oral Naltrexone Induction on Successful Transition to Injectable Naltrexone

Michael Mancino[1], Jeff Thostenson[1], Joseph Guise[1], Edward Nunes[2], Alison Oliveto[1]*
[1]University of Arkansas for Medical Sciences, [2]Columbia University and New York State Psychiatric Institute
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Naltrexone (NTX) is a powerful medication in maintaining opioid abstinence. NTX is limited by the need for detox and abstinence prior to NTX. Initial data from randomized, placebo-controlled outpatient trial of gabapentin (GBP) to determine feasibility of transition from BUP to depot NTX was examined.
Methods: Data from 116 participants in 12-week, randomized, placebo-controlled trial to determine adjunct GBP in prescription opioid-dependent individuals. During detox (weeks 1-3), participants attended clinic 5-6 days/ week to receive medications, attend weekly therapy and complete assessments. Participants were inducted onto 12 mg Bup by day 2, week one and randomized to placebo or GBP (800 mg BID) starting day 3, week 1. Rapid, 10-day BUP taper started day 3, week 2 and final doses decreased to 1 mg on days 4/5, week 3. Participants returned day one week 4 for 4-day oral NTX induction followed by depot NTX on day 5 (week 4). Participants submit opioid-negative urine to start NTX induction. Opioid-negative UDS or lack of opioid relapse led to participants receiving clonidine, followed by oral NTX. No other adjunctive medication were provided. Participants tapered off GBP starting day 3, week 5 until receiving final dose of 100 mg BID day 7, week 5.
Results: Fifty-three participants entered week 4. No baseline differences in sex, race or age occurred. 38.34 % of those starting the study protocol and 48.86 % that started week 4 received first NTX injection. No significant differences between placebo and GBP occurred in those receiving first NTX injection (41.38 vs. 37.5 %; p=0.76) that started the protocol or those that started week 4 (50 vs. 37.5 %; p=0.35).

Conclusions: Successful outpatient transition to depot NTX is feasible and feasibility may increase with concomitant medications for opioid withdrawal; however, GBP at 800 mg BID alone does not increase likelihood of successful NTX transition.

T93. Small Area Accessibility Analysis of Medication for Opioid Use Disorder Providers in the Continental U.S.

Marynia Kolak[*1], Paul Joudrey[2], Qinyun Lin[1], Moksha Menghaney[1], Vidal Anguino[1], Emily Wang[2]*
[1]The University of Chicago, [2]Yale University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: Access to evidence-based medications for opioid use disorder (MOUD) may be a key factor in reducing OUD-related mortality, though modeling spatial access is complex and often not standardized across different research teams. We implement a sensitivity analysis of different accessibility calculations to 2019 MOUD resources to understand and compare measures and identify associations with drug poisoning death outcomes.
Methods: We calculate and compare multiple approaches to measure accessibility to methadone, buprenorphine, and naltrexone providers in the continental United States at a zip-code scale including minimum distance, driving distance, driving time, and count of resources within a threshold. We stratify results across rural/suburban/urban area types and social vulnerability dimensions to account for varying environments. We then evaluate associations with county-scale drug poisoning deaths with aggregated accessibility results at the county scale.
Results: Across all dimensions of accessibility measures, access to MOUDs varied by type. Access to methadone providers was worse across all categories, with most pronounced scarcity in rural locations. Access to all three medications remained sparse throughout the continental U.S.
Conclusions: Measures of access vary according to the resource being utilized, dependent on both characterization of distance to be traveled and travel behavior (or travel mode) expected. Resource accessibility has a complex association with OUD prevalence at population scale. Availability to all medication types varies dramatically across the U.S., highlighting unequal access to critical resources that may be associated with worse health outcomes.

T94. Influence of Prior Trauma on Conditioned Responses to Morphine in Mice

Natrina Johnson[*1], Jessica Babb[2], Gary Kaplan[3]*
[1]Boston University, [2]Harvard Medical School, [3]VA Boston Healthcare System
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Up to 40% of people with an opioid use disorder (OUD) have co-occurring post-traumatic stress disorder (PTSD). Although it is well-known that the presence of co-occurring PTSD-OUD exacerbate symptoms of each condition, it remains unclear how the underlying neural circuitry associated with trauma and drug cues might overlap. We utilized two well-known animal models, fear conditioning (FC), and conditioned place preference (CPP), to study the impact of prior aversive learning on associative learning to morphine and aimed to identify behavioral and neurobiological differences in mice conditioned with and without conditioned fear. We hypothesized that mice with prior FC would experience greater morphine CPP compared to mice without prior FC.
Methods: C57BL/6J adult male mice (n=20) underwent auditory cued foot shock (FC) or did not receive foot shock (Sham FC; n=10/group). Afterwards, all mice underwent acquisition and subsequent extinction of morphine CPP (10 mg/kg, s.c.). All mice were exposed to the FC auditory cue immediately prior to a final CPP test. We analyzed morphine CPP reinstatement for mice that spent >50% of time in the drug-paired context with a paired t-test.
Results: Both groups of mice acquired morphine CPP, but there was no significant effect of prior FC. After 8 days of extinction training, all groups successfully extinguished their morphine CPP, and there was no effect of prior FC. The FC auditory cue significantly reinstated morphine CPP in mice that had prior FC ($t(3)=3.8$, $p=0.03$), which was not observed in the sham FC mice ($p>0.05$).

Conclusions: These data suggest that prior fear conditioning can enhance conditioned responses to morphine upon exposure to trauma cues. Ongoing analyses are examining whether the behavioral effect of prior FC is associated with the activation of VTA mesolimbic dopamine neurons using immunofluorescence. These results can inform our understanding of therapeutic approaches for PTSD-OUD comorbidity.

T95. Use of Telemedicine to Expand Medication Treatment for Opioid Use Disorder in Rural Primary Care Clinics: Leadership, Provider and Staff Perspectives

Allison Ober[*1], Alex R. Dopp[1], Sarah E. Clingan[2], Megan E. Curtis[2], ChunQin Lin[2], Stacy Calhoun[2], Sherry Larkins[2], Megan Black[2], Teresa Mata Cervantes[2], Melissa Salgado[2], Maria Hanano[2], Katie P. Osterhage[3], Laura-Mae Baldwin[3], Andrew J. Saxon[4], Emily Hichborn[5], Laurie S. Lester[5], Bethany McLeman[5], Lisa A. Marsch[5], Larissa Mooney[2], Yih-Ing Hser[2]*
[1]RAND Corporation, [2]University of California, Los Angeles, [3]University of Washington, [4]Veterans Affairs Puget Sound Health Care System Seattle, [5]Geisel School of Medicine at Dartmouth College
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Over 450,000 lives have been lost due to the opioid crisis. Although medications for opioid use disorder (MOUD) are effective and can be delivered in primary care, uptake remains limited in rural communities. Telemedicine (TM) may increase MOUD access, but little is known about factors influencing implementation in primary care. We explored perspectives of rural primary care clinic personnel about implementing MOUD in partnership with a private TM vendor.
Methods: We conducted virtual interviews with clinic leadership (N=6) and focus groups with providers (PCPs, behavioral health; N=6 groups, 28 providers) and other staff (medical assistants, registered nurses; N=8 groups, 38 staff) across 7 clinics participating in a feasibility study (Clinical Trials Network (CTN)-0102). We asked about experiences with TM and MOUD, factors influencing implementation, and impacts of COVID-19 on MOUD services. We conducted thematic analysis. Participants also rated acceptability of TM (4-item survey, 1-5 Likert scale with 5 indicating highest acceptability).
Results: Perceived benefits of vendor-based TM included reducing logistical barriers, more privacy and less stigma, and access to resources (e.g., counseling, pain management). Barriers included lack of internet in patients' homes, cost/insurance issues, lack of trust in and poor communication with TM providers, concerns about quality of care, and questions about the value of vendor-based TM over clinic-based TM and in-person care. Average TM acceptability scores were moderate (M=3.77, SD=1.00); scores were highest among leadership (M=4.90, SD=0.31) followed by providers (M=4.00, SD=0.83) and other staff (M=3.39, SD=0.97).
Conclusions: Despite reservations and challenges, rural primary care personnel perceived TM through a vendor to hold potential benefits for increasing MOUD access. Strategies to improve acceptability include increasing provider, staff and patient buy-in and collaborating more closely with the TM vendor. Structural conditions including internet availability and reimbursement issues may impede TM uptake in rural settings.

T96. Recovery During the Pregnancy to Postpartum Transition Among an Opioid Use Disorder Outpatient Buprenorphine Treatment Sample

Anna Parlier-Ahmad[*1], Michelle Eglovitch[1], Dace Svikis[1], Caitlin Martin[1]*
[1]Virginia Commonwealth University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Because addiction is a complex chronic disease, focusing solely on abstinence is an insufficient treatment goal. The opioid overdose epidemic underscores the need to shift from an abstinence-based to a holistic definition of recovery including health, quality of life, and citizenship. This study describes abstinence and non-abstinence based: 1) treatment goals in pregnancy and 2) recovery outcomes through the postpartum transition among women receiving buprenorphine for opioid use disorder (OUD) during the COVID-19 pandemic.
Methods: This secondary analytic study examines preliminary data from a longitudinal study investigating recovery among postpartum women receiving buprenorphine for OUD. The parent study is actively enrolling adult

pregnant women from one outpatient substance use disorder treatment clinic. Monthly surveys and interviews occur through 1-year postpartum including sociodemographic, substance use treatment, and recovery variables, 28-day timeline follow-back (substance use reoccurrence) and WHO quality of life (QoL) scale. Descriptive statistics are generated for treatment goals self-reported at baseline and recovery outcomes at baseline, 1, 2 and 3 months postpartum.
Results: On average, participants (n=15) are 30.1 (SD=5.7) years of age and 33.4 (SD=3.7) weeks pregnant at baseline. Participants are predominantly White (66.7%). Many have prior OUD treatment experiences (66.7%). Mean length of current treatment episode is 10.3 (SD=7.7) months. Women report both abstinence-based [no opioid use (80.0%)] and non-abstinence based [improve health (86.7%) and parenting (80%)] treatment goals. Mean days of substance use recurrence increases from pregnancy to postpartum but QoL remains high (substance use: 2.9±7.6, 4.7±9.6, 5.9±11.7, 3.5±9.9; QoL: 17.1±2.4, 18.5±2.1, 17.7±2.1, 18.2±3.1; baseline, 1, 2, 3 months postpartum respectively).
Conclusions: Pregnant women receiving buprenorphine for OUD have both abstinence and non-abstinence-based treatment goals. During the pregnancy to postpartum transition, QoL remains high even with substance use recurrence. Future work should investigate how to best employ holistic recovery-based measures in OUD treatments and research.

T97. Epidemiology of Medication for Opioid Use Disorder Utilization in the United States in 2019

Pia Mauro[*1], Sarah Gutkind[1], Hillary Samples[2]*
[1]Columbia University, [2]Rutgers Institute for Health
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Medication for opioid use disorder (MOUD) is the treatment gold standard. Multiple studies have reported low utilization of MOUD, but to date there have been no nationally representative studies of MOUD use in the United States. We estimated MOUD use among people who may benefit from opioid use disorder (OUD) treatment in 2019.
Methods: The 2019 community-based National Survey on Drug Use and Health included people ages 12+ in the United States. Past-year OUD treatment need included people a) reporting DSM-IV abuse/dependence for heroin or prescription pain relievers, or b) receiving past-year last/current specialty OUD treatment or MOUD (i.e., "medication to help reduce or stop your use of [opioids]"). We described MOUD by age and used survey-weighted Poisson models with a log link to estimate the relative risk of MOUD by OUD, age, race/ethnicity, sex, insurance, income, education, employment, and urbanicity among adults only.
Results: Only 27.8% received MOUD of approximately 2.2 million people ages 12+ who may have benefitted from OUD treatment. No adolescents ages 12-17 reported MOUD, while 22.1% ages 18-25 years, 42.3% ages 26-35 years, 30.8% ages 35-49 years, and 13.2% ages 50+ years reported MOUD. Over half (52.0%) who reported MOUD met criteria for past-year OUD. Controlling for past-year OUD and other characteristics among adults ages 18+, MOUD use was lower for ages 50+ (ref. 18-25, aRR=0.4, 95% CI=0.2-0.7), non-Black/Hispanic racial/ethnic minorities (ref. white, aRR=0.5, 95% CI=0.2-0.9), and higher among people reporting higher education (ref. high school/less, aRR=1.5, 95% CI=1.1-2.1), or unemployment (ref. employed full-time, aRR=1.8, 95% CI=1.2-2.7).
Conclusions: MOUD uptake was low among people who may have benefitted from treatment, especially for adolescents and subgroups of people of color. Considering the ongoing overdose epidemic, interventions to increase MOUD access and uptake are a public health imperative to improve health equity and opioid-related outcomes.

T98. Trajectories of Nonmedical Prescription Opioid and Heroin Use: Assessing the Long-Term Transitions and Substance Use Disorder Symptoms in Adulthood

Philip Veliz[*1], John Schulenberg[2], Sean McCabe[2]*
[1]University of Michigan School of Nursing, [2]University of Michigan
Abstract Detail Human
Select Drug Category Opiates/Opioids

Topic Epidemiology
Abstract Category Original Research
Aim: The purpose of this study is to fill a major gap in the literature by assessing unique trajectories of engagement in both nonmedical prescription opioid (NMPO) and heroin use from adolescence (age 18) to adulthood (age 50).
Methods: Panel data from eight cohorts of high school seniors (1976-1983) in the U.S. national Monitoring the Future study who were followed until age 50 (2008-2015). Both past-year NMPO and heroin use were measured at baseline (age 18) and at ten subsequent follow-ups until age 50. Additional outcomes assessed substance use disorder (SUD) symptoms based on DSM-5 criteria for alcohol, cannabis, and other drug use disorders.
Results: Latent profile analyses assessing concurrent users (use of both NMPO and heroin use) found three unique trajectory groups that included the following: (1) "age 18 concurrent use peak" trajectory group (85.4%), (2) "middle adulthood NMPO to heroin use transition peak" trajectory group (10.5%), and (3) "mid 20's NMPO to heroin use transition peak" trajectory group (4.1%). Respondents who were profiled within the "Middle adulthood NMPO to heroin use transition peak" had higher odds of indicating two or more SUD symptoms between age 35 and 50 when compared to respondents who never engaged in NMPO or heroin use, NMPO use only, heroin use only, and the two other concurrent NMPO and heroin use trajectory groups.
Conclusions: The findings from this study suggest that any misuse of prescription opioids or heroin is a significant risk factor in the development of SUD's and has a long-term impact that extends into later adulthood. Greater attention needs to be placed on the later peak concurrent use subgroup given that it is less likely to be associated with experimental use and that it has a higher occurrence of SUD.

T99. Monetary and Exercise Cost-Sensitivity of Demand for Prescription Opioids Vs. Recovery of Function in Patients With Chronic Musculoskeletal Pain

John Roache[*1], Elizabeth Lehinger[2], Brett Ginsburg[3], James Murphy[4], Donald McGeary[5]*
[1]University of Texas Health at San Antonio, [2]South Texas Veterans Healthcare System, [3]University of Texas Health Science Center at San Antonio, [4]University of Memphis, [5]University of Texas Health Science Center
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavioral Economics
Abstract Category Original Research
Aim: We used price-demand analyses to evaluate preferences for continued opioid use or recovery of function as a possible motivation to engage patients with Chronic Musculoskeletal Pain (CMP) in behavioral pain management therapy.
Methods: Adult participants (N=327, median age=45yrs) experiencing CMP and taking prescription opioids completed an online survey assessing price-demand of money vs. continued opioid use or willingness to exercise to receive opioids or recover function and willingness to engage in therapy.
Results: Respondents (female (63%) were disabled (39%) or not-working (50%), with high comorbid opioid misuse measure (COMM) scores (M=20+0.8) from taking opioids for 1-5 yrs (48%) or > 5 yrs (32%) to control chronic pain (77% rating > 7 of 10). The majority stated a desire to "get by day by day without pain" in preference to a "one-year" (90%) or "lifetime" (85%) supply of opioids, and 95% were willing to "stop taking opioids altogether" if behavioral therapy could help them engage in "activities…that you don't or can't do now because of pain". Hypothetical choices between $ money now vs a 1-month supply of opioids or recovery of function generated price-point differences ($p<0.0001$) with opioids (M=$492) worth far less than recovery (M=$62,776). When choices were posed as minutes of exercise required daily, again opioids (M=92 min) exhibited lower exercise break points ($p=0.001$) than recovery (M=131 min). COMM scores were slightly correlated ($r=0.16$, $p<.004$) with $ price-point for opioids, but not at all ($p > 0.1$) with the other measures of demand.
Conclusions: We demonstrate that CMP patients value continued opioid use less than the ability to engage in activities that pain currently interferes with. We conclude that the more highly preferred increase in activity can be used to motivate patients to engage in behavioral therapies and physical exercises that will help them to recover these functional activities.

T100. Addiction Medicine Practice-Based Research Network: An Introduction to AMNet

Robert Schwartz[*1], Diana Clarke[2], Adila Ibrahim[1], Anna Pagano[3], Debbie Gibson[2], Amy Goldstein[4], Ben Doty[2], Sejal Patel[2], Frank Vocci[1]*

[1]Friends Research Institute, [2]American Psychiatric Association, [3]American Society of Addiction Medicine, [4]National Institute on Drug Abuse
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Program Descriptions
Aim: Improving patient outcomes in office-based treatment for opioid use disorder (OUD) in the United States is important to address the ongoing epidemic. The implementation of measurement-based care (MBC) and quality improvement (QI) can potentially increase treatment success and inform clinical research. Despite the role that office-based practices play in providing OUD treatment, little is known about the patients, services, and outcomes of these settings. The aim of this presentation is to describe the Addiction Medicine Practice-Based Research Network (AMNet), formed recently through a NIDA-funded Cooperative Agreement in collaboration with the American Psychiatric Association (APA), the American Society of Addiction Medicine (ASAM), and Friends Research Institute (FRI).
Methods (Optional): AMNet aims to recruit 120 physicians, nurse practitioners, or physician assistants from office-based practices and community health and mental health centers that treat patients with substance use disorders, specifically OUD. AMNet is governed by an Executive Committee of the Cooperative's investigators. A Steering Committee provides expert counsel and direction. The Executive and Steering Committees used scoping reviews and consensus-based discussion to identify and select patient-reported outcome measures (PROMs) and quality measures to embed within PsychPRO, the APA's patient registry.
Results (Optional): AMNet's PROMs include: Tobacco, Alcohol, Prescription Medication and Other Substance Use (TAPS) Tool, Brief Addiction Monitor, Treatment Effectiveness Assessment, Short Opiate Withdrawal Scale, and PHQ-2. Further, via integration with participating providers' EHRs, data on encounters, medications, and drug testing will be extracted to track AMNet's quality measures—treatment initiation, engagement, and retention. The resulting database can be used to address clinical research questions while supporting MBC and QI.
Conclusions: Participating practices will be able to track their patient outcomes, benchmark performance on quality measures, and use AMNet for QI efforts. External investigators will be able to apply to use AMNet as a platform to discover ways to improve care and patient outcomes.

T101. Risk of Emergency Department Visits Immediately After Release From New York City Jails for Individuals With Opioid Use Disorder

Ryan McDonald[*1], Teena Cherian[2], Monica Katyal[3], Kelsey Burke[3], Andrew Biundo[3], Joshua Lee[1], Keith Goldfeld[1], Maria Khan[1], Noa Krawczyk[4], Ross Macdonald[3], Sean Murphy[5], Sungwoo Lim[2]*
[1]New York University School of Medicine, [2]New York City Department of Health and Mental Hygiene, [3]Correctional Health Services, New York City Health + Hospitals, [4]NYU Grossman School of Medicine, [5]Weill Cornell Medical College
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: Release from jail incarceration may spur emergency department (ED) utilization among individuals with opioid use disorder (OUD). We examined if incarceration is associated with elevated risk of ED visits within one year of jail release among adults with OUD.
Methods: Data from New York City (NYC) Health + Hospitals/Correctional Health Services' electronic health records and New York State Statewide Planning and Research Cooperative System ED visit records from 2011-2017 were matched. The study cohort included incarcerated adults (≥18 y.o.) in NYC jails who had OUD ascertained by clinical diagnostic criteria and were released to the community. A comparison group included adults who were not in the study cohort and had ≥1 opioid-related ED visit. Number of ED visits during one year after jail release (cohort) or average jail release date (comparison group) was counted, censoring for time reincarcerated. Accounting for baseline characteristics, rates of ED visits were compared between groups via multivariable Poisson log-linear regression modeling.
Results: Of 11,440 individuals released from jail and matched to ED visit records, 87.4% were male and 38.6% were black. Median (IQR) age was 44 (34-50) years. Of 116,457 individuals in the comparison group, most were male (63.6%) and white (65.8%) with median age of 35 (26-49) years. The average number of ED visits during

one-year post-release for study and comparison groups was 4 and 1 visits, respectively. When controlling for age, sex, race, and year of latest discharge from jail, a history of recent incarceration remained a strong, independent predictor of ED utilization (RR: 4.59; 95% CI:4.53-4.65).
Conclusions: Individuals with OUD and recent incarcerations were more likely to seek care at EDs than comparison individuals with ≥1 opioid-related visit. Disruptions or lack of access to regular health care and life challenges associated with community reentry might contribute to poor health utilization outcomes among this vulnerable population.

T102. Opioid Withdrawal Produces Sex-Specific Effects on Fentanyl-Vs.-Food Choice and Mesolimbic Transcription

Drew Townsend[*1], Kijoon Kim[1], Hannah Robinson[1], Samuel Marsh[1], Matthew Banks[1], Peter Hamilton[1]*
[1]Virginia Commonwealth University
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Opioid withdrawal is a key driver of opioid addiction and an obstacle to recovery. However, withdrawal effects on opioid reinforcement and mesolimbic neuroadaptation are understudied, and the role of sex is largely unknown.
Methods: Male (n=10) and female (n=9) rats responded under a fentanyl-vs.-food "choice" procedure during daily 2h sessions. In addition to the daily choice sessions, rats were provided extended access to fentanyl during 12h self-administration sessions. After two weeks of this regimen, the nucleus accumbens (NAc) and ventral tegmental area (VTA) of a subset of the rats were subjected to RNA sequencing. A third week of extended fentanyl self-administration and choice testing was conducted in the remaining rats to determine methadone effects on fentanyl-vs.-food choice.
Results: Prior to opioid dependence, male and female rats similarly allocated responding between fentanyl and food. Abstinence from extended fentanyl access elicited a similar increase in somatic withdrawal signs in both sexes. Despite similar withdrawal signs, opioid withdrawal was accompanied by a maladaptive increase in fentanyl choice in males and a pro-adaptive decrease in fentanyl choice in females. Behavioral sex differences corresponded with transcriptional hyperactivity in the NAc and VTA of opioid-withdrawn females relative to males. Methadone blocked withdrawal-associated increases in fentanyl choice in males but failed to further decrease fentanyl choice in females.
Conclusions: These results provide foundational evidence of sex-specific neuroadaptations to opioid withdrawal, which may be relevant to the female-specific resilience to withdrawal-associated increases in opioid choice and aid in the identification of novel therapeutic targets.

T103. Escalation and Reinstatement of Fentanyl Self-Administration in Male and Female Rats

Samantha Malone[*1], Peggy Keller[1], Lindsey Hammerslag[1], Michael Bardo[1]*
[1]University of Kentucky
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavior
Abstract Category Original Research
Aim: Previously, we found that escalation of fentanyl intake increased drug-primed reinstatement using a high dose. However, there was no effect of escalated fentanyl intake on reinstatement using the pharmacological stressor yohimbine. This study determined if escalation of intake modeled by long-access (LgA) self-administration is related to craving modeled by reinstatement elicited by a physiological stressor, mild intermittent footshock.
Methods: Adult Sprague-Dawley rats (9 males, 10 females) self-administered fentanyl across 7 daily 1-h sessions, followed by 21 sessions of either 1-hr (ShA) or 6-hr (LgA) duration. Following 14 1-h extinction sessions, reinstatement was induced using mild intermittent footshock. Multilevel modeling was used for data analyses.
Results: All rats acquired fentanyl SA (active lever change ≥1.10, $p < .0001$). When shifted to LgA sessions, LgA rats escalated fentanyl intake (change =4.66, $p < .0001$), but ShA rats did not. In extinction, compared to ShA rats,

LgA rats initially responded less (difference in log(means) =0.25, p<.05) and showed less decay of responding across sessions (difference in log(change) =0.23, p<.01). All rats reinstated to footshock (difference in means =4.79, p<.01), but there was no effect of access group or sex on footshock-induced reinstatement.
Conclusions: Escalation did not impact footshock-induced reinstatement, suggesting that escalation of intake and stress-induced craving with OUD involve dissociable mechanisms.

T104. Exploring Experiences and Preferences for Participating in Research Among Women Who Use Opioids

Sarah Bagley[*1], Ariel Maschke[1], Miriam Harris[1], Alexander Walley[1], Emily Hurstak[1], John Farley[2], Keller SG[1], Christine Gunn[1]*
[1]Boston University School of Medicine, [2]SF Department of Public Health
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: Women are under-represented in published research on substance use. We aimed to (1) demonstrate the feasibility of identifying and recruiting women by utilizing three distinct recruitment approaches and (2) to assess acceptability of each recruitment strategy and existing barriers to engagement in research.
Methods: We recruited individuals who identified as women and reported opioid use within 14 days in Boston and San Francisco using community outreach, respondent-driven sampling (RDS), and social media strategies. We conducted a 1-hour interview to explore women's experiences using drugs, prior involvement with research, and facilitators and barriers to engagement in research. We collected participant demographics, the number of participants recruited by each method, and the number of contacts between first contact and enrollment. We assessed factors related to each strategy using descriptive statistics.
Results: Of the 36 participants, mean age was 46 years; 58% were white, and 86% were non-Hispanic. About half (58%) had stable housing, 75% past 30-day benzodiazepine use, and 56% past 30-day methamphetamine use. We recruited 12 women through community outreach; two women through RDS, three through social media, and 19 by passive recruitment at venues serving people with substance use disorders. Women reported that monetary incentives facilitated participation and identified a desire to help others to give meaning to their experiences as a primary motivation: "Yeah, the money's nice, but…I'm hoping maybe something I say will help somebody else someday."
Conclusions: While several recruitment approaches are feasible to engage women who use opioids, collaboration with existing community service programs engaged the most participants and was most efficient. Multiple recruitment strategies may be needed to engage women with diverse and representative experiences. Further exploration of women's preferences for recruitment and involvement in research is needed to improve participation and ensure treatment is relevant to their needs.

T105. Evaluating the Impacts of a Free Mailed Naloxone Program in Philadelphia

Shoshana Aronowitz[*1], Rachel French[2], David Buckler[3], Peggy Compton[2]*
[1]University of Pennsylvania, [2]University of Pennsylvania School of Nursing, [3]University of Pennsylvania Center for Emergency Care Policy and Research
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research
Aim: Overdose deaths have risen since the COVID-19 pandemic began, making naloxone access vital. Despite availability at Philadelphia pharmacies, barriers may prevent individuals from accessing naloxone. A partnership between Philadelphia Department of Public Health, NEXT Distro (national nonprofit), and SOL Collective (harm reduction group) provides free naloxone-by-mail to Philadelphians. We sought to describe reported barriers to accessing naloxone & analyze the spatial distribution of program recipients.
Methods: Descriptive analysis of data from individuals who requested mailed naloxone from 3/1/2020 through 12/4/2020. Demographic characteristics were described. Free-text responses about access barriers were categorized and described. Mailing addresses were geocoded and road-network distance to nearest pharmacy was calculated. Recipient locations were spatially joined to block groups with Area deprivation index (ADI) rankings.

Block group ADI was compared between block groups with one or more recipients and all remaining block groups.
Results: Among 296 recipients, most were White (68.9%), with 10.8% identifying as Black. Nearly a third (30%) had no insurance. Frequently reported barriers to accessing naloxone through other means were: COVID-related (33.1%), lack of knowledge (14.5%), and cost (14.2%). Other barriers included transportation (9.5%) and stigma (5.7%). Nearly 88% of recipients lived within 0.6 miles of a pharmacy. Distance to closest pharmacy did not differ significantly between recipients based on whether or not they listed transportation or knowledge about where to access naloxone as a barrier. Requests were received from 221/1,336 (16.5%) of block groups in Philadelphia. The state-ranked ADI was lower (less deprived) in block groups with requests compared to the rest of Philadelphia (5.77 vs. 7.02, $p<0.001$).
Conclusions: Mailing programs increase access to harm reduction supplies. In-person access to naloxone is impeded by many barriers and may not be predicted by geographic proximity to pharmacies. Future research will focus on evaluating how recipients utilize naloxone and determining local impact on overdose rates.

T106. The Impact of Opioid Agonist Treatment on All-Cause Mortality and Specific Causes of Death: A Systematic Review and Meta-Analysis

Thomas Santo[*1], Brodie Clark[1], Matthew Hickman[2], Jason Grebely[1], Gabrielle Campbell[3], Luis Sordo[4], Aileen Chen[1], Lucy Thi Tran[1], Chrianna Bharat[1], Prianka Padmanatha[2], Grainne Cousins[5], Julie Dupouy[6], Erin Kelty[7], Robert Muga[8], Bohdan Nosyk[9], Jeong Min[10], Raimondo Pavarin[11], Michael Farrell[1], Louisa Degenhardt[1]*
[1]UNSW Sydney, [2]University of Bristol, [3]University of the Sunshine Coast, [4]Complutense University, [5]Royal College of Surgeons in Ireland, [6]University of Toulouse, Faculty of Medicine, [7]The University of Western Australia, [8]Hospital Universitari Germans Trias i Pujol, [9]Simon Fraser University, [10]BC Centre for Excellence in HIV/AIDS, [11]Epidemiological Monitoring Center on Addiction, Azienda USL Bologna
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Pharmacology
Abstract Category Original Research
Aim: To estimate the impact of OAT, on all-cause and cause-specific mortality. We also examined risk in specific time periods in and out of treatment, setting (community and incarceration), and participant characteristics.
Methods: We searched Embase, MEDLINE, and PsycINFO through January 2020; clinical trial registries, and previous relevant Cochrane reviews. All observational studies that collected data on all-cause or cause-specific mortality among people with opioid dependence in and out of OAT were included. Randomised controlled trials (RCTs) reporting on mortality were also included. Study authors were contacted to obtain additional data. We aligned with GATHER, PRISMA and MOOSE guidelines. Data on study, participant and treatment characteristics were extracted; person-years, and all-cause and cause-specific mortality. CMRs for each period and rate ratios (RRs) were pooled using random-effects meta-analyses.
Results: 15 eligible RCTs, N=3,852 participants; 36 cohort studies, N=749,634. Cohort studies found all-cause mortality during OAT more than halved compared to time out-of-OAT (RR=0.47; 95%CI 0.42-0.53). This effect was similar geographically, by gender, age, among HIV-positive or HCV-positive people, and people who inject. It was not different for methadone (RR=0.47; 95%CI 0.41-0.54) vs. buprenorphine (RR=0.34; 95%CI 0.26-0.45). There was lower risk of drug-related, suicide, alcohol-related, cancer and cardiovascular mortality during OAT. In the first four weeks of methadone, all-cause mortality was almost double that in the remainder of OAT; it was six-times higher in the four-weeks following OAT cessation, remaining double the rate for remainder of time out-of-OAT. Evidence suggests an extremely strong protective effect of OAT when incarcerated and after release from incarceration, particularly suicide and overdose.
Conclusions: OAT reduces multiple causes of death. Nonetheless, access to remains limited, and coverage is far too low. Work to scale up access could have important population-level benefits.

T107. Disparities in Metabolic-Related Medical Comorbidities Among Adults With Opioid Dependence

Taylor Ochalek[*1], F. Gerard Moeller[1]*
[1]Virginia Commonwealth University
Abstract Detail Human
Select Drug Category Opiates/Opioids

Topic Comorbidities
Abstract Category Original Research
Aim: Opioid dependence has been associated with medical comorbidities such as obesity, diabetes, and metabolic syndrome markers, contributing to potentially worse drug use and treatment outcomes. Minority patients with opioid dependence may be at a heightened risk of experiencing these adverse medical comorbidities. Here we examined racial differences in medical comorbidities among opioid dependent adults in the Virginia Commonwealth University Health System.
Methods: Data were obtained from TriNetX (Cambridge, MA), a federated health network dataset of anonymized electronic medical records. We compared the prevalence of overweight and obesity and type 2 diabetes mellitus (T2DM) diagnoses, and laboratory measures, including: mean body mass index (BMI), blood pressure, hemoglobin A1c (HbA1c), cholesterol (HDL and LDL), and triglycerides in Black (N=4,070) vs. White (N=5,230) patients diagnosed with opioid dependence.
Results: Black vs. White patients presented with a significantly higher prevalence of overweight and obesity (31% vs. 23%) and of T2DM (30% vs. 16%) (p's<0.0001). Black patients also had a higher BMI (28.8 + 7.6 vs. 28.2 + 7.2 kg/m2), systolic (133 + 23.5 vs. 127 + 20.1 mmHg) and diastolic (80.2 + 14.4 vs. 76.6 + 12.9 mmHg) blood pressure, and HbA1c (6.4 + 2.0 vs. 6.2 + 1.8 %) relative to White patients (p's<0.01). In contrast, Black vs. White patients had higher HDL (48.3 + 17.5 vs. 44.4 + 16.2 mg/dL) and lower LDL (97.2 + 35.8 vs. 100 + 37.4 mg/dL) cholesterol, and lower triglycerides (120 + 94.2 vs. 159 + 226 mg/dL) (p's<0.05).
Conclusions: Overall, this sample of opioid dependent adults presented with a substantial risk of metabolic syndrome, with Black patients exhibiting a generally higher prevalence of metabolic-related medical comorbidities (i.e., overweight/obesity, T2DM). These findings highlight negative health effects experienced by opioid dependent patients and may guide efforts to improve medical and associated psychiatric outcomes in this vulnerable population.

T108. Evaluating Patient Preferences Towards New and Established Medications for Opioid Use Disorder (MOUD) Using Conjoint Analysis

Thomas Hassett[*1], Dharushana Muthulingam[2], Lynn Madden[3], Fraenkel Liana[1], Frederick Altice[1]*
[1]Yale University, [2]Washington University, [3]APT Foundation
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: The United States is in the midst of an opioid epidemic, which has worsened during the global COVID-19 pandemic and is related to increased HIV and HCV transmission. Uptake of MOUD is limited, despite the availability of multiple effective options and formulations.
Methods: We evaluated preferences for five FDA approved treatments using conjoint analysis. Five attributes—induction, location and route of administration (oral, sublingual, injection), mortality risk, side effects, and withdrawal symptoms—were used to create a 12-task discrete choice experiment where participants selected one of two hypothetical medications or a 'no medication' option.
Results: Of 530 patients surveyed, the majority was male (59%), white (55%), and the median age was 36 (range 18-74) years. Overall, 52% of patients were not prescribed MOUD, while the remainder was prescribed methadone (38%), buprenorphine (9%) buprenorphine, and extended-release naltrexone (1%). Nearly one-third (29%) had never been prescribed MOUD. Route of administration accounted for 56% of choices, followed by medication withdrawal symptoms (21%), initiation procedures (18%), side effects (2%), and risk of death (3%). Linear class analysis revealed five clinically relevant subgroups. Group 1 (18.5% of sample) preferred structured treatment in a daily supervised clinic setting. Group 2 (30.8%) preferred medications that minimized mortality risk. Group 3 (11%), were disproportionately more likely to select the 'no medication' option. Segmentation analysis identified group 3 as comparatively non-white (X2=39.93, p<0.001), less experienced with MOUD (X2=25.813, p<0.001), and less likely to ever consider MOUD (X2=48.373, p < 0.001). Groups 4 (19.4%) and 5 (20.3%) preferred medications with minimal withdrawal symptoms with induction.
Conclusions: Practical considerations for location and route of administration of MOUD drive patient decisions. Subgroup preferences differ not only on the basis of which MOUD but also whether or not to start MOUD. These findings provide a framework for developing tools to promote MOUD uptake.

T109. Post-Traumatic Stress Disorder Associated With Affective Dysregulation, Pain, and Opioid Use Among Patients With Opioid Use Disorder

Tabitha Moses[1], Leslie Lundahl[1], Mark Greenwald[2]*
[1]Wayne State University School of Medicine, [2]Wayne State University

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Comorbidities
Abstract Category Original Research

Aim: Individuals with post-traumatic stress disorder (PTSD) are at higher risk of developing substance use disorders (SUDs). Among those with SUDs, little is known about differences between those with PTSD and those without. Given the widespread impact of trauma, it is likely that individuals with both PTSD and SUD will demonstrate different emotional and behavioral phenotypes compared to those with only one diagnosis. This study explored the impact of PTSD on behavioral and cognitive outcomes among people in treatment for opioid use disorder (OUD).
Methods: Forty-two individuals early in medication treatment for OUD completed assessments to evaluate substance use patterns (Drug History and Use Questionnaire, Current Opioid Misuse Measure [COMM]), executive functioning (Go/No Go Task, Wisconsin Card Sorting Task, Psychomotor Vigilance), emotion regulation (Perceived Stress Scale [PSS], Distress Tolerance Scale [DTS]), mood (Beck Depression Inventory [BDI-II], State-Trait Anxiety Inventory [STAI]), and pain (Brief Pain Inventory [BPI]).
Results: Participants with (n=13) vs. without (n=29) a lifetime PTSD diagnosis did not differ on demographic characteristics. Those with PTSD reported significantly ($p<.05$) higher mean scores for depressive symptoms (BDI-II: 27.2±9.8 vs. 15.0±8.9), trait anxiety (STAI: 52.9±11.5 vs. 41.1±11.9), perceived stress (PSS: 33.3±3.8 vs. 29.7±3.9) and lower distress tolerance (all DTS subscales). Individuals with PTSD endorsed significantly higher rates of past 30-day pain and indicated pain had significantly worse impact on their daily functioning and mood (BPI) than those without PTSD. Those with PTSD reported significantly higher rates of past 30-day opioid misuse (COMM: 21.4±13.1 vs. 12.8±10.4). PTSD history did not influence measured executive function.
Conclusions: Within this sample of patients with OUD, PTSD was associated with greater affective dysregulation, pain, and opioid misuse. These findings provide insight into the relationship between PTSD and substance use and identify important areas of focus for personalized treatments.

T110. Stimulant Use Over Time Among Persons With Opioid Use Disorders Treated With Buprenorphine/Naloxone Versus Extended-Release Naltrexone

Judith Tsui[1], Aimee Campbell[2], Martina Pavlicova[2], Tse-Hwei Choo[2], Jennifer Scodes[2], Joshua D. Lee[3], Matisyahu Shulman[2], Edward V. Nunes[2], John Rotrosen[3]*
[1]University of Washington, [2]Columbia University, [3]New York University

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research

Aim: To describe cocaine (COC) and methamphetamine/amphetamine (MA/A) use among patients treated for OUD with buprenorphine/naloxone (BUP-NX) or extended-release naltrexone (XR-NTX), and explore whether BUP-NX is associated with greater reductions in stimulant use compared to XR-NTX.
Methods: Secondary analysis of data from X:BOT, a multi-site, open-label, randomized controlled trial of XR-NTX versus BUP-NX for 24 weeks. Dependent variables were COC and MA/A use defined by positive urine drug toxicology or self-report. Main independent variable was treatment assignment (BUP-NX v. XR-NTX). The sample was "intention-to-treat". Longitudinal mixed-effects logistic regression models were fit for the odds of COC or MA/A use. Predictors included treatment arm, study visit, and baseline stimulant use. Interactions between the three predictors were also explored.
Results: Among 570 participants with OUD, baseline use of COC was observed in 203 (35.6%) and of MA/A in 105 (18.4%); only 31 (5.4%) used both. For MA/A use, there was no significant treatment effect over the study period, though BUP-NX subjects, on average, had about half the odds of MA/A use compared to XR-NTX subjects (OR=0.50; p=0.0511). In the same model, baseline use and study visit were both significantly associated with MA/A use, with the odds increasing by 4% for each later visit. For COC use, there was a significant 3-way interaction between treatment arm, visit and baseline COC use. Among baseline COC users, BUP-NX had

significantly greater odds of use early, but this effect became non-significant over time. Among baseline non-users, BUP-NX had significantly lower odds of cocaine use early, but this effect also became non-significant over time.
Conclusions: These secondary analyses of patients with treated OUD found no significant difference in MA/A use between BUP-NX and XR-NTX treatment arms; however, significant effects of BUP-NX on COC, which differed in direction by baseline COC use, were observed early in participation.

T111. Correlates of Perceived Discrimination Among Patients in Methadone Maintenance Treatment

Uzoji Nwanaji-Enwerem[*1], Mark Beitel[2], Kathy Eggert[3], Xiao Zheng[2], Marina Gaeta[2], Nancy Redeker[1], Lynn Madden[2], Lindsay Oberleitner[1], David Oberleitner[4], Declan Barry[2]*
[1]Yale University, [2]Yale University and APT Foundation, [3]APT Foundation, [4]University of Bridgeport
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research
Aim: Although studies have found that discrimination (unequal or unfair treatment) related to demographics (e.g., race, sexual minority status) is associated with substance use disorder (SUDs), few studies have examined perceived discrimination related to SUDs among patients in treatment. The aim of this study was to investigate the correlates of perceived discrimination related to SUD among patients receiving methadone maintenance treatment (MMT).
Methods: Participants were164 patients in MMT at the APT foundation, a non-profit community-based organization in Connecticut, who completed measures of demographics; diagnosis-related characteristics, including the Brief Symptom Inventory (BSI) and Depressive Experiences Questionnaire (DEQ); and treatment-related characteristics. Perceived discrimination was measured on a seven-point Likert-type scale ranging from 1 (“Not at all”) to 7 (“Extremely”) in response to the item: “I often feel discriminated against because of my substance abuse.” A median split was used to categorize participants into “low” and “high” discrimination groups. Correlates of high and low discrimination were analyzed with bivariate and logistic regression models.
Results: 94 participants (57%) reported high discrimination. Bivariate analyses identified 5 statistically significant correlates of discrimination (P’s < 0.05): age, race, BSI Depression, DEQ Dependency, and DEQ Self Criticism. In the final logistic regression model, those reporting high (versus low) discrimination were more likely to have depressive symptoms (BSI Depression; odds ratio [OR] 1.04; confidence interval [CI], 1.00 - 1.09) and be self-critical (DEQ Self-Criticism; OR 1.04; CI, 1.01-1.07).
Conclusions: Patients in MMT who report discrimination related to their SUD are more likely to be depressed and self-critical. Future research should examine the possible intersectionality of multiple sources of perceived discrimination among this clinical population and explore longitudinally the directionality of the apparent relationships between discrimination related to SUD, depression, and self-criticism.

T112. Feasibility of a Pilot Study on a Prevention Intervention for Opioid Use Among Justice-Involved Youth and Their Families

Yang Yang[*1], Lillyan Shelley[1], Elizabeth Joseph[1], Danica Knight[1]*
[1]Texas Christian University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: Justice-involved (JJ) youth are at high risk of substance use, dysfunctional family/social relationships, and complex trauma. The current study (1) piloted a prevention intervention for opioid use, Trust-based Relational Intervention® (TBRI), that leverages family systems by providing emotional and instrumental guidance, support, and role modeling, and (2) tested the feasibility of involving and engaging families in the intervention.
Methods: A mixed-methods strategy was used in this ongoing study in two JJ residential facilities. Eight JJ-youth (ages: 14-17; 7 males) and nine female caregivers (ages: 34-62) participated in 9 youth-only, 10 caregiver-only, and 4 joint-roleplay sessions virtually. Baseline assessment included TCU Drug Screen V (TCUDS), Strength and

Difficulties Questionnaire (SDQ), Adverse Childhood Experiences (ACEs), and TCU Family Friends Scale (FFS). Other data included session notes and end-of-training caregiver interviews.
Results: Six youth reported severe substance use disorder (TCUDS ≥ 4). Three youth used opioids, and two indicated opioid overdose. Youth had high-level SDQ difficulties (thresholds for abnormal range: 17-40; youth/caregivers: M(SD) = 22.88(3.48)/25.71(8.20)) via self-report and caregivers' report of youth behavior. Five youth and four caregivers reported severe ACEs (≥ 4). Participants reported high-level family control and conflict (youth/caregivers: M(SD) = 36.50(7.23)/30.63(12.87) on a 10-50 scale). The session completion rates were 75%-95%. Two TBRI facilitators observed: engagement in TBRI activities, increased expression of feelings, adoption of strategies for regulating negative emotions and establishing positive communication, and noticeable behavioral changes in youth and caregivers. Three caregiver interviews revealed that TBRI helped understand the complexity of trauma, provided strategies for healthy youth-caregiver relationships, and empowered caregivers to vocalize needs. While acknowledging sufficiency of intervention content, caregivers expressed the desire for more sessions. Session notes and caregiver interviews revealed participants' satisfaction with virtual intervention delivery.
Conclusions: Results demonstrate feasibility of the intervention for engaging JJ-youth and caregivers in a trauma-informed, attachment-based, online prevention intervention for opioid use.

T113. Opioid Overdose and the Implementation of Post-Overdose Public Health-Public Safety Outreach Programs in Massachusetts: An Interrupted Time Series Analysis

Ziming Xuan[*1], Shapei Yan[2], Katherine Waye[2], Scott Formica[3], Traci Green[4], Leo Beletsky[5], David Rosenbloom[1], Sarah Bagley[4], Audrey Lambert[2], Alexander Walley[4]*
[1]Boston University School of Public Health, [2]Boston Medical Center, [3]Social Science Research & Evaluation, [4]Boston University School of Medicine, [5]Northeastern University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research
Aim: Because nonfatal overdose is the leading risk factor for subsequent fatal overdose, engaging overdose survivors presents an opportunity to reduce overdose mortality. Post-overdose outreach programs emerged in Massachusetts between 2015 and 2019 to engage overdose survivors in addiction treatment and harm reduction services. We aimed to evaluate the association of the implementation of these programs with overdose mortality.
Methods: We conducted a multi-site interrupted time series analysis with data from 26 calendar-quarters (2013 full year to the first half of 2019) across 93 municipalities to assess changes in opioid overdose death rates after the program implementations, controlling for pre-implementation trends and community-level factors. These 93 towns were selected based on a threshold of 30 or more opioid overdoses in 2015, and they had various program inceptions during the study period. The main outcome measure was opioid fatality rate per 100,000 population. We employed log-linear Poisson models adjusting for clustering of the repeated outcome measures and overdispersion of count data.
Results: Post-overdose programs were implemented in 58 communities (62%). Following implementation of the post-overdose programs, we did not detect immediate change in the level of opioid fatality rate following the programs. However, we observed a significant and persistent reduction in the time trend of opioid fatality rate, a 7.4% annual decrease (e.g., beta=-0.019, 1.9% reduction per quarter, p-value=0.001), compared to the time trends before the outreach programs. This trend reduction remained after sensitivity analyses further adjusting for community level fixed effects (p-value=0.02) and in models using rate ratio between overdose death rates over cancer death rate to account for changes in health care system (p-value=0.02).
Conclusions: Community post-overdose outreach programs may contribute to reducing overdose fatality rates over time. Program components, including the types of services delivered, cross-sectoral partnerships, and operational best practices, warrant further evaluation for enhancing program effectiveness.

Virtual Poster Q&A Session II: Polydrug

T114. The Associations of Psychedelic Experiences and Other Substance Use Among People of Color With a History of Racial Trauma

Angela Haeny[*1], Joel Lopez[2], Pamela Colón Grigas[2], Maria Crouch[1], Monnica Williams[3], Alan K. Davis[4]*

[1]Yale University School of Medicine, [2]University of Connecticut, [3]University of Ottawa, [4]The Ohio State University
Abstract Detail Human
Select Drug Category Psychedelics
Topic Racial/Ethnic Differences
Abstract Category Original Research
Aim: Prior research suggests that psychedelic experiences contribute to a reduction in racial trauma and other mental health symptoms among Black, Indigenous, and People of Color (BIPOC) following experiences of racism. We investigated whether psychedelic use among BIPOC following experiences of racism effects other substance use.
Methods: Data were collected through an online survey of 313 BIPOC participants in the U.S. and Canada (32% Black, 29% Asian, 18% American Indian/Indigenous Canadian, 21% Native Hawaiian/Pacific Islander; 57% female; mean age = 33.1, SD = 11.2). Changes in substance use (AUDIT and DUDIT) were assessed by retrospective report 30 days before and after an experience of psychedelic use (psilocybin, lysergic acid diethylamide [LSD], or 3,4-methylenedioxymethamphetamine [MDMA]).
Results: Results showed a small-to-moderate significant reduction in alcohol use from before to after the psychedelic experience ($p < .0001$, $d = .34$). There was a decrease in drug use from before to after the psychedelic experience, but it did not reach the level of significance ($p = .12$, $d = .06$). Significant associations were found between intensity of acute psychedelic effects and changes in alcohol use. Specifically, greater intensity of acute mystical ($r = -.19$, $p = .001$) and insight experiences ($r = -.17$, $p = .002$) were associated with decreased alcohol use.
Conclusions: These findings suggest that psychedelic experiences, specifically acute mystical and insight experiences, may contribute to reductions in alcohol use among BIPOC who report racial trauma. BIPOC have been largely excluded from psychedelic treatment research even though psychedelic use is considered a traditional healing practice in many communities of color. Future research is needed to replicate these findings in a longitudinal study of BIPOC.

T115. Organizational Leaders Perceptions of Barriers to Accessing Behavioral Health Services in a Low-Resource Community

Barrett Montgomery[*1], Leah Maschino[1], Julia Felton[1], Kristen Young[2], Debra Furr-Holden[1], Sarah Stoddard[3]*
[1]Michigan State University, [2]Flint Odyssey House, [3]University of Michigan
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Health Services
Abstract Category Original Research
Aim: Little is known about how to effectively implement behavioral health services in low-resource communities. We sought to understand the barriers to implementing and accessing behavioral health prevention and treatment services from the organizational perspective.
Methods: Leaders from 20 community-serving behavioral health organizations in Flint, Michigan were asked about their organizations and the barriers that they, and the populations they serve, face in providing and accessing behavioral health services. Barriers are reported using a mixed-methods analysis, reporting the number and percentage of organizations that experienced the barrier along with example quotations from the organization leaders.
Results: The most frequently reported barrier to providing services was finding adequate funding (50%), followed by competing programs (25%), inadequate infrastructure (25%), policy barriers (25%), and concerns over sustainability (25%). The most frequently reported barrier for accessing services was finding adequate and reliable transportation (30%), followed by competing priorities (25%), stigma (20%), policy (15%), and trust (15%).
Conclusions: Comparisons of these findings with barriers reported by providers in different settings and those seeking services are discussed. These comparisons may provide an important next step in identifying areas where providers perceptions and the needs of the population are misaligned and for systemic improvements more broadly.

T116. Timing of Therapy Sessions Predicts Daily Substance Use During Treatment

Bryan Benitez[*1], Kathleen Carroll[1], Brian Kiluk[1]*

[1]*Yale University School of Medicine*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: Substance use disorder (SUD) clinical trial research typically evaluates substance use outcomes as weekly aggregates. However, examining temporally dynamic daily substance use patterns can inform both addiction theory and clinical application. Treatment mechanisms should be most salient in memory immediately before and after a therapy session due to predictive processing and cognitive recency effects. Therefore, we hypothesized that substance use would be less likely in the days immediately before and after a treatment session.
Methods: We tested our hypothesis in a secondary data analysis of a randomized clinical trial comparing computer-delivered CBT (CBT4CBT) or clinician-delivered CBT to treatment as usual in an outpatient treatment-seeking sample (Kiluk et al., 2018; n = 83, 72% male, primary drug: 47% marijuana, 34% cocaine, 19% alcohol). Substance use was measured using a weekly timeline follow-back calendar and corroborated with urine toxicology. The relationship between substance use and days after a therapy session was modelled using Bayesian multilevel logistic models.
Results: Days after a therapy session showed a negative quadratic relationship with substance use: risk of substance use initially increased in the days immediately after a session (b = 7.10, BF10 = 35) and also decreased immediately before the next session (b = -7.68, BF10 = 55). This relationship was moderated by treatment condition, but not by SUD severity or primary drug type.
Conclusions: Our findings suggest that substance use motivation changes daily in synchrony with the delivery of psychosocial treatment mechanisms, consistent with predictive processing theories and cognitive recency effects. SUD treatment may benefit from further exploration of the temporal dynamics of daily or hourly substance use motivation during the course of treatment.

T117. Lifetime Trauma Exposure Profiles Relate to Differential Risk for Substance Use Among Reserve and National Guard Soldiers

Bonnie Vest[*1], Nomi S. Weiss-Laxer[1], D. Lynn Homish[1], Gregory G. Homish[1]*
[1]*State University of New York at Buffalo*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: Cumulative trauma increases risk for substance use. Less is known about how types of trauma may differentially relate to risk. This study examined characteristics of lifetime civilian and military service-related trauma among male Reserve and National Guard (R/NG) soldiers, and associations between trauma exposure profiles and substance use.
Methods: Data were drawn from the baseline assessment of Operation: SAFETY, a longitudinal study of R/NG soldiers and their spouses (n=387 male soldiers). Latent profile analyses (LPA) differentiated trauma exposure profiles based on 12 validated measures of trauma including: childhood maltreatment, traumatic life experiences (e.g., fire/natural disaster, injury), combat exposure, and intimate partner violence (IPV; e.g., physical, emotional). LPA models were adjusted to include age as a covariate and the association of current substance use (drug use, alcohol problems, and tobacco use) and class membership with multinomial logistic regression.
Results: LPA identified four trauma profiles among male R/NG soldiers: 1) Low trauma (53%; n=205); 2) Situational trauma (e.g., fire, disasters, combat; 28%; n=107); 3) Childhood trauma (6%; n=22); and 4) Relational trauma (IPV; 14%; n=53). In adjusted regression models, trauma class membership was related to increased odds of substance use; soldiers with current substance use had higher odds of belonging to the Childhood trauma profile compared to the Low profile, for both current drug use (OR: 1.31, p<.05) and alcohol problems (OR: 1.32, p<.05). Membership in the other trauma profiles was not associated with current substance use.
Conclusions: Approximately half of male soldiers experienced high levels of trauma; childhood trauma may be particularly problematic for drug use and alcohol problems. Examining trauma profiles beyond combat exposure may help elucidate why certain soldiers are more likely to experience problems with substance use. Unit leadership and healthcare providers should consider more global assessments of trauma exposure to help identify those at higher risk.

T118. The Effects of Adolescent Intermittent Alcohol Exposure on Voluntary Adult Alcohol Intake and Co-Use of Alcohol and Nicotine

Cassie Chandler[*1], Koby Shaykin[1], Kimberly Nixon[2], Michael Bardo[1]*
[1]University of Kentucky, [2]University of Texas

Abstract Detail Animal Study
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavior
Abstract Category Original Research

Aim: Initiating alcohol use during adolescence increases the likelihood of developing adult substance use disorders. This study tested the hypothesis that adolescent ethanol (EtOH) exposure increases adult alcohol intake and/or alcohol and nicotine co-use by utilizing 2 distinct methods of adolescent exposure, namely voluntary intake and experimenter-delivered exposure.
Methods: In Experiment 1, single-housed, adolescent male Sprague-Dawley rats (n=36) received one water bottle and one bottle containing 20% EtOH, 0.2% saccharin, 0.2% saccharin/20% EtOH, or water, in an intermittent 2-bottle choice. In adulthood, a 2-bottle choice (water vs. 20% EtOH) was available in the same intermittent pattern. In Experiment 2, adolescent male rats (n=12) received an i.p. injection (saline or 2 g/kg, 20% EtOH) intermittently. Adults underwent a 2-bottle choice (0.2% saccharin/15% EtOH vs. water), before training to self-administer nicotine i.v. (0.03 mg/kg/infusion), alongside the 2-bottle choice.
Results: In Experiment 1, exposure to 20% EtOH or 0.2% saccharin during adolescence decreased adult 20% EtOH intake ($F(3, 56) = 7.018$, $p=0.0004$). Similarly, in Experiment 2, rats exposed to EtOH injections during adolescence consumed less EtOH during the initial adult 2-bottle choice ($t(18) = 3.286$, $p = 0.0041$). During co-use, nicotine intake decreased $F(3.82, 34.38) = 36.77$, $p <0.0001$), while EtOH consumption increased ($F(3.628, 32.65) = 15.84$, $p <0.0001$) as the FR value for nicotine increased, though no group differences were found.
Conclusions: Voluntary and forced adolescent EtOH exposure resulted in less adult EtOH intake in the 2-bottle choice. This effect appears to be specific for alcohol and does not generalize to concomitant or alternative reinforcers like nicotine. These preclinical results are inconsistent with the clinical evidence that adolescent alcohol exposure increases the risk for substance use disorders in adulthood, suggesting that factors other than merely alcohol exposure may play a role in explaining the clinical data.

T119. Treatment Engagement in Smartphone-Enhanced Vs. Standard Behavioral Activation for Substance Use

Catherine Paquette[*1], Elizabeth Wilson[1], Dillon Rubalcava[1], Ashley Orshoski[1], Yun Chen[1], Alexander Vierling[1], Stacey Daughters[1]*
[1]University of North Carolina at Chapel Hill

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research

Aim: Low engagement in group-based substance use treatment may contribute to poor post-treatment outcomes. There is some evidence that smartphone-based interventions may be associated with greater homework completion and treatment engagement. However, despite increasing use of smartphone technology in mental health treatment, data comparing engagement in smartphone-enhanced vs. traditional paper-based interventions is lacking. In the context of a behavioral activation for substance use treatment (LETS ACT), the current study tested the use of a smartphone app, compared to paper and pencil treatment materials, on multiple indicators of treatment engagement: 1) treatment attendance, 2) in-session participation, 3) in-session comprehension, 4) working alliance, and 5) use of treatment materials during and after treatment. It was expected that participants in the smartphone condition would demonstrate higher rates of engagement across all outcomes.
Methods: Adults seeking intensive outpatient substance use treatment (N=112) [mean age 41.54±11.26; 36.6% female; 55.4% White/Caucasian, 34.8% Black/African American] were randomized to LETS ACT (n=56) or smartphone-enhanced LETS ACT (n=56).
Results: Generalized estimating equations indicated that use of treatment materials for planning and completing activities decreased significantly over time in both conditions ($p<.001$); participants demonstrated lower

probability of planning and completing activities during (but not after) treatment using smartphones compared to paper treatment booklets (p=.004). Treatment condition did not significantly predict attendance (p=.117), participation (p=.716), comprehension (p=.480), or working alliance (p=.362).
Conclusions: Hypothesized benefits of smartphone technology for increasing engagement were not realized in the current study. Design decisions to streamline smartphone integration into treatment are discussed.

T120. Assessing Anti-Psychotic Use Patterns: Nearly 90% of Current Anti-Psychotic Medication Users in College Report Polypharmacy in 2018-2019

Carolin Hoeflich[1], Sara Nutley[1], Marcia Morris[1], Catherine Striley[1]*
[1]*University of Florida*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: Polysubstance use may increase risk for psychotropic medication misuse or adverse medical consequences due to unintended drug-to-drug interactions. Thus, the present study assessed temporal trends to identify prevalence of polypharmacy, non-medical use, and frequency of medication-related discussions among current anti-psychotic medication users in college.
Methods: Cross-sectional Healthy Minds data was utilized to examine trends in behaviors which may increase risk for anti-psychotic misuse or harmful health outcomes among 1,187 anti-psychotic users (weighted n=1,393) in a sample of 291,090 total survey responses (weighted n = 315,830). Prevalence of current anti-psychotic medication use between 2007-2019 was assessed. Among current anti-psychotic users, Pearson's chi-square tests were conducted to compare rates of polypharmacy, non-prescribed anti-psychotic use, and frequency of medication-related discussions (< 3 vs. ≥ 3 conversations) with healthcare providers in 2007 and in 2018-2019.
Results: Between 2007-2019, 0.44% of students endorsed current use of anti-psychotic medications. The prevalence of current anti-psychotic users who currently take more than one class of psychiatric medication significantly rose, from 59.4% in 2007 to 87.9% in 2018-2019 (p=0.008). In 2018-2019, 15.9% of current anti-psychotic users reported fewer than 3 medication-related discussions with a medical provider. This is a reduction compared to the fourth (24.3%) of current anti-psychotic users who endorsed this item in 2007 (p=0.45). Similarly, the proportion of students who currently take anti-psychotic medications without a prescription decreased over the past decade (12.2% in 2007 vs. 3.7% in 2018-2019; p=0.22).
Conclusions: These findings suggest that treating psychosis among college populations is increasingly complex. However, the recent upsurge of students engaging in adaptive help-seeking behaviors could indicate a rising acceptability in taking a proactive approach regarding one's mental wellbeing. Thus, further work is urgently needed to distinguish current anti-psychotic medication users who are at a greater risk for detrimental medical and/or psychiatric health outcomes.

T121. Telepsychiatry, Social Isolation & Coping Strategies Among Rural Patients During COVID-19

Erin Winstanley[1], Ashley Six-Workman[1], Kari Beth Law[1], Laura Lander[1], Wanhong Zheng[1], James Berry[1]*
[1]*West Virginia University*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: Patients with behavioral health (BH) disorders are more vulnerable to the negative consequences associated with social isolation and recent preliminary data suggests that drug use and overdoses have increased during the COVID-19 pandemic. There is very limited empirical data on telepsychiatry in rural Appalachia. Telepsychiatry, during the pandemic, may mitigate negative coping strategies and social isolation. The purpose of this study is to assess use and satisfaction with telepsychiatry, coping strategies and social isolation during the pandemic.
Methods: An anonymous web-based survey was sent using Epic's MyChart® application. Respondents were receiving treatment from a behavioral health treatment program, that serves approximately 4,000 outpatients annually, located in rural Appalachia. Patients were eligible to participate in the survey if they had a MyChart® account, allowed the program to contact them via MyChart® and had at least one visit after March 21, 2020. The

survey included questions on sociodemographic characteristics; access to web-enabled devices and Internet; use, satisfaction and concerns regarding telepsychiatry; the CDC's recommended questions on COVID-19 coping strategies and the Social Network Index.
Results: Preliminary survey results (n=375) found that 95% had a cell phone, 88% used telepsychiatry during the pandemic and prior to the pandemic only 22% had ever used telehealth services. The majority (91.2%) reported that their telepsychiatry care was good or excellent, 90.6% reported that telepsychiatry helped them deal more effectively with their problems and 37% said they preferred in-person visits. Few reported using negative coping strategies during the pandemic. Only 27.5% reported having been tested for COVID-19 (4 tested positive) and most (63.9%) reported feeling isolated during the pandemic.
Conclusions: Telepsychiatry is critical to helping patients maintain their recovery during the pandemic and to expanding access to services in rural areas. Prospective research is needed to determine whether continued engagement in telepsychiatry helps patients cope with social isolation.

T122. Adults who Report Marijuana Use in the Past Month Have More Negative Perceptions of Their Neighborhood

Fatumastar Adan[*1], Jeremiah Bertz[1], Landhing Moran[2], Leigh Panlilio[1], Sara Hertzel[1], Kenzie Preston[1], Karran Phillips[3]*
[1]NIDA, Intramural Research Program, [2]NIDA, Center for Clinical Trials Network, [3]NIDA, National Institutes of Health
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Other
Abstract Category Original Research
Aim: Previous research has shown that people who use marijuana have more negative perceptions of their neighborhood than those who do not. Many of those studies were conducted with adolescents or young adults. We examined several kinds of neighborhood perception in a community sample of adults including people who use different drugs. We hypothesized that drug use would be associated with more negative neighborhood perceptions.
Methods: 451 participants (n = 188 women, n = 263 men; mean [sd] age = 36.6 [11.5] years) from Baltimore, MD, USA completed the measures used in these analyses. All participants completed the Perceived Neighborhood Scale (PNS) and self-reported past-month use of cigarettes (use n = 265), alcohol (use n = 267), marijuana (use n = 147), heroin (use n = 103), and cocaine (use n = 90). The PNS contains four subscales—social embeddedness (SE), sense of community (SC), satisfaction with neighborhood (SN), and perceived crime (PC)—with higher scores indicating more negative perceptions. For each drug, ANCOVA, including demographics and indicators of socioeconomic status, was used to examine differences among the PNS subscales between those reporting use vs. no use.
Results: There were significant subscale by use interactions for cigarettes and marijuana. People with past-month marijuana use reported significantly higher scores on SN ($t[440] = 2.68$, $p = .022$, $d = .26$) and PC ($t[440] = 2.84$, $p = .013$, $d = .27$) subscales. There were no significant pairwise differences in subscale scores for past month use of cigarettes, alcohol, cocaine, or heroin.
Conclusions: Consistent with previous research in adolescents/young adults, our adult participants with past-month marijuana use had more negative neighborhood perceptions: decreased satisfaction and increased perceptions of crime. People who use different substances may vary in how they perceive their neighborhood. Our future work will include objective neighborhood and drug use measures.

T123. Coping With COVID-19: The Impact of the Pandemic on U.S. Veteran Mental Health and Substance Use

Jill Granoff[*1], Monique Cano[1], Nicole Khauli[2], Amie Haas[2], Steven Batki[1], David Pennington[1]*
[1]UCSF and San Francisco VA Medical Center, [2]Palo Alto University
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Substance Use Disorder
Abstract Category Original Research
Aim: The emergence of COVID-19 has coincided with increased reports of anxiety, depression, and substance use in the U.S., but less is known about the pandemic's specific impact on U.S. veterans. We sought to explore rates of

alcohol and/or other substance use disorder (ASUD) among veterans since the pandemic emerged on March 11, 2020. We also examined if veterans with ASUD would report greater amounts of anxiety and depression symptoms, engagement with avoidant coping strategies, and COVID-related impact and distress compared to veterans without ASUD.
Methods: We surveyed 397 veterans (M age = 46.79 ± 13.77; 77% male; 88% non-Hispanic; 87% White) between October to November of 2020. Veterans completed demographic questionnaires, self-report measures of coping, anxiety and depression symptoms (i.e., Brief COPE, PHQ-4), and items about the pandemic's impact on functioning and distress. Veterans were categorized into ASUD positive and ASUD negative groups based on whether they met cut-off scores for probable dependence on alcohol, cannabis, and other substances (AUDIT-10, CUDIT-R, and DUDIT, respectively). Four one-way ANOVAs were conducted to examine ASUD group differences on anxiety and depression symptoms, avoidant coping, and COVID-19 impact and distress.
Results: Approximately 35% (n=138) of the veterans surveyed met criteria for ASUD. Veterans with ASUD reported significantly higher anxiety and depression symptoms, greater engagement with avoidant coping strategies, and higher levels of impact and distress due to the COVID-19 pandemic than veterans without ASUD (all $p<.001$).
Conclusions: Veterans in this study had considerably higher rates of ASUD than past year or lifetime rates in the general population (1-10%). This study provides novel insight into the disproportionate impact and distress of COVID-19 on mental health among veterans coping with alcohol and substance-related problems. Results highlight the need for the Department of Veterans Affairs to outreach and address veteran ASUD issues in the context of coping with COVID-19.

T124. Changes in Harm Reduction and Substance Use Service Utilization From Modified Income Assistance Payments: Evidence From an Experimental Study

Kaye Robinson[*1], JinCheol Choi[2], Lindsey Richardson[2]*
[1]Providence Health Care, [2]University of British Columbia, BC Centre on Substance Use
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Health Services
Abstract Category Original Research
Aim: Synchronized monthly government income assistance (IA) payments are linked to intensified drug use and associated harms, including disrupted access to harm reduction and substance use services intending to mitigate these harms. This study evaluates how alterative IA distribution schedules impact harm reduction (HR) and substance use (SU) service utilization.
Methods: This exploratory, parallel group, unblinded, randomised controlled trial enrolled adults (n=192) in Vancouver, Canada receiving provincial IA, and reporting active, regular illicit drug use, that intensified surrounding IA payments. Participants were randomly assigned on a 1:2:2 basis for six IA payment cycles to: (1) existing government schedules (control); or one of two interventions with desynchronized schedules: (2a) 'staggered' single monthly payment; or (2b) 'split & staggered' twice-monthly payments. Generalised linear mixed models were used to analyze a priori secondary outcomes of harm reduction and substance use service (1) utilization; (2) barriers to access; (3) barriers around government payments; and (4) barriers around individual payments.
Results: Forty-five control, 72 staggered, and 77 split & staggered volunteers participated between October 2015 - January 2018. Select bivariate analyses demonstrate increased overall barriers to HR (Odds Ratio [OR]=2.04, 95% Confidence Interval [CI]; 1.24-3.36) but reduced barriers to HR around individual payments in the split & staggered arm (OR=.06, 95% CI; .01-.55). Similarly contrasting results indicate increased access (OR=1.82, 95% CI; 1.17-2.81) but also increased barriers (OR=2.08, 95% CI; 1.10-3.95) to SU services among split & staggered participants.
Conclusions: Preliminary results suggest complex impacts of this structural intervention on HR and SU service utilization. Previously demonstrated reductions in drug use may increase attempts to utilize HR/SU services, potentially increasing overall access as well as barriers to services. We additionally observed important reductions in accessing HR services coinciding with individual payments, potentially reflecting redistributed demand for HR services away from government payment days.

T125. Drug Use Without Addictioning People With a "Stake in Conventional Life: A Classic Ethnographic Idea Examined in Nationwide Crowdsourced Data

Kirsten Smith[*1], David Epstein[1], Jeffrey Rogers[1], Justin Strickland[2]*
[1]National Institute on Drug Abuse, Intramural Research Program, [2]Johns Hopkins University School of Medicine

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavior
Abstract Category Original Research

Aim: To pilot questions assessing how drug-using people are vested in their everyday life, perceived opportunity costs of use, and motivated change. Prior work in this area has been largely ethnographic, in geographically limited samples. We used a self-selected but large, diverse, and nationwide online sample.
Methods: Using Amazon Mechanical Turk, US adults were recruited into two substance-using groups representing different expected degrees of stigma and potential for marginalization: past 6-month alcohol only, and opioid and/or stimulant use (other use permitted). The design was cross-sectional, but the survey included opportunities to report temporal transitions and perceptions of cause and effect.
Results: 1,670 surveys were completed between September-December 2020. Among the final evaluable sample (N=1,510: 770 alcohol, 740 opioid/stimulant), DSM-5 SUD criteria were met by 39.9% of drinkers and 79.8% of opioid/stimulant users. Sample-wide, items indicating the concept of a "stake in conventional life" were widely endorsed as reasons for self-imposed ceilings on amount of use. These included health (59.4%), important everyday roles (55.3%), avoiding legal trouble (53.0%), deriving pleasure from nondrug sources (48.0-54.0%), social functioning (49.4%), and hope for the future (36.5%). Distribution of SUD severity was: none=40.5%, mild=17.4%, moderate=13.0%, severe=29.1%. Even respondents with severe SUDs reported everyday life roles and interests that were more meaningful and important than using, but at lower rates ($p<.001$), with higher rates of motivations to modify use pertaining to cost (35.3%), time (18.9%), effort (25.1%), diminished social standing (27.8%), and family-work obligations (48.3%-49.2%). All SUD groups reported positive, negative, or no changes in quality of life, relationship, and opportunities since initiating use. Severe SUDs were associated with greater drug-related suffering, sometimes alongside reports of drug-related benefits.
Conclusions: Complex accounts of putative protective factors in drug use, traditionally assessed in small, qualitative studies, can be examined in large online samples in ways that will ultimately permit more generalizable conclusions.

T126. Methodology for Extracting Electronic Health Record (EHR) Data Across Diverse Health Systems for Analysis of Patient-Level Impacts of Substance Use Screening in Primary Care

Leah Hamilton[*1], Aimee Wahle[2], Keith Goldfeld[1], Sarah Farkas[1], Seth Pitts[2], Margaret Kline[2], Noa Appleton[1], Jennifer McNeely[1]*
[1]New York University School of Medicine, [2]The Emmes Corporation

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Health Services
Abstract Category Original Research

Aim: Electronic health record (EHR) data can increase our understanding of primary care patients' substance use prevalence, comorbidities, and health care utilization. As part of an implementation feasibility study of EHR-integrated substance use screening in three health systems, we sought to use EHR data to illuminate patient-level outcomes. Record abstraction across diverse health systems' EHRs poses substantial challenges, particularly in the absence of a common data model. Thus, we present a process of data extraction of study-developed measures and existing patient data, based on our experience building a unified dataset for this study.
Methods: Data extracts were developed for primary care patients from nine clinics for 1 year prior and 1-2 years following implementation of EHR-integrated substance use screening. Data extracts included information about primary care, hospital, and emergency department visits. Data abstractions were accomplished through a collaborative development process between the research team for the clinical trial, hospital system data managers, and the data coordinating center.
Results: A set of standardized structures and procedures for communication, validation, and iteration were established over the course of the data abstraction process to create a finalized dataset. Successful development of

EHR datasets required weekly core team meetings to refine the hospital systems' extracts guided by consistent reference to and annotating of the data specifications. Validation processes included comparison of patient level data to previous data extracts, front and back-end EHR comparisons with subsamples of patients, and collaborative review of quality control reports. All processes were iterated within each clinic and hospital system, although there was limited translation of data structure specifics across health systems.
Conclusions: Data abstraction of primary care patients' EHR-integrated screening data, primary care and hospitalization data across multiple health systems was feasible, but required teamwork, time, diligent effort, meticulous record keeping, and a thorough multi-layer process of quality control.

T127. Gender-Sensitive Training for Substance Use Disorder Treatment Professionals: Comparing Results and Implications of Two Urban Provinces

Liezille Jacobs[1]*
[1]*Rhodes University*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavior
Abstract Category Original Research
Aim: Queer individuals are at higher risk for substance use disorders (SUDs) than heterosexual individuals. The queer population is also less likely to seek substance use treatment related to the stigma from health practitioners associated with discrimination. The study aimed to explore mental health practitioner training needs in SUD counseling of genderqueer populations.
Methods: Informants were health professionals in SUD practices and from the Gauteng and KwaZulu Natal Provinces in South Africa (3 focus groups in each province; N = 48; females = 90%; black = 85%, 15% = white; psychologists = 70%, social workers = 15%, auxiliary health workers = 15%). Participants completed focus group interviews. This project utilized the qualitative research paradigm of the psychological subject. Thematic analysis was used to analyze the data.
Results: Salient themes from 5 of 6 focus groups were: An explicit need for training related to dealing with stigma towards queer populations and a lack of data capture related to non-binary genders. Participants expressed a need for assistance on how to deal with their own bias and prejudice beliefs about the queer population. They also related that options for non-binary genders are absent from treatment intake forms. Governmental departments tasked with SUD treatment instruct mental health practitioners to enter data that exclude non-binary populations. One study site in the Gauteng province reported that they did not discriminate against gender therefore they do not need training on how to treat genderqueer clients.
Conclusions: This study identified individual-and system-level needs and barriers related to training in counseling of queer populations in the SUD setting in South Africa.

T128. Health Impacts of a Scale-Up of Supervised Consumption Services in a Canadian Setting: An Interrupted Time Series Analysis

Mary Clare Kennedy[1]*, *Kanna Hayashi*[2], *M-J Milloy*[3], *Miranda Compton*[4], *Thomas Kerr*[3]
[1]*The University of British Columbia,* [2]*Simon Fraser University,* [3]*British Columbia Centre on Substance Use,* [4]*Vancouver Coastal Health*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Harm Reduction
Abstract Category Original Research
Aim: In response to a public health emergency characterized by a dramatic rise in overdose deaths, there was a rapid scale-up of low-threshold supervised injection services (SIS) in Vancouver, Canada in December 2016. We evaluated the potential impact of this SIS expansion on patterns of service use, drug-related risks and engagement with addiction treatment among people who inject drugs (PWID).
Methods: Data were drawn from two community-recruited prospective cohorts of PWID in Vancouver. We conducted segmented regression analyses of interrupted time series data from January 2015 to November 2018 to examine the impact of the SIS expansion on immediate (i.e., level) and gradual (i.e., slope) changes in the monthly prevalence of self-reported recent SIS use, public injection, syringe sharing and participation in addiction treatment, controlling for pre-existing secular trends.

Results: In total, 745 PWID were included in the study, including 292 (39.7%) women. The median age of study participants was 47 years (interquartile range: 38, 53) at baseline. Post SIS expansion, the monthly prevalence of SIS use immediately increased by an estimated 6.4% (95% confidence interval [CI]: 1.7, 11.2) and subsequently further increased by an estimated 0.7% (95% CI: 0.3, 1.1) per month. The monthly prevalence of participation in addiction treatment immediately increased by an estimated 4.5% (95% CI: 0.5, 8.5) following the SIS expansion, while public injection and syringe sharing were estimated to immediately decrease by 5.6% (95% CI: 1.0, 10.1) and 2.4% (95% CI: 0.4, 4.5), respectively (all $p<0.05$). No subsequent gradual changes in public injection, syringe sharing, or addiction treatment participation were observed.
Conclusions: These findings suggest that scaling up SIS was an effective strategy to promote service engagement and extend the health benefits of SIS.

T129. Emotions Produced by First Substance Exposure are Associated With Future Problematic Use

Neil Varshneya[*1], Kelly Dunn[1], Andrew Huhn[1], Cecilia Bergeria[1]*
[1]Johns Hopkins University School of Medicine
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Substance Use Disorder
Abstract Category Original Research
Aim: The emotional experience produced by first exposure to a substance may influence individual motivation for continued use of that substance. This study analyzed survey data on the relationship between emotions produced by an individual's first exposure to a given substance and the presence and severity of a substance use disorder (SUD) for that substance at the time of survey completion.
Methods: Four hundred and ninety-eight respondents whose first substance exposure was either alcohol or cannabis completed an online, mTurk survey and met inclusion criteria for data analysis. Respondents indicated which of 32 different emotional reactions (17 positive, 15 negative) they experienced in response to their first exposure. Multiple linear regression (least squares) was used to assess whether emotions at the time of first use were associated with current DSM-5 severity for their respective first substance (alcohol or cannabis).
Results: Significant associations were observed for the following four emotion variables (2 positive, 2 negative) and increased DSM-5 severity categories: energetic ($\beta = 0.3059$, $p = 0.0099$), sympathetic ($\beta = 0.3228$, $p = 0.0060$), weak ($\beta = 0.5070$, $p = 0.0012$), irritable, ($\beta = 0.7371$, $p < 0.0001$).
Conclusions: These results suggest that the emotional experience produced by the first exposure to a given substance may predict the development and/or severity of substance misuse and SUDs. To our knowledge these data are the first to examine this association. These findings are consistent with anecdotal reports that persons with SUD feel energized by the use of substances whereas persons without SUD do not report experiencing such emotions upon first use. Future work is needed to understand whether an emotional phenotype associated with substance use initiation can be used to predict the development and severity of SUDs.

T130. "You Need Money to Get High, and That's the Easiest and Fastest Way to Make Money": A Typology of Sex Work and Health Behaviors Among People Who Inject Drugs

Shannon Ogden[*1], Miriam Harris[2], Ellen Childs[3], Pablo Valente[4], Alberto Edeza[4], Alexandra Collins[4], Mari-Lynn Drainoni[1], Matthew Mimiaga[5], Katie Biello[4], Angela Bazzi[1]*
[1]Boston University School of Public Health, [2]Boston University School of Medicine and Boston Medical Center, [3]Abt Associates, [4]Brown University School of Public Health, [5]UCLA Center for LGBTQ Advocacy
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavior
Abstract Category Original Research
Aim: People who inject drugs (PWID) who engage in sex work experience many structural-level barriers to accessing health services; however, there is limited data on the reasons why PWID engage in sex work in the U.S. Northeast, where elevated rates of overdose and HIV transmission occur among PWID. We aimed to create a sex work typology based on perspectives of PWID on their sex work engagement, HIV risk, and healthcare utilization behaviors.

Methods: We drew from qualitative research conducted across Massachusetts and Rhode Island from 2016-2019. Participants were ≥18 years old and self-reported past-month injection drug use and HIV-negative status. Analysis of data from those reporting any sex work experience (n=33/78) contributed to a typology of participants' perspectives on sex work engagement and attributes pertaining to HIV risk and healthcare utilization behaviors.
Results: Among the 33 participants, median age was 38 years and the majority identified as white (76%), female (55%), and had at least a high school education (85%). About half identified as heterosexual (52%) and over a third (36%) as bisexual. Based on participant perceptions of sex work, a typology comprised of three groups emerged, depicting their engagement as a (1) consistent job, (2) source of "easy money," or (3) last resort. The latter group appeared particularly vulnerable to HIV, describing inconsistent condom use, sharing of injection equipment driven by withdrawal symptoms, low healthcare utilization, and limited disclosure of sex work or injection behaviors to healthcare providers.
Conclusions: Findings highlight distinct perspectives on sex work among PWID and associated patterns of HIV risk and healthcare utilization behaviors. Understanding the nuances in sex work engagement among PWID can inform interventions to prevent infectious disease transmission, including fostering cross-sector collaborations between community-based organizations and healthcare services to address harm reduction and healthcare needs.

T131. Experiences of Racial Discrimination in the Medical Setting and Associations With Medical Mistrust and Expectations of Care Among Black Patients Seeking Addiction Treatment

Orman Hall[1], Julie Teater[1], Monique McKiever[1], Mikyung Baek[1], Kara Rood[1], Stephanie Garcia[1], Kamilah Dixon-Shambley[1], Ayana Jordan[2], David Fielin[2]*
[1]The Ohio State University, [2]Yale University School of Medicine

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Disparities
Abstract Category Original Research

Aim: Little is known about the prevalence of experiences of healthcare discrimination among Black patients seeking treatment for addiction, or how these experiences might influence Black patients' medical trust or expectations of care when considering addiction treatment. The aim of the present study was to describe experiences of racial discrimination in the medical setting, medical mistrust and expectations of care among Black patients seeking addiction treatment.
Methods: Participants were 143 Black male and female adults recruited consecutively from two university addiction treatment facilities in Columbus, Ohio. All participants completed validated surveys assessing perceptions of prior racial discrimination in the medical setting and group-based medical mistrust. Participants were also asked a series of questions about their expectations of care with regard to racial discrimination and addiction treatment. Descriptive analyses were used to characterize the sample with regard to demographics, perceived discrimination and medical mistrust. Kendall tau-b correlations assessed relationships between discrimination, mistrust and expectations of care.
Results: Seventy-nine percent (n= 113) of participants reported prior experiences of racial discrimination during receipt of healthcare. Racial discrimination in the medical setting was associated with greater mistrust in the medical system ($\tau b = 0.572$, $p < .001$), and worse expectations regarding racial discrimination in addiction treatment ($\tau b = .489$, $p < .001$) including delays in care-seeking due to concern for discrimination ($\tau b = .442$, $p < .001$), projected non-adherence ($\tau b = .318$, $p < .001$) and fears of discrimination-precipitated relapse ($\tau b = .318$, $p < .001$).
Conclusions: Black patients seeking addiction treatment commonly report experiencing racial discrimination by healthcare workers. These prior experiences may be associated with mistrust in the medical system and expectations of discriminatory care during addiction treatment. Strategies to eliminate and mitigate experiences of racial discrimination in the medical setting may improve addiction treatment receptivity and engagement.

T132. Prep Care Continuum Engagement Among Persons Who Inject Drugs: Rural and Urban Differences

Suzan Walters[1], Jerel Ezell[2], David Frank[1], Brent Van Ham[3], Valerie Earnshaw[4], John Schneider[5], Samuel Friedman[6], Danielle Ompad[7]*

[1]New York University, [2]Cornell University, [3]Southern Illinois University, [4]University of Delaware, [5]University of Chicago, [6]NYU Medical School, [7]New York University College of Global Public Health
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavior
Abstract Category Original Research
Aim: People who inject drugs (PWID) are at risk for HIV due to sexual and injection practices. PrEP is a biomedical intervention that can reduce the risk of HIV infection, yet PrEP uptake has been low among PWID. There is limited data on linkage to PrEP among PWID, especially how linkage differs between rural and urban settings.
Methods: We conducted 57 semi-structured qualitative interviews with PWID living in rural and urban settings (18 in rural southern Illinois and 39 in New York City) to explore local feasibility of PrEP in 2019-20 (before COVID-19). Data were analyzed using a grounded theory approach, were thematically sorted using the PrEP care continuum—defined as awareness, knowledge, willingness, and uptake—as a conceptual framework, and then sorted by location.
Results: Urban participants had greater PrEP engagement, including having more PrEP awareness and knowledge. In the rural setting, no participants accurately described PrEP. No participants in either location were taking PrEP at the time of the interview, but about half in each location expressed willingness to use PrEP, preferring long-lasting injectable PrEP to daily pills. Stigma against drug use, HIV and PrEP were identified as barriers to PrEP, particularly in the rural setting. When asked hypothetically about where PWID would prefer to get PrEP, participants identified their local syringe service program (SSP) as a welcoming environment where they would be comfortable receiving PrEP care.
Conclusions: PrEP for PWID appears feasible and would probably be most effective if embedded in organizations such as SSPs that currently serve PWID. Expanding harm reduction services and partnerships with clinical programs and/or prescribers could benefit PWID. Along with PrEP, SSPs may consider providing medications for opioid use disorder as part of the harm reduction toolkit. We suggest that interventions focus on increasing care continuum stages and include stigma mitigation strategies.

T133. Affect Risk Profiles Derived From Intensive Assessment Across Two Days Post-SUD Treatment: Predicting Use Three Months Later

Samuel Stull[1], Michael Dennis[2], Christy Scott[2], Stephanie Lanza[1]*
[1]The Pennsylvania State University, [2]Chestnut Health Systems
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: Patients with substance use disorder (SUD) may have difficulty maintaining SUD remission post-treatment because of particular affective characteristics such as frequent negative moods, infrequent positive moods, chronic pain, fatigue, and cravings. These affective factors may co-exist within individuals to form distinct affective profiles that together may confer risk for substance use post-treatment. We aimed to identify distinct risk profiles at post-treatment and then use these profiles to predict substance use three months later.
Methods: 198 adults who completed SUD treatment (mean age 43.7; 60% male; 69% black) provided five daily assessments for six months post-treatment. Data from the first two days of EMA (approximately 10 assessments per person) were sufficient for capturing affective experiences in daily life; a factor analysis informed the selection of nine affective risk factors included as indicators in latent class analysis (LCA). The following dichotomous indicators were included: low- and high-arousal positive mood, low- and high-arousal negative mood, alert, bored, tired, craving, and pain. The BCH approach for distal outcomes was used to predict the percent of days abstinent in the subsequent three months from risk profiles (i.e., latent classes).
Results: Four risk profiles were identified from EMA in the first two days: Stable Positive Affect (38% of participants), Irritable, Low Positive Affect (35%), Craving, Pain, Stable Positive Affect (15%), and Affect Variety (12%). The Irritable, Low Positive Affect class had significantly fewer days abstinent at three months compared to all other classes. The other classes did not differ significantly from each other in days abstinent.
Conclusions: LCA applied to EMA collected very early upon post-SUD treatment enables the detection of nuanced affective risk profiles, which in turn may predict longer-term SUD outcomes. Individuals with a variety

of negative moods ("irritable") and infrequent positive moods may be at greatest risk for substance use post-treatment.

T134. A Systematic Review of Electronic and Telecommunication Technology Interventions to Address Substance, Alcohol, and Tobacco Misuse in Women

Yukiko Washio[1], Yusuke Hayashi[2], Sravanthi Atreyapurapu[3], Katie Chang[4], Tony Ma[4], Felicia Browne[1], Wendee Wechsberg[1]*
[1]RTI International, [2]Pennsylvania State University, [3]None, [4]Benten Technologies

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Technology (e.g., mHealth)
Abstract Category Literature Review

Aim: Various considerations are required to address substance, alcohol, or tobacco misuse among women, and electronic information and telecommunication technology have become increasingly common to accommodate barriers. This review aims to describe prospectively designed studies that tested technology-based interventions to address substance, alcohol, or tobacco misuse among women.
Methods (Optional): The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were used to conduct the systematic review. Four databases (PubMed, Web of Science, PsycINFO, and Scopus) were used for the search and peer-reviewed articles published in English between oldest dates and June 7, 2019 that employed computer-based, mobile, or other electric technology to address substance, alcohol, or tobacco misuse among women were included in the search. The risk of bias was examined using the Grading of Recommendations, Assessment, Development, and Evaluation approach.
Results (Optional): A total of 566 unique titles were identified, with 28 articles selected after the final full-text review from the U.S., England, Japan, and the Netherlands. The types of technology used in the interventions included computer software (standalone or web-based), mobile applications, phone, and text messaging. Intervention outcomes included substance and alcohol misuse (n = 5), smoking cessation (n = 9), substance misuse only (n = 5), and alcohol use reduction only (n = 9). The populations reached included underserved, pregnant (n = 11), postpartum (n = 4), and non-pregnant women (n = 14) ranging from adolescent to adulthood. Interventions that targeted both substance and alcohol misuse showed statistically significant reductions (i.e., $p < .05$-$.0001$). Non-randomized trials led to the serious risk of bias for studies on smoking cessation and alcohol use reduction and small sample sizes led to serious imprecision.
Conclusions: While technology-based interventions were effective in reducing substance and alcohol misuse for women, mixed findings were obtained for interventions targeting other outcomes. Technology-based interventions that address substance, alcohol, and tobacco misuse among women should not only target singular substance but also polysubstance misuse.

T135. Baseline Methamphetamine and/or Amphetamine Use and Illicit Opioid Use During Buprenorphine Treatment

Zoe Kratina-Hathaway[1], Andrea C. Radick MPH[2], Zachery A. Schramm BA[2], Kendra L. Blalock MS[2], Brian G. Leroux PhD[2], Theresa Kim MD[3], Judith Tsui MD MPH[2]*
[1]University of Washington School of Medicine, [2]University of Washington, [3]Boston University School of Medicine and Boston Medical Center

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research

Aim: Although methamphetamine use is rising in the U.S., its impacts on outcomes among persons with treated opioid use disorder (OUD) remain unclear. This study aims to assess an association between baseline methamphetamine/amphetamine (MA/A) use and subsequent risk of illicit opioid use among OUD patients initiating buprenorphine in an office-based setting.
Methods: Secondary analysis of a pilot randomized controlled trial of a behavioral mHealth intervention for buprenorphine adherence conducted over a 12-week study period at two clinic sites. Baseline MA/A use was identified by urine drug tests (UDT) and/or self-report of past 30-day use. Separate Poisson regression models

with robust standard errors were used to evaluate associations between baseline MA/A and 2 outcomes: i) illicit opioid use at 12 weekly UDT and ii) self-reported past 30-day use at week 12.
Results: At baseline, 28 (36%) of the 78 participants had MA/A use. Baseline methamphetamine use was prospectively associated with an increased risk for testing positive for illicit opioids on UDT during the study period (RR=1.65; 95% CI=1.19-2.29; P=0.002) and an increased risk for reported past 30-day illicit opioid use at week 12 (RR=3.81; 95% CI=1.27-11.40; P=0.017).
Conclusions: In this sample of patients initiating buprenorphine who were enrolled in a randomized trial of a mHealth adherence intervention, methamphetamine and/or amphetamine use at baseline was prospectively associated with illicit opioid use over a 12-week period.

Virtual Poster Q&A Session II: Stimulants

T136. Development and Validation of the Stimulant Refusal Self-Efficacy Questionnaire (SRSEQ) in Stimulant Users Engaged in Treatment

Angela Wanigasooriya[*1], Jason Connor[2], Ross Young[2], Gerald Feeney[2], Matthew Gullo[2]*
[1]The University of Queensland, [2]The University of Queensland; Princess Alexandra Hospital
Abstract Detail Human
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Category Original Research
Aim: There are currently no approved pharmacological agents to treat stimulant use disorder. Psychosocial interventions, including Cognitive Behavioural Therapy (CBT), are recommended as the first-line treatment for stimulant use disorder. The goal of CBT is to increase confidence in the ability to resist stimulants in cued situations through the development of coping strategies, or drug refusal self-efficacy. Currently, there is no validated measure of refusal self-efficacy specific to stimulants. Measurement of refusal self-efficacy is critical as it supports core skills development techniques achieved by CBT and serves as a viable mechanism of change. This study aimed to develop and validate the Stimulant Refusal Self-Efficacy Questionnaire (SRSEQ).
Methods: 207 stimulant users (Amphetamines 56.6%; MDMA/Ecstasy 28.6%; Cocaine 14.8%) attending an alcohol and drug outpatient clinic completed the SRSEQ and measures including stimulant dependence severity. Confirmatory factor analysis (CFA) using structural equation modelling (SEM) was conducted to test the proposed three-factor structure of the SRSEQ and the suitability of included items. Criterion validity was tested using path analysis to examine associations with stimulant dependence severity.
Results: The hypothesised three-factor structure was supported: Emotional Relief, Opportunistic and Social Facilitation refusal self-efficacy. Each of the three subscales were significant unique predictors of stimulant dependence severity, supporting the SRSEQ's criterion validity. While Opportunistic refusal self-efficacy was a relatively weaker predictor ($\beta = -.22$, $p = .021$), its association did not differ significantly (ps > .38) from those of Emotional Relief ($\beta = -.29$, $p = .004$) or Social Facilitation ($\beta = -.31$, $p < .001$).
Conclusions: The SRSEQ is a clinically useful, theoretically rich and valid assessment tool that is associated with stimulant dependence severity. The three-factor structure of stimulant refusal self-efficacy is consistent with that previously identified for alcohol and cannabis. Findings of this study can be used to inform focus in psychosocial treatment for individuals with stimulant dependence.

T137. Impact of the COVID-19 Pandemic on Cocaine Dependent and Healthy Volunteers

Deanna Dong[*1], Kate Brown[1], Carina Chen[1], Kimberly Lake[1], Eduardo Butelman[1]*
[1]The Rockefeller University
Abstract Detail Human
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Category Original Research
Aim: This mixed-method study examined the effects of the COVID-19 pandemic lockdown on physical/mental health, housing, food, relationships, finances, and drug usage patterns in volunteers who previously participated in medical research at Rockefeller University (RU). The clinical groups studied were volunteers with cocaine dependence (CD; by DSM-IV criteria) and normal volunteers (NV).

Methods: 40 (n=20 CD and n=20 NV; mean ages 57.75 and 46.05, respectively) adults from New York City were sequentially interviewed over the phone by nurse practitioners from May to September 2020 until n=20 for each clinical group was obtained. Participants previously provided informed consent under a parent study approved by the RU Hospital IRB. Instruments included a questionnaire developed in lab and 30-Day KMSK scales (dimensional measures of maximal exposure to specific drugs). Participants were previously evaluated with 30-Day KMSK scales at their original interview (mean of 2 years prior; 1.2 years for CD volunteers and 3 years for NVs).
Results: : Since COVID-19 lockdown measures were put in place, CD volunteers reported more negative mood (Mann-Whitney U=114; p=0.045) and greater mood change (Mann-Whitney U=87.5; p=0.0026) compared to NVs, while NVs reported greater difficulties on their ability to obtain income compared to CD volunteers (p=0.029). In the 30 days prior to phone interviews and compared to their respective initial outpatient interviews, CD volunteers' cocaine use decreased (Wilcoxon test; p=0.025) and NVs' alcohol use increased (Wilcoxon test; p=0.038). CD volunteers also reported greater cannabis use (p=0.026) compared to NVs.
Conclusions: Volunteers diagnosed with CD reported more substantial negative mood during the lockdown compared to NVs. By contrast, NVs reported greater problems in maintaining income compared to CD volunteers. This phone survey identifies major themes that may be examined in previously ascertained persons with a CD diagnosis during the COVID-19 lockdown.

T138. Trends and Geographical Differences in Cocaine and Methamphetamine Use Among Pregnant Individuals in Substance Use Disorder Treatment, 2006-2017

Dennis Hand[*1], Vanessa Short[1], Meghan Gannon[1], Kimberly McLaughlin[1], Diane Abatemarco[1]*
[1]Thomas Jefferson University
Abstract Detail Human
Select Drug Category Stimulants
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: To describe changes from 2006-2017 in the prevalence of cocaine and methamphetamine use among pregnant individuals entering substance use disorder (SUD) treatment, identify characteristics and treatment outcomes associated with their use in different geographical regions, and determine changes in these characteristics and outcomes over the last decade.
Methods: Data from the Treatment Episodes Database – Discharges (TEDS-D), restricted to cases noted as pregnant at admission, from 2006-2017 were analyzed (N=254,972). Change in incidence of cocaine and methamphetamine use at admission from 2006-2017 was analyzed using Cochrane-Armitage trend tests nationally and within each US census region. Associations between cocaine and methamphetamine use and demographic characteristics and treatment outcomes by region and year were assessed using Chi-square tests.
Results: Nationally and within each region cocaine use decreased by approximately half between 2006-2017 (36% to 16%, p < .001). Methamphetamine use increased nationally (32% to 37%, p<.001), with rates nearly doubling in 3 of 4 census regions. Cocaine use was associated with older age, co-occurring psychiatric problems, and lower rates of treatment completion in most regions. Methamphetamine use was associated with slightly younger age, and more frequent referral to treatment from criminal justice. Methamphetamine use was associated with lower rates of treatment completion in 2017 than in 2006 in every census region. Treatment completion among those who used cocaine was variable across regions.
Conclusions: Methamphetamine use among pregnant individuals entering SUD treatment increased to over one-third of treatment episodes, doubling in 3 of 4 US census regions and represents a significant public health threat. These data highlight a need for SUD treatment programs to tailor services to retain pregnant individuals in treatment and provide wrap around support services that will help them engage and remain in recovery.

T139. Predictors of Transactional Sex Engagement Among Adults Seeking Treatment for Cocaine Use Disorder

Emma Lathan[*1], Judy Hong[1], Angela Heads[1], Joy Schmitz[1]*
[1]The University of Texas Health Science Center at Houston
Abstract Detail Human
Select Drug Category Stimulants

Topic Health Services
Abstract Category Original Research
Aim: Transactional sex engagement places cocaine users at particularly high risk for deleterious health and safety outcomes. A healthcare provider's awareness of a patient's sex work and/or sex purchasing is crucial for appropriate screening, care, and/or referral to risk reduction services. However, little is known about transactional sex engagement, specifically purchasing, among treatment-seeking cocaine users. The current study examined predictors of sex work and sex purchasing among treatment-seeking adults with cocaine use disorder (CUD).
Methods: Participants (n = 109; Mage= 50.0 years, SDage = 7.6 years; 79.8% male; 79.8% Black) were drawn from a clinical trial for CUD in a large southern city. Data were collected upon initial intake. Descriptive and chi-square analyses were conducted to examine transactional sex engagement prevalence rates. Binary logistic regression analyses were used to predict participants' recent engagement in sex work or sex purchasing, with each model entering independent variables in domains related to demographics, drug-use patterns, trauma exposure, and sex practices.
Results: Over 41% of participants endorsed transactional sex engagement within the last 30 days; 20.2% reported providing sex for money and/or drugs, 30.3% reported purchasing sex via money and/or drugs, and 9.2% reported both. Prostitution and sex purchasing rates differed by gender (36.4% of women v. 16.1% men, 4.5% of women v. 36.8% of men, respectively). Regression analysis revealed two distinct models that correctly predicted engagement in sex work or sex purchasing (p's < .001). Prostitution likelihood was predicted by increased number of sexual partners, trauma exposure, concern about contracting HIV, years using cocaine, and drug-related problem days. Sex purchasing likelihood was predicted by male gender and more sexual partners.
Conclusions: Treatment-seeking cocaine users with certain characteristics and experiences may have increased likelihood of transactional sex engagement, and thus, greater need for regular screening, preventive services, and targeted treatment.

T140. Feasibility, Acceptability, and Outcomes of a Contingency Management Program for Stimulant Use Disorder in an Acute Care Setting: A Mixed Methods Pilot Study

Emma Garrod[1], Kaye Robinson[1], M. Eugenia Socias[2], Melissa Nicholson[1], JinCheol Choi[3], Nadia Fairbairn[2]*
[1]Providence Health Care, [2]University of British Columbia, [3]British Columbia Centre on Substance Use

Abstract Detail Human
Select Drug Category Stimulants
Topic Behavior
Abstract Category Original Research
Aim: Contingency management (CM) is effective for the treatment of stimulant use disorder (SUD) in community settings. This pilot study assessed the feasibility and acceptability of a CM intervention for SUD in an acute care setting in Vancouver, Canada.
Methods: Medical inpatients with SUD and at least a two-week anticipated stay were enrolled and engaged in the intervention for up to 12 weeks, consisting of twice-weekly gift card rewards for stimulant-negative urine drug tests (UDT) and for achieving goals. TimeLine Followback assessment and brief surveys gathering data on self-reported stimulant use and patient acceptability were administered weekly and at study completion. Staff surveys were collected to explore program feasibility. Among participants who were in the study for ≥ 14 days, Generalized Linear Mixed Models were used to examine the impact of length of time in the study on changes in stimulant use; the study was not powered to determine effect size.
Results: Forty-two patients were enrolled in the study and twenty-four participants completed > 14 days of the intervention and were included in analysis. Of those, 54% (n=13) had a severe SUD and 83% (n=20) had a concurrent opioid use disorder. Participant responses in weekly surveys indicated that CM led to decreased stimulant use (89%) and improved hospitalization experiences (97%). Staff (n=6) reported that the intervention was a useful in engaging patients in care. There was a statistically significant decrease in self-reported stimulant use from baseline [Odds Ratio (OR) 0.94, 95% Confidence Interval (CI) 0.90-0.98], p=0.002)]. A non-statistically significant increase in UDT positivity was found (OR 1.26, 95% CI 0.98-1.26, p=0.077).
Conclusions: This pilot study suggests that CM interventions are feasible in hospital settings and may help reduce stimulant use and improve engagement in medical treatment. Future studies to investigate the efficacy of CM for SUD in hospitalized settings are warranted.

T141. Post-Traumatic Stress Disorder Symptom Clusters are Differentially Associated With Brain Reactivity to Cocaine Cues

Heather Webber[*1], Danielle Kessler[2], Emma Lathan[1], Margaret Wardle[3], Charles Green[1], Joy Schmitz[1], Scott Lane[1], Francesco Versace[4], Anka Vujanovic[5]*
[1]University of Texas Health Science Center, [2]Rice University, [3]University of Illinois, [4]MD Anderson Cancer Center, [5]University of Houston

Abstract Detail Human
Select Drug Category Stimulants
Topic Imaging
Abstract Category Original Research

Aim: Substance use disorder and posttraumatic stress disorder (PTSD) commonly co-occur, but it is unclear which PTSD symptoms are related to drug cue reactivity. The current study assessed the predictive ability of DSM-5 PTSD symptom clusters with regard to brain reactivity to cocaine cues in individuals with cocaine use disorder (CUD). Given cocaine's stimulant effects, we hypothesized that PTSD avoidance and alterations in cognition and mood, but not arousal or intrusions, would be positively related to brain reactivity to cocaine cues.
Methods: We collected electroencephalogram data during a picture viewing task on a sample of individuals with CUD (n = 53) entering a clinical trial. Participants viewed pleasant, unpleasant, neutral and cocaine-related images. Brain reactivity to cues was defined as the late positive potential (LPP) mean amplitude between 400-800 milliseconds after image onset. Participants also completed a clinical interview and the PTSD Checklist for DSM-5 (PCL-5). Linear mixed modeling assessed the individual and interactive effects of image type and PCL-5 clusters (Cluster B: intrusions, Cluster C: avoidance, Cluster D: negative alterations in cognition and mood, E: arousal) on LPP amplitude.
Results: Linear mixed modeling revealed an interaction between PTSD Cluster D symptom severity and image type ($p < .001$), such that individuals with higher negative alterations in cognition and mood had greater reactivity to cocaine images ($B = -2.907$, $SE = 2.907$, $t = -2.907$, $p < .001$). Oppositely, those with lower PTSD Cluster E symptoms had greater reactivity to cocaine cues ($B = 2.161$, $SE = 0.794$, $t = 2.724$, $p < .01$).
Conclusions: These findings highlight the potential clinical utility of the LPP in assessing the effects of PTSD symptoms on drug cue reactivity. Further, interventions targeting these specific PTSD symptoms may aid in lowering brain reactivity to cues, improving treatment of co-occurring PTSD and substance use disorder.

T142. Now or Later? Depression, Anhedonia, and Decision-Making in Cocaine Use Disorder

Jennifer Hoots[*1], Jin Yoon[2], Scott Lane[2], Joy Schmitz[2], Margaret Wardle[1]*
[1]University of Illinois At Chicago, [2]University of Texas Health Science Center at Houston

Abstract Detail Human
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Category Original Research

Aim: A defining characteristic of cocaine use disorder (CUD) is repeatedly choosing cocaine over larger but relatively delayed rewards. Delay discounting, which describes how the value of rewards decreases as the delay until receipt increases, reflects this myopic decision-making among individuals with CUD. This study focuses on the relationship of delay discounting with depression symptoms and anhedonia, factors that exhibit functionally significant deficits in CUD and show promise for future treatment. We primarily hypothesized that higher levels of depression and anhedonia relate to steeper delay discounting, as individuals seek immediate rewards to improve mood and experience pleasure. However, mixed literature suggesting competing theories and the possibility of complex relationships indicated the importance of also testing quadratic relationships.
Methods: This secondary analysis uses baseline data from treatment-seeking male and female adults with CUD (N=79). To measure delay discounting, subjects repeatedly chose between a sooner-smaller and larger-later hypothetical reward. In multiple regression, we analyzed delay discounting (AUClog) as the dependent variable with measures of depression symptoms (Beck Depression Inventory Second Edition) and anhedonia (Snaith-Hamilton Pleasure Scale) as predictors.
Results: This analysis revealed significant quadratic relationships for delay discounting with depression symptoms and anhedonia ($R2=0.17$, $F(4,70)=3.64$, $p=0.009$). Low and high levels of depression were associated with steeper delay discounting than moderate levels ($\beta=-0.34$, $p=0.02$). Conversely, moderate levels of anhedonia were associated with steeper delay discounting compared to low and high levels ($\beta=0.38$, $p=0.02$).

Conclusions: These relationships for depression symptoms and anhedonia with delay discounting indicate differential associations of mood and reward-processing with decision-making in CUD. Moderately negative mood may promote risk-averse decisions, while those with low and high levels of depression display steeper delay discounting. Moderate levels of anhedonia may be related to perceptions of smaller reward magnitudes and high motivation for rewards, a combination which results in steeper delay discounting than low or high anhedonia.

T143. Corticotropin-Releasing Factor Receptor Type 1 Signaling in the Basolateral Amygdala Facilitates Context-Cocaine Memory Reconsolidation in Male and Female Rats

Jobe Ritchie[*1], Jennifer Walters[1], Justine Galliou[1], Christopher Ibarra[1], Shayna Grogan[1], Rita Fuchs[1]*
[1]Washington State University

Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Upon retrieval, drug-associated memories become destabilized and require memory reconsolidation to maintain their strength over time. Thus, interference with memory reconsolidation may promote drug abstinence. The basolateral amygdala (BLA) is a critical brain region for cocaine-memory reconsolidation. Corticotropin-releasing factor receptor type 1 (CRFR1) is densely expressed in the BLA, and CRFR1 stimulation activates intracellular signaling cascades that are necessary for memory reconsolidation. Hence, we tested the hypothesis that BLA CRFR1 stimulation itself is requisite for cocaine-memory reconsolidation.

Methods: Male and female Sprague-Dawley rats (n = 5 - 10/sex/treatment) were trained to self-administer cocaine intravenously in a distinct environmental context over 10 days. This was followed by extinction training in a different context over 7 days. Next, rats were re-exposed to the cocaine-paired context for 15 min to retrieve cocaine memories and trigger reconsolidation. Immediately, or six hours later, they received bilateral vehicle, corticotropin-releasing factor (CRF; 30 or 500 ng/hemisphere), or antalarmin (CRFR1 antagonist; 500 ng/hemisphere) infusions into the BLA. Drug context-induced cocaine seeking, an index of context-cocaine memory strength, was assessed three days later.

Results: Females responded more than males during cocaine self-administration and extinction training; however, there were no significant sex differences in the effects of CRFR1 manipulations on cocaine-memory strength. Antalarmin administration into the BLA immediately after memory reactivation (i.e., during memory destabilization), but not six hours later (i.e., after memory reconsolidation), attenuated drug context-induced cocaine seeking three days later relative to vehicle (Tukey's tests, $\alpha = .05$). Exogenous CRF administration into the BLA similarly attenuated cocaine-seeking behavior without altering CRFR1 internalization during memory reconsolidation, 30 min post-treatment, or general activity at test, three days later.

Conclusions: These findings demonstrate that CRFR1 signaling in the BLA facilitates cocaine-memory strength during reconsolidation and may be of interest as a target for anti-relapse treatment strategies.

T144. Characterizing Stimulant Overdoses: A Qualitative Analysis of Experiences and Responses to Overamping

Manal Mansoor[*1], Andrew Ivsins[1], Taylor Fleming[2], Allison Baker[2], Ryan McNeil[3]*
[1]University of British Columbia Faculty of Medicine, [2]British Columbia Centre on Substance Use, [3]Yale School of Medicine

Abstract Detail Human
Select Drug Category Stimulants
Topic Prevention
Abstract Category Original Research

Aim: North America's current overdose crisis has largely focused on opioids and resulted in considerable research and harm reduction efforts to address opioid-related overdose risks. Less attention has been paid to people who use stimulants (PWUS) despite a recent increase in stimulant use and stimulant-involved overdoses (i.e., "overamping"); what has been termed as the 'fourth wave' of the overdose crisis. As a result, experiences of, and responses to, overamping are poorly understood, thereby putting people who use stimulants at heightened risk. This poster explores how people who use stimulants understand, experience, and respond to overamping for the purposes of better informing public health responses.

Methods: In-depth qualitative interviews were conducted with 86 people who use stimulants in Vancouver, Canada's Downtown Eastside neighbourhood. Thematic analysis of interviews focused on contextualizing stimulant overdoses, including how PWUS understand, define, experience, and respond to overamping.
Results: Participants associated overamping experiences with commonly identified characteristics, such as rapid onset, high heart rate with potential for cardiac arrest, and seizures. However, participants also reported indicators of overamping, such as audio-visual hallucinations, self-harm, incontinence, and unconsciousness. Our findings demonstrate that, even among people who use stimulants, understandings and experiences of overamping varied considerably. Naturally, this impacted the ability to adequately respond to stimulant overdoses, which were primarily self-managed through methods including but not limited to stabilizing breathing, polysubstance use and cold showers.
Conclusions: Given the growing role of stimulant use in North America's overdose crisis, there is an urgent need to improve the identification of these overdoses in real world settings. Our findings identify a gap in current understandings of stimulant overdose and demonstrate the need for public health and harm reduction interventions to better address overamp risk among PWUS, including harm reduction campaigns to disseminate information regarding identifying signs of, and proper responses to, overamping.

T145. Magnitude and Predictors of Khat Use Among Patients With Tuberculosis in Southwest Ethiopia: A Longitudinal Study

Matiwos Daba[*1], Omega Tolessa[2], Markos Tesfaye[3], Kristina Adorjan[4], Wolfgang Krahl[5], Elias Tesfaye[6], Yimanu Yitay[6], Ralf Strobl[7], Eva Grill[7]*
[1]Jimma University, [2]Wolkite University, Ethiopia, [3]St. Paul's Hospital Millennium Medical College, Ethiopia, [4]LMU, Germany, [5]IsarAmper Klinikum, Germany, [6]Jimma University, Ethiopia, [7]LMU Munich, Germany
Abstract Detail Human
Select Drug Category Stimulants
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Tuberculosis (TB) is a leading cause of morbidity and mortality in low and middle-income countries. Substance use negatively affects TB treatment outcomes. Our recent study has found that khat use predicted poorer adherence to anti-TB medications. However, there is a scarce longitudinal study on predictors of khat use among outpatients with TB, and this study aimed at addressing this research gap.
Methods: A total of 268 outpatients with TB on DOTs were enrolled in a longitudinal study from 26 health institutions in Southwest Ethiopia. Structured questionnaires translated into local languages were used to assess khat use. Patients were followed for six months, and data were collected on three occasions during the follow-up. A generalized linear mixed model was used to identify the relation between khat use and predictors. Model fitness was checked using the Bayesian Information Criterion (BIC). Odds ratio (OR) and 95% CI were used to describe the strength of association.
Results: The overall prevalence of khat use at baseline and first follow-up was 39.2% while it was 37.3% at the second follow-up. Of this, 77.1% and 96.2% of them believed that khat use reduces the side effects of anti-TB medications and symptoms of tuberculosis respectively. In the final model, being male (aOR=7.0, p-value=0.001), being a government employee (aOR=0.03, p-value≤0.001) and the presence of alcohol use disorders (AUD) (aOR=2.0, p-value≤0.001) predicted khat use among outpatients with tuberculosis.
Conclusions: A considerable proportion of patients with TB used khat throughout DOTs and wrongly perceived that it had health benefits. The finding implies that all patients diagnosed with TB should be screened for khat use, and a particular emphasis should be given to males and individuals with a history of alcohol use. Moreover, further studies are needed to assess patients' beliefs regarding the benefits of khat use so that interventions can be developed.

T146. Understanding the Role of Cognitive Performance in Vulnerability to Cocaine Use Disorder in Socially Housed Female and Male Monkeys

Christina Norman[*1], Bernard Johnson[1], Robert Gould[1], Michael Coller[1], Jillian Odom[1], Michael Nader[1]*
[1]Wake Forest School of Medicine
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology

Abstract Category Original Research
Aim: Although cocaine use disorder (CUD) has no FDA-approved pharmacotherapies, cognitive behavioral therapy has shown some efficacy in maintaining abstinence. The present study aims to evaluate cognitive performance as a potential behavioral biomarker related to cocaine vulnerability using a homologous nonhuman primate model involving socially housed female and male monkeys. A previous study (Kromrey et al., 2016) in female monkeys showed that the effects of social rank on a working memory task (delay match sample) were transient and only apparent early in the formation of social hierarchies. The present study extended these earlier findings by evaluating three different cognitive domains in well-established same-sex social groups of male and female cynomolgus monkeys (N/8/sex).
Methods: Cocaine-naïve monkeys were trained to complete a battery of cognitive tasks which evaluated executive function (stimulus discrimination, SD and reversals, SDR)), learning and memory (compound discrimination, CD), and cognitive flexibility (interdimensional/extradimensional shifting, ID/ED and reversal, EDR). All animals were trained on the SD/SDR task and subsequently exposed to all other tasks in a singular cognitive battery probe. The test battery consisted of monkeys performing all tasks (SD/SDR, CD, ID/ED, EDR) in 1-2 sessions; criteria for moving to the next task was 80% correct trials.
Results: Because our previous studies found that dominant females (Nader et al., 2012) and subordinate males (Morgan et al., 2002) were more vulnerable to cocaine abuse, we hypothesized that those groups would make the most errors on the test battery. Preliminary findings however found that dominant animals of both sexes made less errors and required less trials to complete the test battery.
Conclusions: Acquisition of cocaine self-administration will be studied next and when complete, we will be able to determine which cognitive domain has the greatest relationship with vulnerability and future studies will determine how long-term cocaine exposure and potential treatments influences these behaviors.

T147. Typologies of Crystal Methamphetamine Use and Disparities in Care Access Among Community-Recruited People who Use Illicit Drugs in a Canadian Setting

Olivia Brooks[*1], Paxton Bach[2], Huiru Dong[2], M-J Milloy[2], Thomas Kerr[2], Kanna Hayashi[3]*
[1]University of British Columbia, [2]British Columbia Centre on Substance Use, [3]Simon Fraser University
Abstract Detail Human
Select Drug Category Stimulants
Topic Disparities
Abstract Category Original Research
Aim: Aim: Literature suggests important distinctions may exist among subgroups of people who use crystal methamphetamine (CM), including men who have sex with men (MSM), those unstably housed, and patients in opioid agonist therapy (OAT). We aimed to identify latent classes of CM users and potential disparities in access to addiction care among community-recruited people who use illicit drugs (PWUD).
Methods: Methods: Data were drawn from prospective cohort studies of PWUD in Vancouver, Canada in 2014-2018. Repeated measures latent class analysis was performed to determine subgroups of CM users. Multivariable generalized estimating equations models were fit to determine associated demographic and behavioural characteristics.
Results: Results: Eligible CM-using 916 participants were primarily nonwhite (51%) and men (62%), and the median age was 43 years. A five-class model demonstrated the best fit, with the subgroups characterized as: (1) street-income generation (30.0%), (2) OAT patients (23.5%), (3) MSM (7.6%), (4) primary stimulant using men (16.6%), and (5) women engaging in sex work and opioid use (22.2%). Baseline prevalence of non-OAT addiction care access was 9.6% in the entire sample. In multivariable analyses, compared to Subgroup 4, non-fatal overdose was positively associated with Subgroup 1 (adjusted odds ratio [AOR]: 1.55, 95% confidence interval [CI]: 1.35-1.78), Subgroup 2 (AOR: 1.20, 95% CI: 1.04-1.39) and Subgroup 5 (AOR: 1.50, 95% CI: 1.29-1.75), however, was negatively associated with Subgroup 3 (AOR: 0.82, 95% CI: 0.69-0.98). Similarly, Subgroup 1 (AOR: 0.75, 95% CI: 0.62-0.91), Subgroup 2 (AOR: 0.75, 95% CI: 0.61-0.92), and Subgroup 5 (AOR: 0.78, 95% CI: 0.62-0.98) had less engagement in non-OAT addiction care while Subgroup 3 did not (AOR: 0.98, 95% CI: 0.79-1.20).
Conclusions: Conclusion: We identified five distinct subgroups of CM users. The overall low access to non-OAT addiction care and significant disparities in care access and overdose risk indicate a need for tailored services for each subgroup.

T148. Effects of Novel Kappa Opioid Receptor Agonist 4N-Methyl-Substituted-3,4-Dichlorophenylacetamide-9-(N)-Pyrrolidine-Pyranopiperazine Pretreatment on Cocaine Self-Administration in Male C57/BL6 Mice

Philip Pikus[*1], Kyle Windisch[1], Michelle Morochnik[1], Ariel Ben-Ezra[1], Brian Reed[1], Mary Jeanne Kreek[1]*
[1]The Rockefeller University

Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Pharmacology
Abstract Category Original Research

Aim: Kappa opioid receptor (KOPr) agonists are a potential target for the treatment of cocaine/psychostimulant dependence. We have developed a series of analogues of a 4N-substituted-3,4-dichlorophenylacetamide-9-(N)-pyrrolidine-pyranopiperazine (PAPPP) scaffold, for which preliminary in vitro and in vivo data indicate biased KOPr agonism. Here we evaluate the N-methylated analogue (Me-PAPPP) (compared with U50,488) in a 2-hr mouse self-administration paradigm, with and without short-acting KOPr antagonist LY2444296 pretreatment to evaluate KOPr specificity.

Methods: Adult male C57/BL6 mice underwent intrajugular catheterization surgery. Groups of mice had daily 2-hr cocaine self-administration sessions with a single unit dose of cocaine (0.5mg/kg/inf; FR1) at a consistent time of day, for the entire experiment. After 7 days of acquisition, mice received pretreatment of one of the two Me-PAPPP enantiomers (20mg/kg/ip), U50,488 (3mg/kg/ip), or vehicle. After 5 days of treatment, LY2444296 (3mg/kg/ip) was administered prior to KOPr agonist for 2 days.

Results: All groups exhibited substantial escalation in cocaine intake over the 7-day acquisition period. Upon U50,488 pretreatment, mice showed an approximately 30% potentiation of cocaine intake. The Me-PAPPP group exhibited a trend towards attenuation of cocaine intake compared with its enantiomer and vehicle group. LY2444296 pretreatment reversed the potentiation in the U50,488 group, but did not significantly alter intake in the Me-PAPPP group.

Conclusions: At a single unit dose of cocaine, Me-PAPPP exhibited a trend towards attenuation of cocaine intake. Coupled with our lab's previous preliminary data showing a similar trend on a progressive ratio schedule, this indicates that the PAPPP scaffold may alter cocaine-associated reward pathways. However, unlike with U50,488, these effects were not reversed by LY2444296 treatment. Further studies are needed to elucidate the KOPr selectivity of PAPPP in self-administration models, and to evaluate the effects of compound dosing or cocaine unit dose.

T149. Influence of Orexin Antagonism on the Reinforcing, Subjective and Physiological Effects of Intravenous Cocaine

William Stoops[*1], Joshua Lile[2], Kevin Hatton[2], Lon Hays[1], Abner Rayapati[1], Craig Rush[1]*
[1]University of Kentucky, [2]University of Kentucky, College of Medicine

Abstract Detail Human
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: One area of intense interest in preclinical cocaine addiction research is understanding the role of the orexin system. The first and only clinically available orexin antagonist, suvorexant (Belsomra®), attenuates motivation for cocaine and cocaine conditioned place preference, as well as cocaine-associated impulsive responding, in preclinical models. This study aims to translate those preclinical findings and determine whether suvorexant maintenance alters the pharmacodynamic effects of cocaine in humans. We hypothesize that suvorexant will reduce cocaine self-administration and other abuse-related effects.

Methods: To date, 4 non-treatment seeking participants with cocaine use disorder have completed this ongoing within-subject human laboratory study; a partial data set was obtained from one additional subject who was discharged at the outset of the COVID-19 pandemic. Participants are maintained on 0, 5, 10 and 20 mg oral suvorexant/day in random order. After at least 3 days of maintenance on the target dose, participants complete experimental sessions in which the reinforcing, subjective and physiological effects of 0, 10 and 30 mg/70 kg of intravenous cocaine are determined. Mixed-effects analyses (Prism 9, GraphPad) were used to analyze data.

Results: Cocaine functioned as a reinforcer, producing significant (i.e., $p<0.05$) dose related increases in self-administration. Cocaine increased prototypic subjective and physiological effects (e.g., ratings of "Rush" and

blood pressure; p values<0.05). Suvorexant did not significantly alter any effects of cocaine, nor did it change self-reported sleep outcomes.
Conclusions: Data indicate that antagonizing the orexin system through suvorexant maintenance fails to change any pharmacodynamic effects of cocaine. However, more participants are needed for this ongoing project before drawing final conclusions about the potential impact of orexin antagonism on the reinforcing and other abuse-related effects of cocaine in humans.

T150. Sex Differences in Neuroinflammation Following Synthetic Cathinone Self-Administration

Julie Marusich[*1], Elaine Gay[1], Bruce Blough[1]*
[1]RTI International
Abstract Detail Animal Study
Select Drug Category Club/Designer Drugs
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: Stimulants of abuse often produce neuroinflammation, and primary inflammatory cytokines mediate the response to stimulant exposure. This research examined stages of synthetic cathinone abuse using rodent self-administration and measured the underlying inflammatory profile. We hypothesized that stimulant-induced neuroinflammation differed based on mechanism of action, duration of drug exposure, and sex.
Methods: Male and female rats were trained to self-administer α-pyrrolidinopentiophenone (α-PVP) or mephedrone. Rats self-administered on a fixed ratio 1 schedule of reinforcement for 21 days during daily 1 hr (short access; ShA) or 6 hr sessions (long access; LgA) (n=8/sex/group). Levels of inflammatory cytokines were measured in plasma and brain tissue from amygdala, hippocampus, hypothalamus, PFC, striatum, and thalamus.
Results: Rats acquired synthetic cathinone self-administration. There were no effects of sex or sex x lever interactions in self-administration (p>0.05). Self-administration of α-PVP and mephedrone produced profound sex differences in inflammatory cytokines that are linked to substance use disorders (IL-1α, IL-1β, IL-6, CCL2 and TNF-α; p<0.05). There were widespread increases in inflammatory cytokines in the brains of males compared to females, whereas females were more likely to show increased inflammatory cytokines in plasma than males (p<0.05). Furthermore, sex differences in cytokine levels were more common after LgA than ShA synthetic cathinone exposure (p<0.05). Additionally, mephedrone produced a larger magnitude of neuroinflammation and more widespread sex differences in neuroinflammation than α-PVP.
Conclusions: Synthetic cathinone use may produce sex differences in neuroinflammation during the transition from use to abuse. These sex differences in neuroinflammation may only emerge after dysregulated drug intake has occurred, and mechanism of action may be a pivotal factor in the development of neuroinflammation. Collectively, these results suggest that sex-specific reduction of inflammation may be a viable therapeutic strategy for stimulant use disorders.

T152. Flip Phones are Making a Comeback: How Patients Enrolled in a Licensed Opioid Treatment Program Used Donated Flip Phones to Access Clinical Services During the COVID-19 Pandemic

Gabby Agin-Liebes[*1], Elnaz Ahmadi[1], Charlotte Evans[1], D. Andrew Tompkins[2]*
[1]University of California, San Francisco, [2]University of California San Francisco School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Investigators assessed the efficacy of a phone distribution program that was implemented at the start of the COVID-19 pandemic. This program aimed to help ensure continued delivery of clinical services to patients enrolled in a licensed opioid treatment program (OTP).
Methods: Participants (N = 238) were provided flip phones over a period of three months beginning 4/10/2020 and ending 6/30/2020. Following distribution, participants were followed for three months to assess phone retention, usage for phone counseling visits, and retention in treatment.
Results: Participants were primarily Caucasian (50%), non-Hispanic (88%), male (76%), housed (59%), and aged, on average, 46.5 years (+/- 11.7). A total of 56%, 45%, and 42% of patients, respectively, were still in possession

of their phones at the 1-month, 2-month and 3-month time points. Chi-square analyses revealed that participants who had been in treatment at the clinic for >1 year versus <1 year ($p = .004$) were more likely to retain their phone for three months. At all three time points, the patients who retained possession of their phones were significantly older ($p < .001$) and were less likely to be homeless than those who no longer possessed their phone ($p < .001$) during the prior month. There was a positive correlation between possession of phone and number of phone counseling sessions held in the prior month at all three time points (Pearson's $r = 0.49$, $p < .001$; $r = 0.59$, $p < .001$; $r = 0.58$, $p < .001$, respectively). Additionally, possession of a phone after two months was associated with increased odds of being retained in treatment versus discharged (OR = 2.66, $p = .027$).
Conclusions: Our findings suggest the potential efficacy of distributing flip phones to OTP patients to ensure continued access to counseling during the COVID-19 pandemic.

Wednesday, June 23, 2021

Virtual Poster Q&A Session III: Alcohol

W1. Emotion Dysregulation and Childhood Abuse Predict Lifetime Substance Use in an Underserved Population

Adrienne Gilmore-Thomas[*1], Angela Heads*[1]
[1]*University of Texas Health Science Center*
Abstract Detail Human
Select Drug Category Alcohol
Topic Behavior
Abstract Category Original Research
Aim: Individuals who experienced childhood abuse are more likely to engage in substance use (SU) and have trouble regulating their emotions. This study examined the effects of childhood trauma (emotional, physical, and sexual abuse) and emotional dysregulation (ED; engaging in goal-directed activity when distressed, inhibition of impulses, and coping strategies when distressed) between childhood abuse and lifetime SU.
Methods: The sample consisted of 161 participants (agem = 40.40, SD = 14.60) who participated in an outpatient treatment program for substance use disorders. 59.7% (n = 114) identified as cis-male, 18.3% were Latinx (n = 35), 49.7% African American (n = 95), and 40.3% white (n = 77). Participants completed the Childhood Trauma Questionnaire (CTQ), Difficulties with Emotion Regulation Scale (DERS), and the NIDA- Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). Logistic regression analysis was used to test if emotional dysregulation and childhood abuse significantly predicted lifetime substance use.
Results: Logistic regression analysis determined the degree to which childhood abuse and ED predicted lifetime SU. The predictor variables were childhood physical abuse, sexual abuse, and emotional abuse. Childhood emotional abuse predicted use of hallucinogens (chi-squared(8, N = 122) = 5.67, $p < .05$). Emotional and physical abuse predicted use of sedatives (chi-squared(1, N = 122) = 16.58, $p < .05$). Emotional and sexual abuse predicted opiate use (chi-squared(8, N = 122) = 14.46, $p < .05$).
Conclusions: ED, shown here, suggests difficulty regulating emotions does not significantly predict lifetime substance use. Future research should strive to identify whether limitations in one's regulation of emotions impact current and lifetime SU. Future implications should involve using ED as a mediator to determine whether it has an indirect effect on SU.

W2. Racial-Ethnic Differences in Trends in Alcohol Use Among U.S. Pregnant Women: Analyses of the National Survey on Drug Use and Health 2002 -2018

Ayomide David[*1], Vinita Sharma*[1], Catalina Lopez-Quintero*[1]
[1]*University of Florida*
Abstract Detail Human
Select Drug Category Alcohol
Topic Disparities
Abstract Category Original Research
Aim: This study aims to describe racial-ethnic differences in trends of a) past-30-day alcohol use; and b) past-30 day binge drinking among US pregnant women.

Methods: Data from 12,181 adult pregnant women (18 to 44 years old) surveyed between the 2002-2018 National Study on Drug Use and Health (NSDUH) were analyzed in this study. Multiple logistic regression models were used to model alcohol use in the 30 days prior to the survey as a function of interview year for each self-identified racial/ethnic group [Non-Hispanic Whites (NHW), Non-Hispanic Blacks (NHB) and Hispanics (H)], adjusted for sociodemographic covariates and trimester of pregnancy. The analyses account for the complex survey's design.
Results: From 2002 to 2018, rates of alcohol use in the past 30 days among pregnant women significantly declined for NHW (13.2% vs. 8.8%) and Hispanics (7.2% vs. 4.6%), but not for NHB (11.6% vs. 12.8%). From 2002 to 2018, rates of binge drinking in the past 30 days among pregnant women remained the same for NHW (2.9% to 3.1%) and NHB (5.7% to 5.6%) and Hispanics (2.1% to 2.0%). Race-ethnic specific analyses suggest that the decline observed among NHW was significant only among those who attained college education ($p<0.05$).
Conclusions: Across the 17 years analyzed, NHB showed the highest rates of past 30-days alcohol use and binge drinking in the 30 days prior to the survey. A better understanding of the systemic factors driving alcohol use during pregnancy among NHB might help reduce fetal alcohol exposure and its consequences.

W3. Alcohol Use Screening Among People With Hepatitis C Virus Infection in a Safety-Net Health System

Mirsada Serdarevic[1], Brooke MacDonald[1], Matthew Cvitanovich[1], Dustin DeMoss[1], Rohit Ojha[1]*
[1]JPS Health Network
Abstract Detail Human
Select Drug Category Alcohol
Topic Health Services
Abstract Category Original Research
Aim: Excess alcohol use is common among people with hepatitis C virus (HCV) infection and increases the rates of adverse hepatic outcomes and mortality. The Centers for Disease Control and Prevention recommends screening problematic alcohol use following an HCV diagnosis using the Alcohol Use Disorders Identification Test (AUDIT), but adherence to this guideline is not well-described. We aimed to estimate AUDIT uptake following an HCV diagnosis.
Methods: We used data from the Hepatitis C Virus Outcomes Registry (HepCOR), which is a longitudinal registry of people diagnosed with HCV infection in a safety-net health system in Texas. Eligible individuals were aged >18 years, had a positive HCV-RNA test between January 1, 2013 and December 31, 2018 with follow-up through December 31, 2019, and no history of cirrhosis or hepatocellular carcinoma. AUDIT uptake was defined as a completed AUDIT screening following a diagnosis of HCV. We used a competing-risk framework with death as the competing risk to compute 1-year cumulative incidence of AUDIT uptake following an HCV diagnosis.
Results: Our study population comprised 3,549 individuals among whom median age was 54 years, 62% were male, and 52% were non-Hispanic White. Cumulative incidence of AUDIT uptake in the year following HCV diagnosis was 7.4% (95% CL: 6.5%, 8.3%). AUDIT uptake was modestly higher than overall population for individuals with a history of anxiety (13%, 95% CL: 11%, 15%), depressive disorder (11%, 95% CL: 9.5%, 13%), alcohol use disorder (11%, 95% CL: 9.2%, 14%), or injection drug use (11%, 95% CL: 9.3%, 13%).
Conclusions: We observed low uptake of AUDIT following HCV diagnosis. Our findings warrant exploring barriers and facilitators to implementing AUDIT screening in this setting, which could subsequently inform the development of interventions to optimize screening for problematic alcohol use among individuals with HCV.

W4. Fungal Permeability in Patients Admitted for Hospital Treatment of Alcohol Use Disorder

Daniel Fuster[1], Xavier Garcia-Calvo[1], Ferran Bolao[2], Paola Zuluaga[1], Alba Leis[1], Jordi Tor[1], Robert Muga[1]*
[1]Hospital Universitari Germans Trias i Pujol, [2]Hospital Universitari de Bellvitge
Abstract Detail Human
Select Drug Category Alcohol
Topic Epidemiology
Abstract Category Original Research
Aim: To describe the prevalence of fungal permeability and its disease correlates in patients admitted for hospital treatment of alcohol use disorder (AUD).
Methods: Cross-sectional study performed at two hospitals in Barcelona, Spain. No patient had decompensated liver disease. Clinical and laboratory parameters were obtained at admission. We measured markers of monocyte

activation (CD163 and sCD14), microbial translocation (lipopolysaccharide (LPS) and LPS binding protein (LPSBP) and inflammation (IL-6 and IL-10). Advanced liver fibrosis (ALF) was defined as a FIB-4 value>3.25. Fungal permeability was assessed by the presence of anti-Saccharomyces cerevisiae antibodies (ASCA; IgA and IgM).
Results: 309 patients (74.8% male) with a median age of 49 years (interquartile range [IQR]: 42-57) were included. Patients drank a median of 140 grams of alcohol daily (IQR: 100-220) and had a median duration of AUD of 20 years (IQR: 10-25). ALF was present in 23% and 12.4% had hepatitis C virus (HCV) infection. ASCA IgA and IgG were present in 31.4% and 17.8%, respectively.
Male sex and the presence of ALF were associated with a higher prevalence of fungal permeability (ASCA IgA: 35.9% vs. 17.9,p<0.01 and 47.0% vs. 37.3%, p<0.01, respectively; ASCA IgG: 20.3% vs. 10.2%,p<0.01 and 26.4% vs. 15.7%, p=0.04, respectively).
Those with ASCAs IgA had a higher median levels of AST (69 vs. 44, p<0.01), ALT (43 vs. 34, p<0.01), GGT (312 vs. 187,p=0.04), bilirubin (1.1 vs. 0.77, p=0.01), urea (28.7 vs. 24.6, p<0.02), CD163 (775 vs. 652, p<0.01) and LPSBP (58 vs. 32,p<0.01), and a lower median values of albumin (38.5 vs. 40.1, p<0.01).
Those with ASCAs IgA had a higher median levels of CD163 (770 vs. 672, p<0.01) and LPSBP (60 vs. 35,p<0.02).
Conclusions: The presence of fungal permeability in this patient series was associated with male sex, ALF, and higher median values of markers of liver damage, monocyte activation and microbial translocation.

W5. Testing the Validity of the AUDIT-C and AUDIT-3 to Detect Unhealthy Drinking in a High-Risk Population in Lusaka, Zambia

Sachi Inoue[1], Tukiya Kanguya[2], Chipo Chitambi[2], Laura Murray[3], Michael Vinikoor[4], Jeremy Kane[1]*
[1]Columbia University Mailman School of Public Health, [2]Centre for Infectious Disease Research in Zambia (CIDRZ), [3]Johns Hopkins Bloomberg School of Public Health, [4]University of Alabama at Birmingham School of Medicine
Abstract Detail Human
Select Drug Category Alcohol
Topic Epidemiology
Abstract Category Original Research
Aim: The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item screening tool for detecting harmful, hazardous, and dependent alcohol use. Brief versions of the tool include the AUDIT-C (first 3 questions) and the AUDIT-3 (only third question on binge drinking). Brief versions of the tool have been validated for use in other settings, but not previously in Zambia. The main aim was to evaluate brief versions of the AUDIT against the full AUDIT when used in Zambia. A secondary aim was to test if brief versions could detect comparable effect size changes to the full AUDIT in a clinical trial.
Methods: The What Works (WW) trial tested the effectiveness of the Common Elements Treatment Approach (CETA) for reducing alcohol use. The 10-item AUDIT that WW trial participants completed was used to generate AUDIT-C and AUDIT-3 scores. Sensitivity and specificity analyses were conducted and the detected change in effect size for the trials from baseline to follow-up using the brief versions were tested against the full AUDIT with mixed effects regression.
Results: Data from 247 women and 248 men were included. 77.82% of men and 48.99% of women screened positive for unhealthy alcohol use with the full AUDIT. The AUDIT-C performed well at cut-off ≥ 3 for both men (sensitivity: 91.19%; specificity: 78.18%) and women (sensitivity: 90.08%; specificity: 92.06%). The AUDIT-3 performed best at cut-off ≥ 1, but with poor specificity for men (sensitivity: 89.12%; specificity: 60.00%) and moderate abilities for women (sensitivity: 84.87%; specificity: 83.33%). The AUDIT-C and AUDIT-3 were unable to detect effect size changes similar to those obtained when using the full AUDIT.
Conclusions: The AUDIT-C could be used as a brief screening tool for clinical use in Zambia among populations with high prevalence of alcohol use. For clinical trials, the full AUDIT is recommended to detect effect size changes.

W6. Demographic Influences on College Student Drinking Motives and Outcomes

Timothy Regan[1], Pranali Haribhakti[2], Sherecce Fields[1]*
[1]Texas A&M University, [2]University of Northern Colorado
Abstract Detail Human

Select Drug Category Alcohol
Topic Racial/Ethnic Differences
Abstract Category Original Research
Aim: Sociocultural aspects of identity can explain the functional significance of alcohol drinking and risk for negative consequences. Qualities of diversity often overlap, raising or reducing motives for and outcomes related to alcohol use. Our aim was to examine how gender, ethnic, and generational student differences (and their combinations) explain variation in individuals' reasons to drink and levels of unhealthy alcohol use during the first year of college.
Methods: Students (N = 185, mean age = 18.6 years, 67% female) enrolled in a predominately White U.S. university completed self-report measures online at a single time point. The sample was largely Caucasian (54.1%) and Hispanic/Latinx (24.9%), with lesser individuals reporting Biracial/Multiracial (11.0%) and East/South/Southeast Asian (8.8%) ethnicities. 70.3% of students indicated no previous family members had earned a degree from the host institution.
Results: A Multiple Analysis of Variance revealed a three-way interaction. Compared to their female, non-White, first-generation counterparts, White male participants whose family member(s) earned at least a baccalaureate degree from the host institution reported the highest motivations to drink to achieve effects related to self-esteem and sexual enhancement. Non-first-generation participants also endorsed more hazardous alcohol consumption.
Conclusions: White, male, non-first-generation college students may be more susceptible to drink alcohol as a means to improve their self-esteem and/or sexual performance. First-year alcohol prevention programming exploring and/or modifying potentially harmful sociocultural messages surrounding alcohol may be useful for this group. Further research examining diversity intersections would create a framework to explain differences in drinking motivations and outcomes.

W7. A Longitudinal Mediation Model of Negative Emotionality, Coping Motives, and Drinking Intensity

Victoria Votaw[*1], Elena Stein[1], Katie Witkiewitz[1]*
[1]University of New Mexico
Abstract Detail Human
Select Drug Category Alcohol
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Negative emotionality is a key domain in frameworks measuring heterogeneity in AUD, such as the Addictions Neuroclinical Assessment (ANA). Recent research has examined the construct validity of the ANA negative emotionality domain but has not examined whether this domain demonstrates predictive validity for drinking motives and outcomes. In this study, we examined the association between baseline negative emotionality and drinking intensity one year following AUD treatment initiation. We also assessed whether coping motives for alcohol use at 6 months following treatment initiation and changes in coping motives mediated this association.
Methods: This was a secondary data analysis of a multisite prospective study of individuals entering AUD treatment (n=263; 61.6% male; mean age=33.8). The associations between the ANA negative emotionality domain, coping motives, and drinking intensity over time were assessed using a latent growth curve mediation model.
Results: The ANA negative emotionality domain at baseline was indirectly associated with greater 7- to 12-month drinking intensity through higher coping motives at 6-months. Negative emotionality was not related to change in coping motives over the assessment period and change in coping motives was not related to 7- through 12-month drinking intensity.
Conclusions: This analysis provides evidence for the predictive validity of the ANA negative emotionality domain for coping motives and drinking intensity among treatment-seekers with AUD. Coping motives may be an important target in AUD treatment among those high in negative emotionality.

Virtual Poster Q&A Session III: Cannabis/Cannabinoids

W8. Profiles of Motives for Cannabis Use and Differences in Frequency and Consequences of Use Among U.S. College Students

Adriana Espinosa[1], Lesia M. Ruglass[1], Fiona N. Conway[2], Kristina M. Jackson[3], Helene R. White[4]*
[1]The Colin Powell School at The City College of New York, [2]The University of Texas at Austin, [3]Brown University, [4]Rutgers, the State University of NJ
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: We identified and described unique profiles of cannabis use motives among current cannabis-consuming university students and investigated whether the cannabis regulatory environment, demographic characteristics, and situational contexts differentiated the profiles. Finally, we examined profile differences in frequency and negative consequences of cannabis use across two time points.
Methods: Participants comprised a subsample from a study of simultaneous alcohol and marijuana use. Male and female college students (N = 1,213) were recruited from three universities located in states with different cannabis legislation (School A: criminalized, School B: decriminalized, School C: legal for adults over the age of 21). Latent profile analyses identified subgroups of cannabis users based on expansion, enhancement, social, and coping motives. ANOVAs and Chi-square tests of independence assessed demographic and contextual differences in patterns of cannabis use motives, and negative binomial regressions estimated differences in frequency and consequences of cannabis use.
Results: Six distinct cannabis use motives profiles were evident: [1] Low Motives (20.6%); [2] Low to Moderate Enhance (18.8%); [3] High Enhance (28.3%); [4] High Enhance & Social & Moderate Expand (11.2%); [5] High Enhance & Cope (14.5%) and [6] High Motives (6.6%). Those who used alone (RR = 3.1, $p < .001$) or were in school B (RR = 2.1, $p < .001$) were more likely to have high motives than their counterparts. Also, profiles with high motives had higher frequency of use and a greater number of consequences cross-sectionally as well as over time, relative to the low-to-moderate motives profiles.
Conclusions: Targeted interventions based on cannabis use motives profile may be warranted to reduce cannabis-related consequences.

W9. Differences in Cannabis and Other Drug Use Outcomes Between Two Cohorts of 18-20-Year-Old Cannabis Users Surveyed Pre and Post Recreational Cannabis Legalization in Los Angeles

Allison Mitchell[1], Ekaterina Fedorova[2], Carolyn Wong[3], Janna Ataiants[2], Bridgid Conn[4], Stephen Lankenau[2]*
[1]Dornsife School of Public Health, Drexel University, [2]Drexel University, [3]Children's Hospital Los Angeles and University of Southern California, [4]Children's Hospital Los Angeles
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: Cannabis was legalized for recreational use in California in 2016 for individuals 21 and older. Little is known regarding the impact of legalization of recreational cannabis on cannabis and other drug use among 18-20 years old's, who can only possess cannabis legally as medical cannabis patients, compared to 18-20-year old's who did not experience this policy change.
Methods: Cohorts of 18-20-year-old cannabis users, with and without medical cannabis recommendations, were surveyed in Los Angeles in 2014-15 (n=172 "pre-legalization") and 2019-20 (n=139 "post-legalization") using similar sampling methods and instruments. The cohorts were compared descriptively on socio-demographic characteristics, cannabis use, alcohol use, and other drug use. Logistic and negative binomial regressions estimated cohort differences in key drug use outcomes, such as days of marijuana, alcohol, and cigarette use in the past 3 months, and yes/no variables regarding concentrate use, edible use, medical cannabis use, and any prescription drug misuse after accounting for significant socio-demographic covariates.
Results: The post-legalization cohort were significantly less likely to be heterosexual or male, and significantly more likely to be Asian/Pacific Islander or employed compared to the pre-legalization cohort. The post-legalization cohort reported greater use of edibles ($p=0.002$) and concentrates ($p=0.08$), but fewer mean days of alcohol ($p=.001$) and cigarette ($p<0.001$) use, and less prescription drug misuse ($p=0.06$). Both cohorts averaged between 60-70 days of cannabis use in the past 90 days, but differences were not significant.

Conclusions: Results indicate that overall use of cannabis among 18-20-year old's was not higher in the post-legalization era, despite potentially greater access to cannabis. Specifically, we observed greater use of potent cannabis products sold in cannabis dispensaries, e.g., edibles, concentrates, but not overall days of cannabis use. The post-legalization cohort also reported less use of other drugs. However, monitoring potent cannabis products/forms is warranted.

W10. The Association of Prenatal Cannabis Use and Birth Outcomes in a Michigan Cohort

Alyssa Vanderziel[*1], Omayma Alshaarawy[1]*
[1]Michigan State University College of Human Medicine
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Epidemiology
Abstract Category Original Research
Aim: Cannabis use prevalence has doubled among pregnant women in the United States. Findings from previous research are mixed; while some studies suggest detrimental effects of cannabis use on birth outcomes, others report null findings. Prior epidemiological research is limited by retrospective data collection and the use of administrative records, introducing recall bias and incomplete data. Here, we use data from a longitudinal cohort of pregnant women to study the association between cannabis use, measured in 'real time' during pregnancy, and birth outcomes validated by state-archived birth records.
Methods: Data are for the Michigan Archive for Research on Child Health, a prospective study of pregnant women recruited using probability-based sampling from 11 sites across Michigan. Cannabis use was measured via self-report. Outcomes include birthweight, gestational age, 5-minute Apgar score, and neonatal intensive care unit (NICU) admission. Generalized linear models were used to estimate the association between cannabis use and birth outcomes.
Results: The total analytic sample is 406 women, of which 64 (16%) used cannabis during pregnancy. Compared to non-use, prenatal cannabis use is associated with a decrease in Apgar score (β = -0.20; 95% CI = -0.40, -0.01). Results were no longer robust after adjusting for potential confounders including maternal age, race, education, tobacco smoking, and alcohol drinking (β = -0.19; 95% CI = -0.41, 0.03). We did not observe an association between cannabis use and birthweight, NICU admission, or gestational age.
Conclusions: In a Michigan cohort of pregnant women, we did not observe an association between cannabis use and birthweight, gestational age, Apgar score, or NICU admission. Small sample size was a limitation; larger prospective studies are warranted. Since prenatal cannabis use is increasing, clinicians should counsel patients to discontinue cannabis use during pregnancy.

W11. Reasons for Changes in Physical and Mental Health and in Cannabis Use During the COVID-19 Pandemic Among Persons Living With HIV: An Analysis of Open-Ended Questions

Christina Parisi[*1], Yan Wang[1], Deepthi Varma[1], Krishna Vaddiparti[1], Gladys Ibanez[2], Robert Cook[1]*
[1]University of Florida, [2]Florida International University
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Persons living with HIV (PLWH) are at enhanced risk for adverse substance use, physical health, and mental health outcomes, but no prior study has investigated changes in these outcomes in the context of COVID-19 or underlying reasons for changes. The objectives of our qualitative inquiry are to 1) describe changes in physical and mental health and cannabis use in this population due to the COVID-19 pandemic and 2) understand the reasons behind these changes.
Methods: This is an analysis of open-ended questions administered during a follow-up call for a cohort study (MAPLE) aiming to examine the effects of cannabis on 222 PLWH in Florida. Data from open-ended questions were compiled in Microsoft Excel and manually coded. Codes were categorized under broader themes to understand reasons for changes in health or cannabis use.
Results: The sample had mean age=50.2 (SD=11.3) and was 50.5% female, 68.0% Black/African American, and 14.4% Hispanic/Latino. Compared with before the pandemic, 14% used cannabis less frequently while 9% used

more frequently. Twelve percent reported improvement and 11% reported worsening of physical health. Thirty percent had worse mental health whereas 8% reported improvement. Among those with worsened mental health, 73% said cannabis was helpful to them. Responses to open-ended questions indicated alleviating boredom was a primary reason for increased cannabis use, while worries about procuring cannabis and COVID-19 exposure led to decreased use. Social isolation and anxiety related to acquiring COVID-19 worsened mental health; however, seeing the pandemic as an opportunity to focus on mental and physical wellness reportedly improved mental and physical health.
Conclusions: The COVID-19 pandemic has had a mixed impact on cannabis use as well as the physical and mental health of PLWH. These findings show many PLWH were impacted in some way by the COVID-19 pandemic; therefore, providers need to address these concerns in their routine care.

W12. Medical Cannabis Patients Demonstrate Improved Driving Simulator Performance After 6 Months of Treatment

Mary Dahlgren[*1], Kelly Sagar[1], Rosemary Smith[1], Ashley Lambros[1], Celine El-Abboud[1], Staci Gruber[1]*
[1]McLean Hospital, Harvard Medical School
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Behavior
Abstract Category Original Research
Aim: Previously, we demonstrated that non-intoxicated, chronic, recreational cannabis users exhibit poorer driving performance relative to non-using healthy controls; these differences were localized to individuals with early onset cannabis use. However, no studies to date have examined the longitudinal impact of medical cannabis (MC) use on driving performance.
Methods: As part of a larger, longitudinal, observational study, male and female MC patients were assessed prior to initiating MC treatment (baseline) and at follow-up assessments after 3 and 6 months of MC treatment (n=15 for both follow-up visits). In addition, treatment-as-usual (TAU) patients were also recruited (3-month follow-up n=9; 6-month follow-up n=7). Patients completed a 10-minute driving simulator paradigm (STISIM Drive) at each study visit. Performance was assessed using repeated-measures analyses of variance.
Results: Following 3 months of MC treatment, patients demonstrated trends for improved driving performance relative to baseline on several variables. After 6 months of MC treatment, patients demonstrated significant improvements, including decreased center line crossings (p=.05) and less time spent out of lane (p=.05). In contrast, TAU patients demonstrated similar performance over time with no significant differences detected after 3 and 6 months relative to baseline.
Conclusions: MC patients demonstrated improved driving performance after 6 months of MC treatment, while performance in the TAU group was stable over time. Interestingly, previous analyses from this study have also shown similar patterns of improvement on objective measures of cognitive function. Although studies of recreational cannabis users demonstrate poorer driving performance, MC patients and recreational cannabis users report considerable differences in goals of use, product types, exposure to specific cannabinoids, and age of onset of use, which may explain these contrasting results. Given increasing numbers of MC patients, future studies should continue to examine impact of MC use on driving as these findings have significant public safety and policy implications.

W13. Cost Effectiveness and Service Utilization Outcomes of Motivational Interviewing to Reduce Alcohol and Cannabis Use Among Psychiatry Patients With Depression

Derek Satre[*1], Sujaya Parthasarathy[2], Kelly Young-Wolff[3], Meredith Meacham[1], Brian Borsari[4], Matthew Hirschtritt[3], Lucas van Dyke[3], Stacy Sterling[3]*
[1]University of California, San Francisco, [2]Kaiser Permanente Division of Research, [3]Kaiser Permanente Northern California, [4]San Francisco Veterans Affairs Health Care System
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Health Services
Abstract Category Original Research

Aim: Motivational Interviewing (MI) is a promising intervention for helping patients with mental health problems reduce their substance use. Examining cost-effectiveness (CE) of MI, and associations between MI and use of health services can inform appropriate intervention strategies for these patients.
Methods: Kaiser Permanente adult patients with depression symptoms (PHQ-9 score >5) seen in outpatient psychiatry (N=302) who reported unhealthy alcohol use or other substance use (primarily cannabis) were randomized to 3 sessions of MI (intervention) or printed literature (control) with telephone follow-up interviews at 6 and 12 months. CE analyses compared intervention costs associated with 30-day abstinence from unhealthy alcohol use (i.e., any days of ≥4/≥5 drinks for women/men) and cannabis use. Multivariable analyses examined associations between MI and healthcare utilization at 12 months (emergency department, primary care, psychiatry, and addiction treatment).
Results: MI resulted in greater likelihood of abstaining from unhealthy alcohol use (48.0% vs. 37.7%; $p<0.01$) and cannabis use (69.3% vs. 50.8%; $p<0.01$) than the control at 6 months, but outcomes did not differ at 12 months. For the MI group, 6-month CE ratios were $204-$268 per abstinent patient for unhealthy drinking and $149-$196 per abstinent patient for cannabis. There were no differences between groups on health service utilization.
Conclusions: Given the high cost of health care, it is important to examine cost-effectiveness of behavioral interventions to help inform resource allocation. We found that MI cost more than the control condition and was more cost effective for cannabis than unhealthy alcohol use; but MI had no relationship to utilization. Findings can inform implementation of substance use interventions through understanding MI's potential clinical and cost impact, and relationship to health services use.

W14. Cannabis Use Reduction Trajectories and Clinical Outcomes: An Exploratory Model

Jacob Borodovsky[*1], Michael Sofis[1], Brian Sherman[2], Kevin Gray[2], Alan Budney[1]*
[1]Geisel School of Medicine at Dartmouth, [2]Medical University of South Carolina
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: There is a need to develop reduction-based cannabis use endpoints to evaluate treatments for cannabis use disorder (CUD). This exploratory study characterized patterns of cannabis use reduction and corresponding changes in functional outcomes during treatment.
Methods: Secondary analyses of 16 weeks (4 pre-treatment weeks, 12 treatment weeks) of data (n=225) from both randomization arms of a clinical trial assessing pharmacotherapy for CUD. Cannabis use classes were extracted using latent profile modeling with two metrics measured during each of the 16 weeks: (1) past-week total days consumed (i.e., frequency) and (2) past-week average grams consumed per using day (i.e., quantity). Resulting classes were used in a negative binomial mixed effects model to predict changes in functioning as measured by the Marijuana Problem Scale (MPS) and Hospital Anxiety and Depression Scale (HADS).
Results: Analyses yielded five classes of cannabis use trajectories. Classes demonstrated distinct relationships between frequency and quantity and were subjectively characterized as: (1) "Gradual reducers", (2) "Non-responders", (3) "Frequency-focused reducers", (4) "Rapid reducers", (5) "Quantity-focused reducers". Combinations of cannabis frequency and quantity trajectories differed between classes, but within each class, patterns of change in frequency generally covaried with patterns of change in quantity. From baseline to Week 12, mean MPS scores declined by 87% (Class 1), 46% (Class 2), 63% (Class 3), 79% (Class 4), and 38% (Class 5). Classes with larger reductions in cannabis use demonstrated larger reductions in MPS scores. Changes in depression and anxiety were modest.
Conclusions: Self-reported cannabis use frequency and quantity appear to identify distinct cannabis reduction trajectories that correspond to changes in cannabis-related functional impairment. Because frequency and quantity metrics can delineate the direction and magnitude of change in cannabis-related functional impairment among subgroups of cannabis users, these metrics could potentially be used to construct new endpoints for CUD clinical trials.

W15. Race/Ethnicity Differences in the Associations Between Frequency of Cannabis Use, Depression, and Social Support: A Secondary Data Analysis

Lovelyne Julien[*1], Alina Shevorykin[2], Lesia M. Ruglass[3]*

[1]The New School, [2]Pace University, [3]The City College of New York, CUNY
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Racial/Ethnic Differences
Abstract Category Original Research
Aim: Studies indicate with increased legalization and reduced perceptions of harm; cannabis use has increased over time. Black and Latinx individuals report higher rates of cannabis use when compared to Whites. There is also a strong association between depression, social support, and cannabis use. Yet, few studies have examined the interrelationships among these variables. The aim of this study was to examine the associations among race/ethnicity, depression, social support, and cannabis use.
Methods: A secondary analysis of data from a parent study that examined cannabis cue reactivity in people with cannabis use disorders versus healthy controls. Depression was measured using the Beck Depression Inventory (BDI) and social support was measured using the Social Support Survey (subscales = emotional, tangible, affectionate, and positive social interaction).
Results: There were no significant differences in frequency of past 7-days cannabis use among the three race/ethnicity groups ($p > .05$). There was a significant positive correlation between frequency of past 7-days cannabis use and BDI total score for Black individuals ($n = 30$, $r = .59$, $p < 0.01$) and for White individuals ($n = 13$, $r = .66$, $p < 0.05$), but not for Latinx individuals ($n = 16$, $r = .34$, $p > .05$). There was a significant negative correlation between frequency of past 7-days cannabis use and overall social support for Latinx individuals $r = -.58$, $p = .019$. A Kruskal – Wallis test showed that affectionate support significantly differed by race/ethnicity, $H(2) = 9.27$, $p = .01$. Latinx individuals reported lower levels of affectionate support than Blacks (adjusted $p = .01$) and Whites (adjusted $p = .05$).
Conclusions: Depression and social support are differentially related to cannabis use among race/ethnicity groups. More research is needed to understand the reason for racial/ethnic differences in affectionate support and how that may impact frequency of cannabis use.

W16. Plasma Δ9-THC Levels and Subjective Effects After Smoked Cannabis: Relationships With Dopamine Release in Daily Cannabis Users

Katina Calakos[1], Heather Liu[1], Jon Mikael Anderson[1], David Matuskey[1], Yiyun Henry Huang[1], Evan Morris[1], Kelly Cosgrove[1], Ansel Hillmer[1]*
[1]Yale University
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: The primary psychoactive constituent of cannabis is Δ9-tetrahydrocannabinol (Δ9-THC), which may elicit its reinforcing effects through cannabinoid receptor-mediated disinhibition of the mesolimbic dopaminergic pathway. Our team is conducting a study measuring striatal dopamine release in response to smoked cannabis using positron emission tomography (PET) imaging with the dopamine D2/3 receptor antagonist [11C]raclopride. In this analysis, relationships between cannabis-induced physiological and subjective effects and measured dopamine response are explored.
Methods: PET data were analyzed from seven daily cannabis users (4F/3M, 28±4 years) for 90 min after bolus administration plus constant infusion (Kbol=105 min) of 584±95 MBq [11C]raclopride. Participants smoked a cannabis cigarette (0.9±0.1g, 3.7-5.6% Δ9-THC) 35 min after tracer injection. Blood samples were acquired immediately before and after smoking, and in 15-minute increments for one hour, to measure plasma Δ9-THC. Subjective "high" (scale: 0-10) was reported simultaneously. The linearized parametric neurotransmitter PET model (using cerebellum as the reference) was used to detect clusters >16 voxels of dopamine release. The model's estimated "γ" parameter reflects magnitude of dopamine release. Spearman's rank correlation coefficients were computed to explore associations of baseline and cannabis-induced change in plasma Δ9-THC concentration and subjective "high" with dopamine release (γ).
Results: Cannabis smoking increased plasma Δ9-THC levels (peak: 0-10 minutes) and subjective high (peak: 0-30 minutes). In these preliminary data greater baseline plasma Δ9-THC levels, indicative of recent cannabis use prior to study arrival, were significantly associated with lower γ estimates ($r=-0.97$, $p=0.01$). Greater cannabis-induced

percent change from baseline to peak Δ9-THC concentration was "trend"-level associated with higher γ (r=0.79, p=0.07). There was no evidence for relationships of subjective high and γ.
Conclusions: These data confirm that this experimental design elicits cannabis' subjective effects. We present preliminary evidence for higher pre-smoking Δ9-THC associated with less cannabis-induced dopamine release, and greater change in plasma Δ9-THC with greater dopamine release.

W17. Involvement of the Serotonin and Kappa Opioid Systems in the Discriminative Stimulus Effects of the Synthetic Cannabinoid AM8936

Laura Erwin[*1], Eve Frankel[1], Spyros Nikas[2], Alexandros Makriyannis[2], Carol Paronis[1]*
[1]Harvard Medical School/McLean Hospital, [2]Northeastern University
Abstract Detail Animal Study
Select Drug Category Cannabis/Cannabinoids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Synthetic cannabinoids (SCBs) have been described as producing 'THC-like effects', however, they also have been associated with negative effects including hallucinations, paranoia or anxiety, and seizures. The present experiments were based on the premise that hallucinogenic-like effects of SCBs may bear some similarities to the effects of other known hallucinogens, with effects mediated by 5-HT2a or κ-opioid receptors.
Methods: Drug discrimination procedures were used to determine the extent to which AM8936, a synthetic CB1R agonist, has subjective effects similar to 2,5-dimethoxy-4-iodoamphetamine (DOI; a 5HT2ac agonist) or U-69593 (κ opioid agonist). Three groups of Sprague-Dawley rats (n=8/group, mixed sex) were trained to discriminate either 0.18 mg/kg AM8936, 0.56 mg/kg DOI, or 0.32 mg/kg U-69593, from saline under a shock avoidance schedule of reinforcement.
Results: Cumulative doses of the respective training drug produced dose-dependent increases in drug-lever responding in each group of rats, with full substitution (> 90% of trials terminated by responding on the drug-associated lever) occurring at or below the training dose. In rats trained to discriminate AM8936, DOI dose-dependently increased drug-lever responding and produced ~76% of trials to the AM8936-associated lever; conversely, in rats trained to discriminate DOI, AM8936 produced ~80% of trials to the DOI-associated lever. U-69593 did not substitute in either AM8936- and DOI-trained subjects. In rats trained to discriminate U-69593, AM8936 resulted in ~30% of trials to the U-69593-associated lever and DOI produced ~21% of trials terminated by responses on the U-69593-associated lever.
Conclusions: Overall, the data suggest the κ opioid system does not share a substantial role in the discriminative stimulus effects of either AM8936 or DOI. However, the similarity between the discriminative stimulus effects of DOI and AM8936 suggests a substantial overlap and the relative importance the serotonergic system, 5HT2a in particular, could play in mitigating the hallucinogenic-like effects of potent synthetic cannabinoids.

W18. "Stop-And-Frisk" Experience Among Young Sexual Minority Men in New York City

Maria Khan[*1], Farzana Kapadia[2], Amanda Geller[3], Medha Mazumdar[1], Joy Scheidell[1], Kristen Krause[4], Richard Martino[5], Charles Cleland[1], Typhanye Dyer[6], Danielle Ompad[2], Perry Halkitis[4]*
[1]New York University School of Medicine, [2]New York University School of Global Public Health, [3]University of California Irvine, [4]Rutgers University School of Public Health, [5]Rutgers University Center for Health, [6]University of Maryland School of Public Health
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Criminal Justice
Abstract Category Original Research
Aim: Although racial/ethnic disparities in police contact are well documented, less is known about other dimensions of inequity in policing. Sexual minority groups may face disproportionate stop-and-frisk.
Methods: We used data from the P18 Cohort Study (Version 2) to measure levels, trends, racial/ethnic disparities, and correlates of self-reported stop-and-frisk experience among young sexual minority men (YSMM) (2014-2019). We compared per capita rates among P18 participants to rates calculated based on New York City Police Department (NYPD) reports.
Results: Over the study period, 43% reported stop-and-frisk with higher levels reported among Black (47%) and Hispanic/Latinx (45%) than White (38%) participants. Stop-and-frisk levels declined over time yet racial/ethnic

differences in levels persisted. We observed pronounced disparities in Black versus White stop-and-frisk rates particularly in neighborhoods with low or moderate levels of stop-and-frisk activity. The per capita rates among P18 participants calculated based on self-reported stop-and-frisk were much higher than rates calculated based on NYPD official counts. YSMM facing the greatest economic vulnerability and mental disorder symptoms were most likely to report stop-and-frisk. Among White respondents, levels of past year stop-and-frisk were markedly higher among those who reported past 30 day marijuana use (41%) versus those reporting no use (17%) while among Black and Hispanic/Latinx respondents stop-and-frisk levels were comparable among those reporting marijuana use (38%) versus those reporting no use (31%).
Conclusions: Findings suggest inequity in policing is observed not only among racial/ethnic but also sexual minority groups. Racial/ethnic YSMM, who are at the intersection of multiple minority statuses, face disproportionate risk including those who do not endorse behaviors that motivate stop-and-frisk (i.e., drug use). Because the most socially vulnerable experience disproportionate stop-and-frisk risk, we need to reach YSMM with community resources to promote health and wellbeing as an alternative to targeting this group with stressful and stigmatizing police exposure.

W19. Anxiety and Depression Associated With Cannabis Use Among Pregnant Women at First Prenatal Visit and Delivery

Mary Mitchell[*1], Katrina Mark[2]*
[1]Friends Research Institute, [2]University of Maryland
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: The aim of the study was to examine associations between cannabis use at initial prenatal visit and delivery with anxiety and depression at initial prenatal visit.
Methods: Abstracted data from 604 women presenting for prenatal care at a university-based women's health center in Baltimore, MD were analyzed. Urine toxicology screens indicated presence or absence of THC, indicating cannabis use, at initial prenatal visit and delivery. Generalized Anxiety Disorder scores and Edinburgh Postpartum Depression Scale scores were collected at initial prenatal visit. Data analyses were considered exempt from IRB approval because they were archival and anonymous.
Results: Two separate multinomial logistic regression analyses were used to examine associations between cannabis use group and anxiety, and cannabis use group and depression. Cannabis use groups were defined as having never used cannabis (negative urine toxicology screens at both time points; n = 383), quit using cannabis (positive urine toxicology screen at initial prenatal visit and negative screen at delivery; n = 151) and continuously using cannabis (positive at both time points; n = 70). Multinomial logistic regression analyses revealed that women with higher GAD-7 scores at initial prenatal visit had 2.55 times the odds of being in the continuous use group compared to the no use group (Adjusted Odds Ratio [aOR] = 2.55, 95% Confidence Interval [CI] = [1.31, 4.99]) and 1.75 times the odds (aOR = 1.75, 95% CI = [1.00, 3.06]) of being in the quit group than in the no use group.
Conclusions: Higher anxiety and depression scores were associated with significantly greater likelihood of being in the continuous use group than in the never used group, suggesting that cannabis use is a means of self-treating mental health symptoms, even after controlling for mental health diagnosis. Therefore, practitioners should be aware of screening pregnant women for both substance use and mental health concerns.

W20. Cannabis Use and Perceived Risk Among Pregnant Women in the U.S. by Trimester

Qiana Brown[*1], Hillary Samples[1], LaTrice Montgomery[2], Deborah Hasin[3], Cynthia Campbell[4], Stephen Crystal[1]*
[1]Rutgers, The State University of New Jersey, [2]University of Cincinnati, [3]Columbia University College of Physicians and Surgeons and New York State Psychiatric Institute, [4]Kaiser Permanente Northern California
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: Prenatal cannabis use (CU) is associated with neurodevelopmental and birth deficits; use is highest in the 1st trimester when risks of substance use are greatest for the developing fetus. However, perceived risk of CU has decreased, and may vary by trimester. We examined CU, perceived risk and trimester among pregnant women.

Methods: This cross-sectional study included pregnant women ages 12-44 (N=11,187) from the 2002-2014 National Survey on Drug Use and Health. Weighted proportions and logistic regressions (adjusted for trimester, age, race/ethnicity, poverty, education, survey year) were used to examine the relationship between perceived risk of smoking cannabis once per month and past month CU. Multiplicative interactions were tested between perceived risk and trimester.
Results: Of the 4.09% of pregnant women (n=678) who used cannabis, CU was highest in the 1st (53.97%) and 2nd (30.69%) trimesters vs the 3rd (15.34%); perceived risk was greater in the 1st (any risk: 57.21%; no risk 42.79%) and the 2nd (any risk: 58.96%; no risk 41.04%) trimesters vs the 3rd (any risk: 36.73%; no risk 63.27%). Among all pregnant women (N=11,187), perceived risk was negatively associated with CU and modified by trimester (interaction p=0.02). Adjusted odds of CU were more than 5 times higher for women who perceived no risk vs any risk in the 1st (OR=5.12; 95% CI = 3.45, 7.59; p<0.001) and 2nd (OR=5.25; 95% CI = 3.30, 8.35; p<0.001) trimesters, and more than 14 times higher in the 3rd trimester (OR=14.13; 95% CI = 7.04, 28.36; p<0.001).
Conclusions: Perceived risk is a significant correlate of prenatal CU, particularly in the 3rd trimester. Among users, CU was greatest in the 1st and 2nd trimesters when perceived risk was highest. This calls for a reexamination of prevention efforts, and for longitudinal studies assessing prenatal CU and perceived risk in greater depth.

W21. Psychological Distress and Substance Use Among Black Sexual Minority Cisgender Men and Transgender Women During the COVID-19 Pandemic

Raymond Moody[*1], Dustin Duncan[1], Liadh Timmins[1], John Schneider[2]*
[1]Columbia University Mailman School of Public Health, [2]University of Chicago
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Comorbidities
Abstract Category Original Research
Aim: Recent research suggests the COVID-19 pandemic has contributed to greater anxiety and depression symptoms as well as increased substance use in the general population. The study objective was to examine the association between psychological distress and substance use among Black sexual minority cisgender men and transgender women during the COVID-19 pandemic.
Methods: Participants involved in the ongoing N2 Cohort Study in Chicago were invited to participate in the N2 COVID-19 Study (n=226). Between April 20, 2020 and July 31, 2020, participants completed a survey that characterized psychological distress (anxiety, depression, somatic symptoms, and hopefulness) and substance use (e.g., alcohol use, tobacco use, and marijuana use) in the 14 days prior to taking the survey. Associations were analyzed using a series of multivariable logistic regressions.
Results: Among study participants, 73.5% reported at least one drinking day and 44.9% reported at least one binge drinking day (five or more drinks on the same occasion) in the previous 14 days. In terms of tobacco use, 41.6% of the sample reported at least one smoking day and 30.1% of the sample reported smoking every day in the previous 14 days. Most of the sample (71.2%) reported smoking marijuana at least one day in the previous 14 days. In multivariable analyses, anxiety and somatic symptoms were positively associated with alcohol use, tobacco use, and marijuana use (p<.05). Depression and hopefulness were not associated with substance use.
Conclusions: These data suggest high rates of substance use among Black sexual minority cisgender men and transgender women during the COVID-19 pandemic. In addition, the analysis suggests that as anxiety and somatic symptoms, but not depression symptoms, increase among Black sexual minority cisgender men and transgender women rates of substance use are also likely to increase. This suggests better resources are needed for anxiety and anxiety producing symptoms.

W22. Changes in Cannabis and Other Drug Use Among Cannabis-Using Young Adults in Los Angeles: Pre and Post-Legalization for Recreational Use

Stephen Lankenau[*1], Ekaterina Fedorova[1], Janna Ataiants[1], Bridgid Conn[2], Carolyn Wong[3]*
[1]Drexel University Dornsife School of Public Health, [2]Children's Hospital Los Angeles, [3]Children's Hospital Los Angeles and University of Southern California
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids

Topic Policy
Abstract Category Original Research
Aim: Significant drug policy change occurred in California in recent years with the legalization of cannabis for recreational use in 2016 and the start of cannabis sales for recreational use in 2018. Evidence is limited describing longitudinal patterns of cannabis and other drug use among cannabis-using young adults before and after these policy changes.
Methods: Young adults cannabis users (n=250) were surveyed in Los Angeles about cannabis and other drug use yearly from 2014-2020. The present analyses focus on wave 1 (2014-2015) and wave 5 (2019-2020), which reflect data collected before and after cannabis became legally available for purchase from cannabis dispensaries for recreational use. Within-person changes in medical cannabis patient status, cannabis use practices, and use of licit and illicit drugs were examined among this cohort pre- (2014-15) and post- (2019-20) legalization of cannabis for recreational use.
Results: The mean age of the cohort increased from 21.2 (wave 1) to 26.2 (wave 5). Significant declines in cannabis and other drug use were observed post-legalization: mean days of cannabis use (69.1 vs. 57.1, p<.001), prevalence of edible use (59.0% v. 36.5%, p<.001), driving under the influence of cannabis (59.5% vs. 50.4%, p<.01), medical cannabis patients (57.5% vs. 11.5%, p<.001), illicit drug use (31.4% vs. 25.0%, p<.05), prescription drug misuse (22.7% vs. 13.8%, p<.01), alcohol use (81.4% vs. 53.7%, p<.001), cigarette use (46.7 vs. 30.4%, p<.001). and e-cigarette use (29.5 vs 17.3%, p<.001). A trend toward increasing use of cannabis for medical purposes was observed post-legalization (24.3 % vs. 28.8%, p<0.1).
Conclusions: Despite increased access to cannabis through legalized dispensary sales, significant within-person declines in cannabis and other drug use were observed post-legalization within this cohort of young adult cannabis users. Further analyses should examine whether normative developmental declines in drug use and risk-taking impact these results.

W23. A Retrospective Chart Review Study of Cannabis and Ketamine-Assisted Psychotherapy for Trauma-Exposed Clients in an Outpatient Clinic

Yitong Xin[1], Pratheek Mangini[2], Alan Davis[1]*
[1]The Ohio State University, [2]Rutgers-Robert Wood Johnson Medical School
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Treatment
Abstract Category Original Research
Aim: Traumatic stress is widespread in today's society, contributing to substantial mental health problems, such as post-traumatic stress disorder (PTSD), depression, anxiety, and substance use disorders, as well as global disability in functioning. Several US states have approved the use of cannabis for medical use, and ketamine has garnered the Food and Drug Administration approval for the treatment of depression. However, very few studies have explored outcomes of these therapeutic approaches in real-world clinical settings. The present retrospective chart review study is the first of its kind to assess outcomes of ketamine and cannabis-assisted psychotherapy in trauma-exposed clients at an outpatient clinic.
Methods: De-identified clinical records of prospectively collected self-reported symptom measures were analyzed for clients with baseline probable PTSD and who completed at least six treatment sessions between 2018 and 2020 (N=35; Mage= 42.20, 49% female).
Results: Clients reported significant improvements in number of PTSD (p=.002; d=-.56) and mean intensity of PTSD (p=.002; d=-.56) symptoms, anxiety (p=.04; d=-.37) and insomnia (p<.001; d=1.13) symptoms, and global disability (p=.01; d=-.52). After six sessions of therapy those who received cannabis-assisted therapy (N=17) reported improvements in mean intensity of anxiety (p=.04; d=-.55) and insomnia (p<.001; d=1.71) symptoms, whereas those who received ketamine-assisted therapy (N=20) reported improved number of PTSD (p=.03; d=-.52) and mean intensity of PTSD (p=.03; d=-.52) symptoms, depression (p=.03; d=-.53) and insomnia (p=.01; d=1.02) symptoms, and level of global disability (p=.04; d=-.52). There were no further improvements between six and twelve sessions.
Conclusions: Ketamine and cannabis-assisted psychotherapy provides significant but heterogenous improvements in mental health symptoms and functioning among trauma-exposed clients in an outpatient clinic setting. Notably, symptom improvement occurs predominately in the first six sessions with a plateau in change found between

session six and twelve. Research in controlled laboratory settings is needed to elucidate the safety and efficacy of these treatments.

Virtual Poster Q&A Session III: Human

W24. Effects of Nicotine Concentration and Flavor on Subjective Responses to Use of the Juul System

Jack Henningfield[*1], Nicholas Goldenson[2], August Buchhalter[3]*
[1]Pinney Associates, Inc., [2]Juul Labs, Inc., [3]PinneyAssociates, Inc.
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: This laboratory study evaluated the subjective effects of the JUUL System ("JUUL"; Juul Labs, Inc.), a closed-system electronic nicotine delivery system (ENDS) with a nicotine-salt formulation, in two nicotine concentrations and four flavors among adult smokers and ENDS users.
Methods: Adult smokers (N=12) and exclusive ENDS users (N=12) completed an 8-arm within-subjects laboratory study over two days (N=24 total), using JUUL under controlled conditions (10 puffs over five minutes) according to a two nicotine concentration (5.0% [59 mg/mL] vs. 1.7% [20 mg/mL]) × four flavor (Virginia Tobacco, Mint, Fruit, Creme) randomized factorial design. Ratings of subjective effects were assessed with the modified Product Evaluation Scale (mPES) 30 minutes after the start of each product use session. The effects of nicotine and flavor on subjective effects were tested with multilevel linear models; smoking status (smoker vs. ENDS user) was also tested as a between-subjects moderator of nicotine and flavor effects.
Results: Across flavors, use of JUUL in 59 (vs. 20) mg/mL nicotine produced significantly higher ratings on the "Relief" subscale of the mPES (e.g., "Did it relieve withdrawal symptoms?"; "Was it enough Nicotine?"). Aggregated across nicotine concentrations, Mint, Fruit and Creme were all rated significantly higher than Virginia Tobacco on the "Satisfaction" subscale of the mPES. The effects of nicotine concentration and flavor were not moderated by smoking status. There were no significant main effects of smoking status for either "Relief" or "Satisfaction".
Conclusions: Use of JUUL in higher nicotine concentrations more effectively reduced withdrawal symptoms among smokers and ENDS users. Some smokers may require ENDS with nicotine concentrations greater than 20 mg/mL in order to reduce cravings and potentially transition away from cigarettes. Use of JUUL in non-tobacco (vs. tobacco) flavors were rated as more satisfying; there were no significant differences in the appeal of flavors by smoking status.

W25. Decision-Making and Daily Impact of COVID-19 as Predictors of Drug Use and Mental Health During the COVID-19 Pandemic

Amanda Devoto[*1], Salvatore Giorgi[1], Brenda Curtis[1]*
[1]NIH/NIDA-IRP
Abstract Detail Human
Select Drug Category Other, Marijuana and/or Alcohol use
Topic Behavioral Economics
Abstract Category Original Research
Aim: During the COVID-19 pandemic, people are potentially at risk for increased psychological distress and substance use. Delay discounting (DD), the decline in present value of a reward to the delay of its receipt, and sunk cost bias, the tendency to allow prior investments to influence future decision making, have previously been shown to be associated with substance use and poor psychological health, such as depression. The aim was to determine whether daily impact from the pandemic and decision-making indices were significantly related to mental health and drug use during the COVID-19 pandemic.
Methods: Participants (N=568) completed a baseline survey as part of a larger longitudinal study. Participants answered questions related to mental health (e.g., anxiety, depression, loneliness, and perceived stress), marijuana and alcohol use, and how the pandemic has impacted their life. Delay discounting and sunk cost tasks were also completed.

Results: Regression models were constructed to assess potential predictors of mental health, recent (last 30 days) marijuana use, and alcohol use. Daily life impact from the pandemic was a significant predictor ($p<.001$) of all mental health measures and alcohol use, but not recent marijuana use. Delay discounting (k) uniquely contributed to all mental health measures and recent marijuana use ($p<.05$), but not alcohol use. Sunk cost uniquely contributed to perceived stress ($p<.05$).
Conclusions: Those that are greater impacted by the COVID-19 pandemic have greater anxiety, depression, loneliness, stress, and use alcohol with greater frequency and severity than those less impacted. Impact of COVID-19 may not have been relevant for marijuana use due to using a binary measure (use or no use) rather than frequency of use. Delay discounting also uniquely relates to mental health as well as recent marijuana use.

W26. Comparative Efficacy and Acceptability of Pharmacotherapies for Alcohol Withdrawal Syndrome: A Systematic Review and Network Meta-Analysis

Anees Bahji[*1], Paxton Bach[2], Marlon Danilewitz[3], David Crockford[1], Emily Hawken[4], Robert Tanguay[1], Wiplove Lamba[3], Nady el-Guebaly[5]*
[1]University of Calgary, [2]British Columbia Centre on Substance Use, [3]Ontario Shores Centre for Mental Health Science, [4]Queen's University, [5]Foothills Medical Centre
Abstract Detail Human
Select Drug Category Cannabis/Cannabinoids
Topic Epidemiology
Abstract Category Original Research
Aim: Alcohol use disorders (AUD) cause substantial morbidity and early mortality yet remain greatly under-treated. Alcohol withdrawal syndrome (AWS)—a diagnostic indicator of AUD—commonly occurs on cessation of heavy and prolonged alcohol use. To date, there are few head-to-head trials of medication-based strategies for treating AWS. The aim of this study was to provide an updated evidence-based practice guideline on the pharmacological management of AWS.
Methods: We conducted a PRISMA-guided systematic review and network meta-analysis of English-language articles published until December 2020, identified through MEDLINE, PubMed, PsycINFO, EMBASE, ResearchGate, and Google via a search on "alcohol withdrawal" and review of references from identified articles. Two co-authors independently reviewed all records and extracted data in duplicate. Primary outcomes were withdrawal severity, delirium, seizures, completion of withdrawal, adverse effects, and tolerability to patients. Summary rate ratios (RRs) and standardized mean differences (SMDs) were estimated using pairwise and network meta-analysis with random effects.
Results: Identified citations (3,009) included 174 trials comprising 12,403 participants (males=9,754, 78.6%, median age: 43.0 years). Most trials occurred in inpatient detoxification units (n=142); however, some were conducted as outpatient (n=15), in the emergency department (n=7), in the intensive care unit (n=8), in mixed settings (n=2), or in post-operative care (n=1). There were 74 different treatments and 228 comparisons across trials, spanning primarily benzodiazepines and anticonvulsants. Across outcomes, benzodiazepines demonstrated consistent superiority for reducing AWS severity, duration of treatment, and alcohol withdrawal seizures. Across agents, chlorpromazine and promazine were the most poorly tolerated.
Conclusions: Our findings appear to suggest that symptom-triggered benzodiazepines seem to be the treatment of choice for the management of alcohol withdrawal when considering the composite perspective of both efficacy and tolerability. These results could serve evidence-based practice and inform patients, physicians, guideline developers, and policymakers on the relative performance of the different agents for treating acute alcohol withdrawal.

W27. A Network Analysis of Depression and Opioid Use Disorder (OUD) Symptoms and Their Relationship With Early-Relapse in Individuals Receiving Medication for OUD Treatment

Bo Hyun Kim[*1], Christopher Hammond[1], Ayisat Adegbindin[1], Grace Park[1], Kevin Wenzel[2], Marc Fishman[2]*
[1]Johns Hopkins University School of Medicine, [2]Mountain Manor Treatment Center
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Depressive symptoms and disorders commonly co-occur with opioid use disorders (OUD) and have complex relationships with OUD treatment outcomes. The links between these disorders are poorly understood. In the present study, we used network analysis to characterize associations between depression and OUD symptom networks and examine their relationship to early relapse to opioids in individuals receiving medication for OUD (MOUD) treatment.
Methods: Data from 570 adults diagnosed with OUD (169 females, mean age = 33.9 years) who participated in the NIDA-CTN-0051 trial, a 24-week open-label, randomized controlled, comparative effectiveness trial comparing extended-release naltrexone (XR-NTX) or buprenorphine-naloxone (BUP-NAL) for opioid relapse prevention, were used in the present study. Sparse network structures of 17 depression symptoms from the HAM-D and 11 OUD symptoms from the ASI-Lite were estimated at baseline (BSL) and end of treatment using Gaussian models of regularized partial correlations and LASSO. Local and global connectivity of network structures were compared across early-relapsers (n=96) and successful inductors (n=474) using permutation testing with qgraph and network comparison test (NCT) R-packages.
Results: In resulting baseline depression-OUD networks of early-relapsers, depression symptoms of weight loss, suicidality, and decreased work and activities and the OUD symptom of time spent using/recovering from opioids were the 4 most central symptoms. In contrast, the global network of successful inductors was more sparse with depressive symptoms having only weak associations, and OUD symptoms of time spent using/recovering from and giving up on social/recreational activities due to opioid use, opioid cravings and continued opioid use despite health problems being the most central symptoms. Network structures became sparser and less strongly connected over the 24-week treatment course in both groups.
Conclusions: Taken together, our preliminary results suggest that local and global connectivity of depression-OUD symptom networks are related to opioid relapse risk during MOUD treatment.

W28. A Latent Variable Approach to Sexual Orientation Concordance and Its Association to Substance Use Disorder Severity

Carol Boyd[*1], Sean McCabe[1], Rebecca Evans-Polce[1], Luisa Kcomt[1], Philip Veliz[1]*
[1]*University of Michigan School of Nursing*
Abstract Detail Human
Select Drug Category Other, Alcohol, tobacco, cannabis, other drug use disorders
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Using secondary data from the 2012-2013 National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III), we examined the protective effect of sexual orientation concordance (SOC) among sexual minorities and its association with the severity of alcohol (AUD), tobacco (TUD), cannabis (CUD), and other drug use disorders (ODUD). We also aimed to determine the limitations of examining SOC among bisexuals.
Methods: A sample of adults who sexually identified as gay/lesbian, bisexual or heterosexual with same-sex attraction and/or same-sex sexual behavior (n = 3,494) was used.
Measures: The SOC (latent construct) was determined with three manifest variables: sexual identity; attraction (to opposite-sex or same-sex); and sexual behavior (with opposite-sex or same-sex). The NESARC-III included measures that align with the eleven Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria for individual substance use disorders, with a higher score indicating greater severity. We employed structural equation modeling to assess latent constructs of SOC and observed severity of substance use disorders.
Results: For some groups, SOC was protective, although this varied by drugs. We also found sex differences. Generally, gay/lesbian SOC was associated with lower severity of CUD (IRR=.549, 95% CI=.307, .981), but not AUD, TUD or ODUD. Moreover, SOC among lesbians was associated with lower severity of TUD (IRR=.675, 95% CI=.475, .959) and ODUD (IRR=.549, 95% CI=.583, .066). Conversely, bisexuals with SOC were more likely to have a severe AUD (IRR=1.57, 95% CI=1.12, 2.22) and TUD (IRR=1.47, 95% CI=1.12, 1.93), although there were sex differences.
Conclusions: This study contributes to the growing literature demonstrating that bisexuals are at higher risk for substance use disorders, even those with SOC. While SOC appears protective for gay/lesbian identified individuals, this is generally not true for bisexuals. However, determining the appropriate manifest variables for SOC among bisexuals presented conceptual challenges, and will be highlighted in our discussion.

W29. Anabolic Androgenic Steroids Used as Performance and Image Enhancing Drugs (PIEDs) in Professional and Amateur Athletes: Toxicological Findings and Psychopathological Evaluation

Daria Piacentino[1], Gabriele Sani[2], Georgios Kotzalidis[3], Livia Longo[3], Simone Cappelletti[3], Lorenzo Leggio[1]*
[1]National Institute of Drug Abuse/NIH/DHHS, [2]Università Cattolica del Sacro Cuore, [3]Sapienza University of Rome

Abstract Detail Human
Select Drug Category Other, Anabolic Androgenic Steroids
Topic Comorbidities
Abstract Category Original Research

Aim: The use of anabolic androgenic steroids (AASs) as performance and image enhancing drugs (PIEDs) by professional athletes is well documented. AAS use is associated with physical and psychological adverse effects. The relationship between AAS use and psychopathology is complex. Here we describe the results of a multisite, cross-sectional study in fitness centers in Italy with professional and amateur athletes training in a variety of sports. The goal of this study was to detect the use of AASs and other substances in biological samples and their relationship with psychopathological features.
Methods: We recruited 122 athletes (age=18-45 years; females=38). They all completed semi-structured interviews, questionnaires, and toxicological examinations, i.e., blood, urine, and hair testing for AASs, other PIEDs (e.g., amphetamine-like substances, sympathomimetics), misused drugs (e.g., cannabinoids, opioids), and psychotropic medications (e.g., benzodiazepines).
Results: There was slight-to-moderate agreement among the three biological samples used for AAS testing (Fleiss' κ=0.251-0.474). There was slight agreement between toxicologically detected and self-reported (past month) use of AASs (N=31/122 vs. N=4/122, κ=0.114), as well as of other PIEDs, misused drugs, and psychotropic medications (κ=0.127-0.196). Sociodemographic, clinical, and psychopathological characteristics differing significantly between AAS users and nonusers were included in a backward stepwise regression. The following variables predicted AAS use (Nagelkerke's pseudo-R-squared=0.769): number of sport hours/week, SCID-II diagnosis, Hypomania Checklist-32, and Barratt Impulsiveness Scale-II. AAS users (N=31/122, 25.4%) trained for significantly more hours/week than nonusers. AAS users more likely presented SCID-II personality disorders (narcissistic and antisocial) and BIS-II nonplanning impulsiveness than nonusers. AAS users did not differ significantly from nonusers in major psychopathology, yet their HCL-32 total score was significantly higher.
Conclusions: Effective prevention policies need to focus on the several risk factors for AAS use, such as personality disorders, as shown by our study. Possible disagreements between AAS assessment methods should be considered when implementing harm reduction measures and surveillance programs.

W30. Correlates of Exclusive E-Cigarette Use and Other Tobacco Use Among Sexual and Gender Minorities in Texas

David Adzrago[1], Irene Tami-Maury[1], Vanessa Schick[1], J. Michael Wilkerson[1]*
[1]The University of Texas Health Science Center at Houston

Abstract Detail Human
Select Drug Category Other, alcohol, e-cigarette, and other tobacco products
Topic Epidemiology
Abstract Category Original Research

Aim: Sexual and gender minority (SGM) persons who are more likely to have a substance use disorder (SUD), mental health diagnosis (MHD), and use nicotine products more than persons who are cisgender and heterosexual. To inform intervention development, we used an SGM-only dataset that includes persons with SUD and MHD to examine the prevalence and correlates of exclusive e-cigarette use and other tobacco use.
Methods: We used data from a statewide online survey, Tell Us Texas, that included responses from 1273 SGM participants living in Texas. The analysis was based on tobacco use (N= 1103). Bivariate and multinomial logistic regression analyses examined the correlates of exclusive e-cigarette use, other tobacco products, and no tobacco use.
Results: Although cis women, compared to cis men, had the highest prevalence of no tobacco use, exclusive e-cigarette use, and other tobacco use, they had a lower expected risk of being other tobacco users (RRR= 0.67, 95% CI= 0.47, 0.97) compared to none tobacco users. The participants who received treatment for an SUD (RRR=

1.92, 95% CI= 1.75, 35.83 vs. RRR= 9.52, 95% CI= 3.14, 28.82) and those who used illicit drugs (RRR= 2.92, 95% CI= 1.84, 4.65 vs. RRR= 2.03, 95% CI= 1.45, 2.84) had higher expected risks of being exclusive e-cigarette and other tobacco users than none tobacco users, respectively. Those who self-reported PTSD diagnosis (RRR= 3.39, 95% CI= 1.82, 6.33) and in hazardous alcohol use (RRR= 2.26, 95% CI= 1.62, 3.15) had higher expected risks of being other tobacco users than none tobacco users, respectively.
Conclusions: SGM persons with a history of SUD and MHD who access treatment services are likely to use e-cigarettes and other tobacco products. Researchers should partner with treatment providers to develop and evaluate tailored interventions to reduce the burdens of tobacco use among SGM persons.

W31. Essential Medicines List for Asia Pacific Countries and the Deprivation of Medications for Substance Use Disorder Treatment

Arpit Parmar[1], Santanu Nath*[1]
[1]All India Institute of Medical Sciences Bhubaneswar
Abstract Detail Human
Select Drug Category Other, Multiple Drugs
Topic Policy
Abstract Category Original Research
Aim: To analyze the national lists of essential medicines (NLEM) of UN Asia Pacific countries to determine how many countries include substance use disorders (SUD) medications (Buprenorphine, Methadone, Naltrexone, Naloxone, Acamprosate, Disulfiram, Bupropion, Nicotine Replacement Therapy, and Varenicline)
Methods: A retrospective observational study was conducted using NLEM of all Asia Pacific countries. NLEM database, World Health Organization (WHO) repository, and other governmental sources were searched for the most recent NLEM. NLEMs from 54 Asia Pacific region countries were accessed, and details of SUD medications were extracted in December 2020. Descriptive analysis was performed using SPSS V20.0.
Results: The WHO essential medicine list 2019 contains 460 medications, including methadone (and buprenorphine), naloxone, and NRT. Of the 54 Asia Pacific region countries, 39 had their NLEM. The total number of medications ranged from 44 to 964 (median 289, IQR: 519-239). The countries contain a median of 220 medications (IQR: 260-177) from the WHO list. Of the nine medications for SUDs, the countries contained a median of 2 medications (IQR: 3.00-1.00). The most common medication available was naloxone (n=36, 92.3% countries). However, other medications were available scarcely. A total of 16 countries had at least one opioid use disorder medication, while 13 countries had at least one alcohol use disorder medication on their respective NLEMs. Only one out of four countries (n=10) had a tobacco use disorder medication on their list. Only four countries had at least one medication each for opioid, alcohol, and tobacco use disorders.
Conclusions: Except for naloxone, SUDs medications do not appear on the NLEM of most Asia Pacific region countries. There is a need to expand the NLEM of these countries, especially considering the high public health burden related to SUDs.

W32. Phenotype of Recovery: Delay Discounting Predicts Styles of Coping Among Individuals in Recovery From Substance Use Disorders

Devin Tomlinson[1], Allison Tegge[1], Warren Bickel[1]
[1]Fralin Biomedical Research Institute at VTC
Abstract Detail Human
Select Drug Category Other, Recovery from Substance Use Disorders
Topic Behavioral Economics
Abstract Category Original Research
Aim: Stress is associated with both substance use and relapse in Substance Use Disorders (SUDs). By understanding how individuals in recovery cope with stress, we can better understand the recovery process and inform treatments for SUDs. Delay discounting is associated with substance use, relapse, and treatment outcomes. Associations between coping and delay discounting have yet to be assessed in individuals in recovery from SUDs.
Methods: Data from 219 individuals in recovery recruited from the International Quit and Recovery Registry (IQRR) were used in the present analysis. Delay discounting rates were assessed using the adjusting amount delay discounting task. Individuals' coping styles were assessed using the COPE Inventory (COPE) and the Proactive Coping Inventory (PCI). A principal components analysis was performed for the 15 subscales of the COPE Inventory.

Results: The principal components analysis of the COPE Inventory resulted in three components. Delay discounting was a significant predictor of 7 subscales of the COPE (Positive Growth, Active Coping, Denial, Religious Coping, Behavioral Disengagement, Substance Use, and Planning) and 6 subscales of the PCI (Proactive Coping, Reflective Coping, Strategic Planning, Preventive Coping, Instrumental Support Seeking, and Emotional Support Seeking) when adjusting for demographic characteristics.
Conclusions: The present study indicates that delay discounting can predict coping styles in individuals in recovery. This information may aid in understanding, identifying, and assisting individuals that may need different, new, or more intensive interventions for their SUD.

W33. Associations Between COVID-19 Pandemic-Related Stress and Substance Use Problems

Erin Vogel[*1], Amy Chieng[1], Athena Robinson[2], Ken Weingardt[2], Sarah Pajarito[2], Judith Prochaska[1]*
[1]Stanford University, [2]Woebot Health
Abstract Detail Human
Select Drug Category Other, Varied
Topic Behavior
Abstract Category Original Research
Aim: The COVID-19 pandemic has produced major life disruptions and increased stress. We explored associations between pandemic-related stress and substance use problems.
Methods: Sample: Adults (N=180, 65% female, age M=40+12, 68% non-Hispanic white) with problematic substance use (CAGE-AID>1) were recruited online June–August 2020. Most (77%) were employed pre-pandemic; 15% lost employment, and 43% lived with children. Most (77%) identified problems with alcohol, followed by cannabis (28%); 45% identified multiple substances; 59% reported a lifetime mental illness. Measures: Measures included the 15-item Short Inventory of Problems–Alcohol and Drugs (SIP-AD), GAD 7-item anxiety measure, PHQ 8-item depression measure, 3-item measure of pandemic life disruptions, 6-item measure of pandemic-related mental health effects, and a 5-item measure of personal growth during the pandemic. Additionally, participants reported whether they frequented bars and attended large gatherings. Participants with children (<18) in the home completed a 4-item measure of pandemic-related worry about children's well-being. Most measures referenced the prior 2 weeks.
Results: Participants who struggled with responsibilities at home, had greater mental health impacts, greater personal growth, and frequented bars or large gatherings had higher SIP-AD scores (all p-values<.05). Participants who struggled with responsibilities at home, had difficulty getting necessities, had greater mental health impacts, and worried more about their children had higher GAD-7 and PHQ-8 scores (all p-values<.05). Additionally, participants who lost a job or income during the pandemic had higher PHQ-8 scores (p=.015). In multivariable analyses, greater mental health impacts were associated with higher SIP-AD, PHQ-8 and GAD-7 scores (all p-values<.05).
Conclusions: Experiencing worsened mental health symptoms during COVID-19 was associated with more substance use problems and depression and anxiety symptoms. Pandemic disruptions may exacerbate preexisting substance use problems.

W34. Two-Week Ambulatory Assessment of Craving as a Predictor of 5-Year Addiction Treatment Outcomes

Emmanuelle Baillet[*1], Fuschia Serre[1], Laura Lambert[1], Joel Swendsen[1], Melina Fatseas[1], Marc Auriacombe[1]*
[1]University of Bordeaux
Abstract Detail Human
Select Drug Category Other, Substance: opiate, alcohol, tobacco, cannabis
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Addiction is a chronic condition characterized by attempts to stop or reduce substance use followed by relapse. A main objective of addiction treatment is to prevent relapse by targeting craving, an unwanted and intense desire to use substances that constitutes a major risk factor for relapse. Craving may fluctuate considerably over a period of several hours and can be assessed in real time by Ecological Momentary Assessment (EMA). However, the predictive value of craving relative to addiction outcomes has only been studied over short periods of time (1 month to 2 years) whereas this disorder often follows a chronic course (5 to 10 years). To examine

whether craving levels at the initiation of treatment are associated with long-term outcomes (abstinence/non-abstinence).
Methods: Craving intensity was assessed 4 times per day by a two-week EMA study among participants initiating outpatient treatment for Substance Use Disorders (DSM-5) in a French addiction clinic. Subjects received a follow-up assessment 5 or more years after inclusion. Craving fluctuations and its association with 5-year outcomes were analyzed with Hierarchical Linear Models.
Results: Stronger decreases in craving intensity during the first two weeks of treatment was associated with more abstinence at 5 years (n=39; b=0.08; p=0.043).
Conclusions: Our results suggest that the craving trajectory at the beginning of addiction treatment may provide an important indicator of long-term treatment outcomes. This finding has potential implications for personalized treatment.

W35. Psychosocial Issues Among Women Who Use Illicit Drugs During Their Pregnancy

Heidi Melbostad[1], Roxanne Harfmann[1], Sarah Heil[1]*
[1]*University of Vermont*
Abstract Detail Human
Select Drug Category Other, Illicit drug use
Topic Prenatal/Perinatal
Abstract Category Literature Review
Aim: Comprehensive, multidisciplinary care is recommended for pregnant women who use illicit drugs because psychosocial issues common in this population, such as smoking, depression, and inadequate health care can complicate treatment of illicit drug use and because these psychosocial issues themselves independently contribute to adverse birth outcomes. Few facilities provide multidisciplinary care, perhaps in part due to the wide range of psychosocial issues possible. The aim of this study was to estimate the prevalence of different psychosocial issues among pregnant women who use illicit drugs compared to pregnant women more generally to help facilities better understand the scope of these problems.
Methods (Optional): We conducted a review of the literature using a systematic search strategy of PubMed, CINAHL, and Web of Science databases with the key words pregnancy, illicit drug use, and substance use for articles published from 2010 to November 2020. We manually reviewed each article found and extracted any prevalence data relevant to desire for pregnancy, tobacco and alcohol use, depression, stress, safety and interpersonal violence, barriers to care, unstable housing, and nutrition/food insecurity. We also identified the prevalence of these psychosocial issues among pregnant women in the general population; articles reporting US national data were used wherever possible, followed by review articles.
Results (Optional): Pregnant women who use illicit drugs experience 2- to 5-fold higher rates of unplanned pregnancy, smoking, depressive symptoms, stress, exposure to violence, barriers to care, homelessness, and food insecurity compared to pregnant women in the general population.
Conclusions: The psychosocial issues of pregnant women who use illicit drugs appear more pervasive compared to pregnant women in the general population. These issues are often unrecognized or underappreciated stressors in the lives of pregnant women. Clinical strategies that assess and remediate psychosocial stressors for women who use illicit drugs during their pregnancy may improve birth and maternal outcomes.

W36. Sociodemographic Correlates of Substance Misuse and Substance Use Disorder Among Primary Care Patients: Does Gender Matter?

Jacob Baylis[1], Elizabeth Charron[2], Nancy West[2], M. Aryana Bryan[2], Adam Gordon[3], Gerald Cochran[2]*
[1]*University of Utah School of Medicine,* [2]*University of Utah,* [3]*University of Utah School of Medicine and VASLCHCS*
Abstract Detail Human
Select Drug Category Other, Substance Use
Topic Sex/Gender Differences
Abstract Category Original Research
Aim: Understanding differences in substance misuse (SM) and substance use disorder (SUD) by gender and socio-demographics is critical for planning primary care (PC)-delivered substance use interventions. We examined gender differences in prevalence and socio-demographic correlates of SM and SUD among PC patients reporting past-year substance use.

Methods: We conducted a secondary analysis of data from a cross-sectional study that developed/validated a brief substance use screening instrument in PC settings. Past 12-month SM and SUD was measured using the Composite International Diagnostic Interview (CIDI). SM and SUD were defined as endorsement of 1 or >2 CIDI items, respectively. We calculated SM and SUD prevalence and predictors by gender using log-binomial regression models, adjusted for socio-demographics, to obtain adjusted prevalence ratios (aPR) and 95% confidence intervals (CIs).
Results: The sample included 820 women and 723 men reporting past-year substance use. Women were 17% and 27% less likely to report SM and SUD than men, respectively (SM: aPR=0.83, 95% CI=0.70-0.99; SUD: aPR=0.73, 95% CI=0.66-0.81). Among men, SM was less likely in individuals with a higher education degree compared to individuals with less than a high school degree (aPR=0.69, 95% CI=0.49-0.94). Among men and women, SM was more likely among individuals identified as never married than married (men: aPR=1.55, 95% CI=1.13-2.14; women: aPR=1.58, 95% CI=1.12-2.24). Among men, SUD was more likely among unmarried than married individuals (aPR=1.25, 95% CI=1.04-1.49). SUD was more likely among unemployed than employed men and women (men: aPR=1.20, 95% CI=1.01-1.42; women: aPR=1.37, 95% CI=1.06-1.77). Among men, SM was more likely for individuals identifying as other, non-Hispanic race/ethnicity than white, non-Hispanic race/ethnicity (aPR=1.59, 95% CI=1.10-2.29).
Conclusions: Education, marital status, race/ethnicity, and employment status were differential correlates of SM and SUD for men and women. Gender/socio-demographic-tailored clinical SUD prevention and intervention strategies are needed to deliver enhanced SUD care in PC settings.

W37. Heightened State and Trait Mindfulness is Associated With Success in Recovery

Sarah Lynn[1], Julia Basso[2], Liqa Athamneh[2], Warren Bickel[2]*
[1]Virginia Polytechnic Institute and State University, [2]Fralin Biomedical Research Institute at VTC
Abstract Detail Human
Select Drug Category Other, Substance use disorder
Topic Alternative Medicine
Abstract Category Original Research
Aim: Substance use disorders (SUDs) are chronic, relapsing-remitting disorders, with relapse rates estimated at 50%. Therefore, identifying factors that predict abstinence, remission, and overall success in recovery is an important area of research. Mindfulness, or the ability to calmly focus on and accept one's present thoughts and feelings, may be one way to enhance recovery outcomes. In a group of individuals in SUD recovery, we investigated whether state and trait mindfulness was associated with success in recovery as measured by remission status, craving level, future valuation, and quality of life.
Methods: Participants (N=345) were registrants of the International Quit and Recovery Registry (quitandrecovery.org) who are in recovery from SUDs. Participants completed a self-reported questionnaire that asked about substance use history, state and trait mindfulness, craving, delay discounting (DD), and quality of life (QOL). Participants were categorized utilizing the DSM-V criteria for SUDs and remission status. Data were analyzed with Pearson's correlations and independent samples t-tests.
Results: State mindfulness was significantly negatively associated with DD ($p<0.001$, $r=-0.253$) and positively associated with QOL ($p<0.001$, $r=0.479$). Trait mindfulness was significantly negatively associated with craving ($p<0.001$, $r=-0.311$) and positively associated with QOL ($p<0.001$, $r=0.540$). In a sub-group meeting DSM-V criteria for remission status (n=127), the strength of these relationships increased, with individuals in remission showing greater levels of both state ($t(343)=4.173$, $p<0.001$) and trait mindfulness ($t(183.712)=3.508$, $p=0.001$).
Conclusions: Our data suggest that a greater degree of mindfulness corresponds to greater success in recovery as assessed by remission status, decreased craving, increased future valuation, and enhanced quality of life. Engaging in practices to increase mindfulness may be an active path to achieving and maintaining remission from SUDs.

W38. Quit Discounting: Sensitivity to Health Messaging and Prediction of Substance Cessation

Justin Strickland[1], Derek Reed[2], Lauren Dayton[3], Carl Latkin[3], Matthew Johnson[1]*
[1]Johns Hopkins University School of Medicine, [2]University of Kansas, [3]Johns Hopkins Bloomberg School of Public Health
Abstract Detail Human

Select Drug Category Other, Alcohol and Cigarette Use
Topic Behavioral Economics
Abstract Category Original Research
Aim: Recent work shows that commodity-specific outcomes may improve the clinical utility of discounting measures. This study evaluated how the likelihood of alcohol or cigarette use cessation decreases with reduced probability of health benefit upon cessation (i.e., "quit discounting"). We examine how quit discounting: 1) varies by magnitude of health benefit, 2) is sensitive to public health messaging, and 3) predicts reductions in substance use.
Methods: Participants (N=485; 56.6% female) were recruited using crowdsourcing. Two quit discounting tasks were evaluated for hypothetical illnesses varying in severity (mild/severe; within-subject). Participants were also randomized to tasks with a matching mild/severe label or tasks without labels (between-subject). Measures were completed for cigarettes and alcohol as well as for sandwiches as a control commodity. The majority of participants (91%) completed a 3-month follow-up to assess changes in real-world substance use.
Results: We observed systematic reductions in quit likelihood with lower probabilities of health benefit. We also observed smaller reductions in quit intentions by probability of health benefit in the severe than mild task, and larger magnitude differences between the mild and severe tasks in the health label condition, p values < .05. Smaller reductions in quit intentions with reduced health benefit were predictive of prospective decreases in both cigarette and alcohol use. Relationships with substance related discounting remained after controlling for both cessation discounting for sandwiches and controlling for monetary delay and probability discounting.
Conclusions: These findings show that intentions to quit are systematically discounted by the probability of health benefit upon abstinence and that this discounting is sensitive to the severity of negative health outcome avoided and public health message framing about that severity. Importantly, sensitivity to health benefit was also predictive of reductions in real-world substance use signifying an individual difference variable that should be evaluated in clinical settings.

W39. Results From the Naloxone Awareness and Perceptions in Opioid Populations (NAPOP) Study

Zachary Kasper[*1], Matthew Ellis[1], Theodore Cicero[1]*
[1]*Washington University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research
Aim: Although those with opioid use disorder (OUD) are at elevated risk for overdose, naloxone may be beneficial to therapeutic populations at higher risk for opioid overdose. This study compared knowledge, awareness, and perceptions associated with opioid overdose and naloxone between two types of high-risk opioid-using populations.
Methods: An online questionnaire was distributed for a 1-month period in June 2020 to: an OUD arm (n=152) consisting of individuals with a history of OUD; and a chronic prescription opioid use (CPOU) arm (n=190) comprised of individuals diagnosed with chronic pain and currently treated with an opioid prescription (> 3 months and either >50 daily morphine milligram equivalent or co-use of a benzodiazepine), restricted by several confounders.
Results: The majority (73.2%) of CPOU patients were high-dosage users, and 52.6% co-used benzodiazepines. Risk perception varied between the two arms, with 60.0% (CPOU) versus 28.9% (OUD) reporting that they were "not at all concerned about overdosing," and 62.1% (CPOU) versus 19.1% (OUD) believing that they had "no risk" of opioid overdose.
In the CPOU and OUD arms, respectively, 75.3% versus 98.0% of patients were aware of naloxone. However, only 13.5% of CPOU patients considered themselves knowledgeable about naloxone, and only 47.1% indicated that they could recognize any symptoms of opioid overdose (vs 84.1% of OUD patients). Perceived need for naloxone was lower among CPOU versus OUD patients; 71.8% and 48.3%, respectively, believed they did not need to regularly keep naloxone, and 22.6% and 35.0%, respectively, indicated any likelihood of obtaining naloxone in the future.
Conclusions: These data suggest high-risk opioid user groups significantly differ in perceptions of overdose risk and naloxone. CPOU patients had low perceived overdose risk/concern, while both groups reported low perceived

need for, and likelihood of obtaining, naloxone. Changes in access/distribution of naloxone, and interventions surrounding naloxone education, need to consider differences in opioid-using populations.

W40. Pilot RCT of an eHealth Intervention to Improve ART Adherence in People With HIV who Use Substances

Karen Ingersoll[*1], Christina Frederick[1], Mahlatse Modipane[2], Ava Lena Waldman[1], Michelle Hilgart[3], Lee Ritterband[1], Rebecca Dillingham[1]*
[1]University of Virginia School of Medicine, [2]University of Limpopo, South Africa, [3]Consultant

Abstract Detail Human
Select Drug Category Other, stimulants, opioids, or hazardous alcohol use
Topic Technology (e.g., mHealth)
Abstract Category Original Research

Aim: We developed an eHealth intervention for drug use, hazardous alcohol use, stigma, social support, depression, and disclosure that undermine ART adherence. We discuss a pilot RCT comparing Pos4Health to online patient education on study feasibility, program acceptability, and impact on mechanisms of change, substance use (days using or drinking) and HIV clinical outcomes (ART adherence, viral load).
Methods: Pos4Health has videos featuring peers living with HIV, 6 interactive Cores metered out weekly, and online diaries of ART adherence and substance use. Study Feasibility, Program Acceptability and usage were compared to a priori benchmarks. Study recruitment was national due to good ART adherence and low rates of substance use at local clinics, necessitating changes in data collection.
Results: 69% of eligible applicants completed baselines, exceeding the a priori benchmark of 56%. Study completion rate exceeded the benchmark of 80%. Every program feature was rated highly. Users rated 64% of program utility items as mostly to very helpful. 18% completed 2 Cores; 55% completed 5-6 Cores. There were no group differences in knowledge, self-efficacy for ART adherence or reducing substance use, or motivation. Small improvements on ART adherence and non-drug use days in 30 did not differ by group. Pos4Health reduced drinking days, drinks per drinking day and binge drinking days; control participants showed no change. We were unable to determine if the intervention affected viral load due to difficulty obtaining labs.
Conclusions: Pos4Health exceeded benchmarks for Study Feasibility and Program Acceptability, but not Usage. The pilot RCT demonstrated significantly greater change by Pos4Health in alcohol use compared to control, but not drug use or adherence . We plan to revise the intervention for mobile devices, to drop less useful features, and to consider focusing on alcohol instead of drug use.

W41. Should Take Drug Again Emax Be the Primary Endpoint or One of Co-Primary Endpoints in Human Abuse Potential Study? – Sample Size Consideration

Ling Chen[*1]*
[1]US Food and Drug Administration

Abstract Detail Human
Select Drug Category Other, CNS drugs
Topic Policy
Abstract Category Theoretical/Commentary

Aim: In a human abuse potential (HAP) study, the primary endpoint is Drug Liking Emax. Usually Take Drug Again Emax is one of the key secondary endpoints. Recently, a question has been raised as to whether Take Drug Again Emax should be the primary endpoint or a co-primary endpoint with Drug Liking Emax in HAP studies. This is not a question for a statistician. However, the author's concern is on a practical issue, that is, what is the impact on the sample size of a HAP study if the answer of the question is yes. The author investigated Take Drug Again Emax based on 15 oral HAP studies submitted to the FDA for CNS drugs. The positive control drugs included in this research were amphetamine 40 mg, 1.5 and 3 mg doses of alprazolam, 15 and 30 mg doses of diazepam, dexmethylphenidate 80 mg, ketamine 100 mg, 45, 60 and 90 mg doses of phentermine, suvorexant 40 mg, and 15 and 30 mg doses of zolpidem.
Conclusions: If using Take Drug Again Emax as the primary endpoint or one of co-primary endpoints, the sample size for the validation test will be increased or the validation test of Take Drug Again Emax may fail. The increase of the sample size for the validation test implies the size of HAP study will also be increased.

W42. Digital Delivery of a Contingency Management Intervention for Substance Use Disorder: A Feasibility Study With Dynamicare Health

Mary Sweeney[1], Alexis Hammond[1], Tanyaradzwa Chikosi[1], Maxine Stitzer[2]*
[1]Johns Hopkins University School of Medicine, [2]Friends Research Institute

Abstract Detail Human
Select Drug Category Alcohol
Topic Technology (e.g., mHealth)
Abstract Category Original Research

Aim: Digital health tools can provide convenient delivery of evidence-based treatments. The DynamiCare Health smartphone app delivers a contingency management intervention for substance use disorder consisting of remote self-testing for alcohol (breath) and drugs (saliva) with remote test validation and delivery of financial incentives for negative test results. This study examined feasibility, engagement (duration and consistency of app utilization) and impact on usual care treatment participation when this digital therapy was implemented among patients enrolled in a community substance use treatment program.
Methods: Patients with alcohol use disorder (N=61) were randomly assigned to receive either DynamiCare along with treatment-as-usual (TAU; N=29) or TAU only (N=32) during a 90-day evaluation period.
Results: Mean duration between first and last app use was 64 (±35) days with mean earnings of $248 (±$209, out of $600 maximum). Among those with any app use (n=25), compliance was 68% and 74%, respectively for requested breath and saliva samples. Overall, two thirds of patients (66%) assigned to the app used it for at least 57 days and with high rates of self-testing compliance. High satisfaction ratings were endorsed by those completing the assessment (N=13; 45% of sample). DynamiCare versus TAU participants were more likely to be retained in usual care treatment at 90 days (24% vs 3%; ($\chi 2(1, 61) = 5.9$, $p < 0.05$), but sustained app utilization was associated with a wide range of usual care treatment participation.
Conclusions: These data suggest that DynamiCare Health is feasible and potentially beneficial as a complement to community substance use treatment programs.

W43. When is a Relative Risk Estimate Not a Relative Risk Estimate? Fundamental Male-Female Variations in Drug Epidemiology

Olga Vsevolozhskaya[1], James Anthony[2]*
[1]University of Kentucky, [2]Michigan State University

Abstract Detail Human
Select Drug Category Other, Methods Research
Topic Epidemiology
Abstract Category Original Research

Aim: Recent contributions to the CPDD journal, Drug and Alcohol Dependence, disclose some confusion about the concept of ‘relative risk’ (RR) versus the separate concept of ‘odds ratio’ (OR). We aim to use algebra to show that RR estimates are not the same as OR estimates, and we produce novel estimates from recent epidemiological surveys to show the importance of drawing distinctions in research on sex as a biological variable (SABV) and on gender-focused studies.
Methods: The study population consists of the non-institutionalized civilian residents of the United States (US), age 12 years and older, as sampled each year, 2002-2017, for the National Surveys on Drug Use and Health (NSDUH), and assessed using audio computer-assisted self-interviews (n>50,000 each year). All measurements are from standardized survey items. All RR and OR estimates are analysis-weighted, with Taylor series variances.
Results: We start by presenting figures that show a visual representation of the epidemiological and biostatistical distinctions between (a) ‘becoming a case’ (incidence and risk) versus ‘being a case’ (prevalence) and (b) ‘incidence’ versus ‘risk’ versus ‘odds,’ as well as estimated ‘relative risk’ versus ‘odds ratios.’ The algebra developed by others, by itself, shows that an RR estimate often will not be the same as an OR estimate. Our empirical estimates provide tangible illustrations. s
Conclusions: The distinctions between RR and OR have a previously demonstrated solid mathematical foundation (via algebra). If ignored, these distinctions get in the way of effective scientific communication. The empirical estimates of this project may help us to understand what is an evolving pattern of sex/gender variations as we seek to understand the changing epidemiology of

W44. Negative Non-Deployment Emotions Longitudinally Associated With Drug Use Among Never-Deployed Reserve Soldiers: Differences by Drug Type and Sex

Rachel Hoopsick[*1], D. Lynn Homish[1], Schuyler Lawson[1], Gregory Homish[1]*
[1]State University of New York at Buffalo

Abstract Detail Human
Select Drug Category Other, Nonmedical use of prescription drugs and illicit drug use
Topic Epidemiology
Abstract Category Original Research

Aim: Among never-deployed soldiers, feelings of guilt, and decreased value, camaraderie, and connectedness within their unit are prevalent. Prior research has shown that these non-deployment emotions (NDE) are cross-sectionally associated with hazardous drinking for male, but not female, US Army Reserve/National Guard (USAR/NG) soldiers. However, it is not known if these findings generalize to drug use or when examined longitudinally – the focus of the current study.
Methods: A subset of data (N = 182 never-deployed soldiers) were drawn from Operation: SAFETY (Soldiers and Families Excelling Through the Years), an ongoing survey-based study of USAR/NG soldiers. We used bootstrapped GEE models to examine the longitudinal relationship between NDE and any current drug use at three time points over a 2-year period, controlling for current clinically significant symptoms of depression (yes/no). To understand if there were differences by drug type, we examined the longitudinal relationships between NDE and current nonmedical use of prescription drugs (NMUPD) and current illicit drug use, separately. Finally, we added an interaction term to each of these models to examine if these relationships differed according to sex.
Results: Our adjusted main effects model showed no association between NDE and current drug use ($p > 0.05$). However, after separately examining these relationships by drug type and testing for interactions by sex, results show that greater NDE were longitudinally associated with a greater likelihood of current NMUPD among male, but not female, soldiers ($p < 0.05$). NDE were not associated with current illicit drug use among male or female soldiers ($p > 0.05$).
Conclusions: Findings demonstrate that NDE may contribute to ongoing NMUPD among male USAR/NG soldiers who have never been deployed. All military service members, regardless of deployment status, could be at risk for substance use problems. Therefore, we recommend universal and routine screening for substance use, including NMUPD.

W45. Predictors of Treatment Engagement in Women With Comorbid PTSD and SUD Enrolled in a Randomized Controlled Trial of Mindfulness-Based Relapse Prevention Interventions

Vanessa Somohano[*1], Makenzie Irrgang[2], Aurora Newman[2], Maya O'Neil[1], Travis Lovejoy[1], Kristin Mackiewicz Seghete[3]*
[1]VA Portland Health Care System, [2]Pacific University, [3]Oregon Health & Science University

Abstract Detail Human
Select Drug Category Other, Multiple primary drug use categories
Topic Treatment
Abstract Category Original Research

Aim: Upwards of 60% of women in substance use disorder (SUD) treatment meet criteria for posttraumatic stress disorder (PTSD) and demonstrate the poorest rates of treatment completion and outcomes compared to men and women with either disorder alone. Concurrent treatment of PTSD and SUD is clinically indicated as these interventions have demonstrated efficacy for both disorders over time compared to treating each disorder separately; however, high dropout rates remain a significant problem. Identifying predictors of treatment engagement may inform intervention modifications that help to improve retention and minimize dropout in difficult-to-reach populations.
Methods: The current study analyzed secondary data from a cluster-randomized controlled trial to identify predictors of treatment engagement as measured by receiving the minimal effective dose (i.e., two or more intervention sessions) for an 8-session Mindfulness-Based Relapse Prevention (MBRP) group intervention. Women with comorbid PTSD/SUD (N = 83) enrolled in inpatient or outpatient SUD treatment received either a trauma-integrated adaptation of MBRP or standard MBRP. Logistic regression models identified potential predictors of treatment engagement, which included race and ethnicity, treatment setting (inpatient vs. outpatient), and validated measures of substance craving and PTSD symptom severity measured at baseline.

Results: Logistic regression analyses revealed that greater severity of substance craving (OR = 1.11, 95% CI [1.01, 1.21]) and trauma-related arousal/reactivity (OR = 1.29, 95% CI [1.03, 1.61]) predicted greater likelihood of receiving a minimal effective treatment dose; race, treatment setting, and other PTSD symptom clusters (avoidance, changes in mood/cognitions, intrusions) were not significantly associated with treatment engagement.
Conclusions: Contrary to findings in predominately male populations, women with PTSD-SUD are more likely to engage in treatment when experiencing more severe craving and trauma-related arousal. Future studies should examine ways to engage women with clinically significant but more mild forms of SUD and PTSD in evidence-based treatments.

Virtual Poster Q&A Session III: Nicotine/Tobacco

W46. Did Asthma Emergency Department Visits Depend on Electronic Smoking Device Availability in California Counties from 2013 to 2016?

Alexander Perlmutter[*1], Luis Segura[1], Silvia Martins[1], Chris Morrison[1]*
[1]*Columbia University*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Policy
Abstract Category Original Research
Aim: To examine whether changes in the availability of ESDs in tobacco retail outlets in California counties was associated with a change in asthma ED visits from 2013 to 2016.
Methods: Outcome data were obtained from the California ED and Patient Discharge Datasets. Exposure data was obtained from the California Department of Taxation and Fee Administration, the California Healthy Stores for a Healthy Community Survey, and US Census county population estimates. Covariate data came from the American Community Survey and the Behavioral Risk Factor Surveillance System. County-level changes in age-adjusted asthma ED visits per 100,000 residents from 2013 to 2016 for each California county were obtained. They were regressed on county-level changes in tobacco retailers selling ENDS per 100,000 residents and adjusted for relevant covariates (N=56).
Results: A 10-unit county-level increase in tobacco retailers selling ENDS per 100,000 residents from 2013 to 2016 was associated with a 13.5-unit increase in county-level asthma ED visits during the same period (95% confidence interval: 2.2–24.9) per 100,000 residents, adjusted for covariates. Results were unstable as counties with small populations were removed at several cutoffs.
Conclusions: Relative to their populations, increases in California counties' tobacco retailers selling ENDS were associated with increases in asthma ED visits over time. California limits alcohol outlet density, but not tobacco outlet density. Regulating the density of tobacco outlets where ENDS are available may help to decrease the burden of asthma emergencies in California.

W47. Examining Antepartum Quit Attempts Using a Latent Factor Model of a Hypothetical Cigarette Purchase Task

Carolyn Evemy[*1], Joan Skelly[2], Norman Medina[1], Allison Kurti[1]*
[1]*University of Vermont,* [2]*Vermont Center on Behavior and Health*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavioral Economics
Abstract Category Original Research
Aim: To examine the latent-factor structure of a hypothetical Cigarette Purchase Task (CPT) in a national sample of pregnant smokers using a Principle Component Analysis (PCA) and to characterize the relationship between the latent factors of Amplitude and Persistence to antepartum quit attempts relative to conventional predictors of antepartum quit attempts.
Methods: Participants were a national sample of 664 pregnant women seeking to enroll in a smartphone-based smoking-cessation trial. Data were taken from an intake assessment that examined demand using the CPT, antepartum quit attempts, pre-pregnancy and antepartum smoking characteristics, and sociodemographics. Bivariate analyses compared sociodemographics, behavioral economics, and smoking characteristics of women who did vs. did not report at least one quit attempt in the current pregnancy. PCA was used to assess whether the

five CPT indices (Intensity, Omax, Pmax, Breakpoint, Alpha) loaded onto two latent factors (Amplitude & Persistence). Finally, backward elimination stepwise regression was used to predict antepartum quit attempts using all significant variables in the bivariate analyses including CPT latent factors.
Results: There was a two-factor solution to CPT; Intensity loaded exclusively on Amplitude and all other indices on Persistence. As CPD antepartum and Amplitude were highly correlated, the stepwise regression was conducted excluding CPD. The variables retained in the model were: Amplitude, TTFC antepartum, quit attempts pre-pregnancy, whether the participant's cigarette of choice contained menthol, age at smoking initiation, age at intake, Persistence, and race/ethnicity (all ps=<.05).
Conclusions: These results demonstrate that CPT latent factors Amplitude and Persistence are significantly associated with antepartum quit attempts. These results further the support for generality and translatability of the PCA latent factors in multiple populations in lieu of the more traditional purchase task demand indices.

W48. Tobacco Use Among Substance Use Disorder (SUD) Treatment Staff: Association With Tobacco Use and Tobacco Services Among Clients

Elana Straus[1], Thao Le[1], Sindhushree Hosakote[1], Joseph Guydish[1]*
[1]University of California, San Francisco, School of Medicine
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Despite high rates of smoking among people in residential substance use disorder (SUD) treatment, few receive tobacco cessation services. Little is known about how tobacco use among staff may impact this disparity. This analysis explored the relationship between staff tobacco use and client tobacco use, and the relationship between staff tobacco use and tobacco-related services reported by both staff and clients.
Methods: Staff (n = 363) and clients (n = 639) in 24 California publicly funded residential SUD treatment programs were surveyed in 2019-20. Staff self-reported current tobacco use, as well as their beliefs, self-efficacy, and practices regarding smoking cessation. Clients reported their tobacco use and services received while in treatment. Regression analysis, adjusting for Medicaid coverage and program tobacco policy, analyzed the association between staff and client tobacco use and other outcomes at the program level.
Results: Use of any tobacco product by staff ranged from 0% to 100% by program, with an average of 32% across programs. Adjusted analyses found that staff tobacco use is positively associated with client tobacco use and negatively associated with client receipt of cessation counseling. At programs with higher rates of staff tobacco use, staff had lower self-efficacy to address smoking and held more negative views towards clients quitting smoking while in treatment.
Conclusions: Higher rates of staff tobacco use were associated with high rates of client tobacco use, and with fewer clients receiving tobacco-related counseling. Efforts to reduce tobacco use among SUD clients may be reinforced by efforts to support tobacco cessation among treatment staff.

W49. Benzodiazepine Misuse and Cigarette Smoking Among U.S. Adults: National Survey on Drug Use and Health (NSDUH) 2015-2018

Juhan Lee[1], Katie Lindstrom[1], R. Kathryn McHugh[2]*
[1]University of Florida, [2]McLean Hospital
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Epidemiology
Abstract Category Original Research
Aim: Benzodiazepines are the third most commonly misused drugs in the U.S. population. There is a growing public health concern of recent increases in benzodiazepine-related overdose deaths, emergency department visits, and treatment admissions. Although benzodiazepine misuse often occurs as a pattern of polydrug use, little is known about the association between benzodiazepine and cigarette smoking, particularly at the national level.
Methods: We used a pooled dataset from the National Survey on Drug Use and Health (NSDUH) 2015-2018 (N=171,766). We conducted a multivariable logistic regression model on past-year benzodiazepine misuse as a function of current tobacco use (cigarette smoking, other tobacco use), controlling for survey years,

sociodemographics (e.g., age, sex, race/ethnicity, SES indicators), past-month substance use (e.g., alcohol, cannabis, other drugs), opioid use disorder and psychiatric comorbidities (e.g., distress, depression).
Results: Among the analytic sample (N=171,766), 2.9% (weighted; unweighted n=4,942) reported they misused benzodiazepine in the past 12 months. In the multivariable logistic regression model, risk factors of past-year benzodiazepine misuse were past-month cigarette smoking (vs. no) (aOR=1.60, 95% CI=1.42, 1.81), female (vs. male) (aOR=1.22, 95% CI=1.10, 1.34), having an income level more than $75,000 (aOR=1.17, 95% CI=1.03,1.33), uninsured (aOR=1.17, 95% CI=1.01, 1.36), past-month use of alcohol (aOR=1.46, 95% CI=1.29, 1.65), cannabis (aOR=2.36, 95% CI=2.09, 2.67), other illicit drug use (aOR=13.93, 95% CI=12.22, 15.88), past year distress (aOR=1.78, 95% CI=1.52, 2.09), depressive symptoms (aOR=1.47, 95% CI= 1.26, 1.72) and opioid use disorder (aOR=3.53, 95% CI=2.79, 4.45).
Conclusions: Nicotine is independently associated with benzodiazepine misuse, even controlling for other drug use and psychiatric variables. Future studies examining potential mechanisms linking nicotine and benzodiazepine use are needed.

W50. Smoking Reduction is Associated With Lower Alcohol Consumption and Depressive Symptoms Among Young Adults

Juliet Yonek[*1], Meredith Meacham[1], Danielle Ramo[2], Martha Shumway[1], Marina Tolou-Shams[1], Derek Satre[1], Derek Satre[3]*
[1]University of California, San Francisco, [2]Hope Lab, Inc., [3]Kaiser Permanente Northern California
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Comorbidities
Abstract Category Original Research
Aim: This secondary analysis examined whether reduction in smoking among young adults participating in a Facebook-based smoking and alcohol intervention was associated with corresponding reductions in alcohol consumption and depressive symptoms.
Methods: Participants were young adults who smoked cigarettes and engaged in heavy episodic drinking (HED) (N=179). At baseline and 12-month follow-up (N=150), participants completed The Alcohol Use Disorders Identification Test-Consumption (AUDIT-C), The Patient Health Questionnaire-2 (PHQ-2) and reported past-month number of cigarettes smoked per day (CPD) and days of HED. Linear regression analyses estimated the relationship between the mean change in CPD and mean changes in the AUDIT-C, days of HED, and the PHQ-2.
Results: The number of CPD, AUDIT-C score, days of HED, and PHQ-2 score were significantly lower at 12 months compared to baseline. The mean reduction in CPD was significantly associated with the mean reduction in AUDIT-C (β=0.09, 95 % CI 0.04-0.14), days of HED (β=0.17, 95 % CI 0.04-0.29) and PHQ-2 (β=0.05, 95 % CI 0.01-0.08). At 12 months, abstinence (n=48) was associated with a significantly larger reduction in AUDIT-C (mean=-2.9 points, 95% CI -3.5 to -2.2) compared to a ≥50% reduction in CPD (n=45) (mean=-1.7 points, 95% CI -2.5 to -1.1 and <50% reduction in CPD from baseline (n=57) (mean=-1.1 points, 95% CI -1.7 to -0.5). The mean reduction in days of HED and PHQ-2 did not vary by the level of smoking reduction.
Conclusions: Smoking reduction was associated with reductions in alcohol consumption and depressive symptoms. Reductions appeared to be greater for those who achieved abstinence compared to any level of reduction in smoking. Further research is needed to clarify the relationship between the level of smoking reduction and alcohol consumption and depressive symptoms.

W51. The Relation Between the Brief Wisconsin Inventory of Smoking Dependence Motives, Individual Differences in Nicotine Consumption, and the Relative Reinforcing Value of Cigarettes in Vulnerable Populations of Smokers

Kaitlyn Browning[*1], Michael DeSarno[1], Danielle Davis[2], Joanna Streck[3], Cecilia Bergeria[4], Roxanne Harfmann[1], Maria Parker[5], Sarah Heil[1], Stacey Sigmon[1], Diann Gaalema[1], Jennifer Tidey[6], Dustin Lee[4], John Hughes[1], Haley Tetreault[1], Catherine Markesich[1], Stephen Higgins[1]*
[1]University of Vermont, [2]Yale University School of Medicine, [3]Massachusetts General Hospital/Harvard Medical School, [4]Johns Hopkins University School of Medicine, [5]Indiana University, [6]Brown University
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Tolerance/Dependence

Abstract Category Original Research
Aim: Nicotine dependence severity is a strong predictor of smoking cessation. The Brief Wisconsin Inventory of Smoking Dependence Motives (B-WISDM) is a well-validated, multidimensional measure of dependence severity comprised of four primary-dependence-motives (PDM) subscales and seven secondary-dependence-motives (SDM) subscales, wherein PDM significantly predicts smoking cessation and SDM does not. The purpose of the present study was to elucidate these dependence motives by determining the relation between B-WISDM items and potential underpinning behavioral processes.
Methods: Data were obtained from 745 adult smokers with co-morbid psychiatric conditions or socioeconomic disadvantage enrolled in a study on reduced-nicotine-content cigarettes. In addition to the B-WISDM, participants completed a Cigarette Purchase Task (CPT), which models the relative reinforcing value of cigarettes and cigarette demand under escalating prices with results expressed as two latent factors: Amplitude (demand unconstrained by price) and Persistence (price sensitivity). Participants also provided blood samples to determine combined cotinine and 3'-hydroxycotinine (COT+3HC) levels as a measure of nicotine consumption. Multiple regression was used to determine the B-WISDM items that accounted for independent variance in COT+3HC and the relation between these items and CPT factors.
Results: The four PDM subscales (Automaticity, Loss of Control, Craving, Tolerance) were significantly correlated with COT+3HC (ps<.001), whereas the SDM subscales were not. Of the 16 PDM items, five items that were from the Loss of Control, Tolerance, and Craving subscales independently predicted COT+3HC and accounted for 28% of the variance in individual differences. Regarding relative valuation, these dependence motives were more strongly associated with Amplitude (R2=.25) than with Persistence (R2=.09).
Conclusions: Overall, these results suggest that these dependence motives may be characterized in terms of nicotine consumption and demand Amplitude. Further, these results suggest a need for interventions that more effectively target Amplitude to reduce smoking in vulnerable populations.

W52. Characterizing Symptoms of E-Cigarette Dependence: A Qualitative Study of Young Adults

Kelsey Simpson[*1], Afton Kechter[1], Sara Schiff[1], Jessica Braymiller[1], Nausoke Yamaguchi[1], Rachel Ceasar[1], Jessica Barrington-Trimis[1]*
[1]*University of Southern California*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Tolerance/Dependence
Abstract Category Original Research
Aim: While rates of e-cigarette use ('vaping') continue to potentiate concern, there is limited data on common symptoms of e-cigarette dependence among young adults who vape. This study sought to critically explore how young adults experience, manifest, and conceptualize vaping dependence symptoms in their everyday lives.
Methods: Between June 2018 and 2019, in-depth qualitative interviews were conducted with 62 young adults who use e-cigarettes (aged 18-25) living in Southern California. We explored participants' product preferences, daily e-cigarette use patterns, vaping history, withdrawal experiences, and quit attempts or periods of cessation. We used a thematic analysis approach to interpret the transcripts.
Results: Young adults discussed nine dimensions of vaping dependence that were organized into two categories: 1) general nicotine dependence symptoms, and 2) unique dependence symptoms related to vaping. Nicotine dependence symptoms included cravings and urgency to use, increased use to achieve desired effects, and unsuccessful quit attempts and withdrawal. Symptoms unique to vaping dependence included greater nicotine consumption due to accessibility and lack of restrictions, habitual vaping, inability to track vaping frequency, immediate gratification and comfort, social acceptability and norms, and awareness of vaping dependency.
Conclusions: In addition to nicotine dependence symptoms that have been characterized for other tobacco products, young adult e-cigarette users also demonstrate unique symptoms of vaping dependence that necessitate the need for more refined measures. All dimensions of vaping dependence should be considered in discussions of policies as well as treatment and education efforts intended to protect young people from e-cigarette dependence.

W53. Differential Effects of Intranasal Oxytocin on Generosity During Acute Cigarette Smoking Abstinence

Rajiv Sheth[*1], Paddy Loftus[1], Matt Kirkpatrick[1]*

[1]*University of Southern California*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Existing evidence suggests that acute smoking abstinence disrupts socioemotional processing, which may contribute to relapse. In this study with non-treatment seeking smokers, we examined whether generosity (i.e., one index of socioemotional processing) is disrupted by acute abstinence and whether intranasal oxytocin (OT: a hormone involved in social behavior and drug reward) attenuates those disruptions.
Methods: Adult smokers (N=64; both sexes) completed a baseline session and three experimental sessions. At baseline, non-abstinent smokers completed the Welfare Tradeoff Task (WTT), in which participants make several decisions about whether they (Self) or Other-Person (friend or stranger) will receive varying hypothetical sums of money. Generosity was operationally defined as the switch-point (i.e., the Self:Other-Person monetary ratio at which a participant moves from prioritizing personal welfare to that of another person [most generous=1.45, least generous=–0.35]). Experimental sessions occurred after 12-hour smoking abstinence and consisted of inOT (20, 40 IU) or placebo administration followed by the WTT. Analyses tested generosity across non-abstinent (baseline) versus abstinent (experimental sessions) trials, as well as dose-dependent effects of inOT during abstinence.
Results: There was a main effect of abstinence on generosity ($F(1,2794)=20.6$, $p<0.001$) such that participants were less generous when abstinent (Mean 0.43 ± 0.05) compared to non-abstinent (Mean 0.50 ± 0.05). During abstinence, there was an inOT by Other-Person interaction on generosity ($F(2,1955)=8.3$, $p<0.001$), such that inOT increased generosity towards a friend (40 IU: Mean 0.65 ± 0.06 versus placebo: Mean 0.59 ± 0.06) and decreased generosity towards a stranger (40 IU: Mean 0.26 ± 0.06 versus placebo: Mean 0.32 ± 0.06).
Conclusions: This investigation provides further evidence of smoking abstinence-induced disruptions in social functioning, as well as context dependent effects of inOT. Researchers should further examine the interactions between inOT, generosity and smoking outcomes, including withdrawal and relapse during cessation attempts.

W54. Prenatal Tobacco Exposure on Brain Morphometry and Cognitive Measures in the Adolescent Brain Cognitive Development (ABCD) Cohort

Pedro Rodriguez Rivera[*1], *Christine Cloak*[1], *Huajun Liang*[2], *Thomas Ernst*[3], *Linda Chang*[1]
[1]*University of Maryland School of Medicine,* [2]*University of Maryland,* [3]*University of Hawaii and Queen's Medical Center*
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Imaging
Abstract Category Original Research
Aim: Prenatal tobacco exposure (PTE) is associated with poorer cognitive function and sex-specific effects on brain morphometry and cognitive development. However, the specific brain regions affected, and the extent of the sex-specific effects remain unclear. We aimed to evaluate brain and neurocognitive measures in a large cohort of boys and girls with and without PTE.
Methods: Baseline data from the ABCD study was assessed, including structural magnetic resonance imaging (sMRI), NIH Toolbox® neurocognitive measures, PTE status, daily-cigarette-exposure during pregnancy, and sociodemographic information. sMRI from children (ages 9-10 years) with (n =194) and without (n=4,202) PTE were processed by the ABCD-Data Analysis and Informatics Center using Freesurfer. Two-way analyses of covariance were conducted to examine the main and sex-specific effects of PTE on brain morphometry and cognitive measures, while covarying for age, parental education and ABCD site.
Results: Compared to the unexposed children, PTE children tended to have thinner superior frontal gyri ($p=0.09$), and poorer working ($p=0.03$) and episodic memory ($p=0.03$). Regardless of PTE, girls performed better than boys on episodic memory ($p=0.04$); had smaller total brain area ($p<0.0001$) and volume ($p<0.0001$); and had thinner lingual gyri ($p=0.01$) but thicker anterior cingulate cortices (rostral-$p=0.002$, caudal-$p=0.03$) than boys. Sex-specific effects of PTE were found in the superior parietal (interaction-$p=0.04$) and middle temporal cortices (interaction-$p=0.001$) when PTE was measured as the daily-cigarettes-exposed during pregnancy. Compared to their unexposed counterparts, PTE-boys had thinner and PTE-girls had thicker superior parietal and middle temporal cortices.

Conclusions: Our results indicate that PTE has sex-specific effect on brain development, with boys being more vulnerable than girls. Future analyses will include a larger sample and longitudinal data to further evaluate the sex-specific effects of PTE on neurodevelopmental trajectories and will assess the possible mediating role of sex hormones on these measures.

W55. The Experimental Tobacco Marketplace: Effects of Low-Ventilated Cigarette Exposure

Roberta Freitas-Lemos[*1], Allison N. Tegge[1], Jeffrey S. Stein[1], Sarah A. Reisinger[2], Peter G. Shields[2], Dorothy K. Hatsukami[3], Warren K. Bickel[1]*
[1]Fralin Biomedical Research Institute at Virginia Tech Carilion, [2]The Ohio State University and James Cancer, Comprehensive Cancer Center, [3]University of Minnesota, Masonic Cancer Center and Department of Psychiatry and Behavioral Sciences
Abstract Detail Human
Select Drug Category Nicotine/Tobacco
Topic Behavioral Economics
Abstract Category Original Research
Aim: The tobacco marketplace is constantly changing with new products and regulations. The FDA has the authority to regulate filter ventilation and such policy will change the relative reinforcing value of products resulting in nicotine/tobacco users facing the explore/exploit dilemma (i.e. choice between a familiar or an unfamiliar option). This study examined the effects of price increases in higher-ventilated cigarettes (HVC) and successive exposure to lower-ventilated cigarettes (LVC) on explore/exploit patterns of tobacco-product purchasing in the Experimental Tobacco Marketplace (ETM).
Methods: In a within-subjects design, HVC smokers (n=20; 55% males) completed one assessment session and three ETM sessions alternated with LVC exposure. In each ETM session, participants were provided an experimental income to make seven days of tobacco-product purchases as the price of HVCs increased across trials. Purchasing patterns of tobacco products were modeled using a mixed-effects logistic regression.
Results: The results showed that prohibitive prices of HVCs decreased the likelihood of HVCs purchases ($p<0.001$) and increased the likelihood of LVC purchases ($p<0.001$). Furthermore, initial exposure to LVC decreased the total number of cigarettes purchased when HVC prices were high ($p<0.001$) and increased exploration of alternative tobacco products ($p<0.001$). However, successive exposure decreased the likelihood of HVCs and alternative product purchases and increased the likelihood of LVCs purchases ($p=0.001$ in session 2), while maintaining similar proportions of budget spent across sessions.
Conclusions: This study suggests that regulating filter ventilation may decrease the relative reinforcing value of HVCs and initially increase exploration of alternative tobacco products. However, repeated exposure may increase the reinforcing value and exploitation of LVCs. As the tobacco landscape continues to rapidly evolve, policy-makers should take advantage of this transition period when smokers seek information on unfamiliar products to implement harm reduction strategies, such as provide education about the relative risk of alternative products and promote the use of nicotine replacement therapy.

Virtual Poster Q&A Session III: Opiates/Opioids

W56. Effect of Methylone Pre-Exposure on MDPV and Fluoxetine-Induced Conditioned Taste Avoidance

Hayley Manke[*1], Katharine Nelson[1], Anna Vlachos[1], Jacob Bailey[1], Karina Maradiaga[1], Tania Weiss[1], Kenner Rice[2], Anthony Riley[1]*
[1]American University, [2]National Institute of Drug Abuse, National Institutes of Health
Abstract Detail Animal Study
Select Drug Category Club/Designer Drugs
Topic Substance Use Disorder
Abstract Category Original Research
Aim: The abuse potential of a drug is thought to be a balance of its rewarding/aversive effects, and several subject (e.g., sex) and experiential (e.g., drug history) factors impact this affective balance. In this context, new psychoactive substances such as the synthetic cathinones are being examined to characterize their aversive and rewarding effects. As noted, preexposure to a drug has been reported to attenuate its own (and others') aversive

effects, shifting the affective balance to reward. The present study assessed the effects of preexposure to methylone, a first-generation synthetic cathinone that serves as a substrate releaser for DA and 5-HT, on taste avoidance induced by the synthetic cathinone MDPV and the antidepressant fluoxetine that preferentially increase DA and 5-HT levels, respectively.
Methods: Male Sprague-Dawley rats (n = 48) were exposed to vehicle or methylone (10 mg/kg IP) every 4th day for a total of five injections prior to taste avoidance conditioning in which a novel saccharin solution (1 g/L) was paired (five times) with MDPV (1.8 mg/kg IP) or fluoxetine (10 mg/kg IP). Data in this study was analyzed using a mixed model ANOVA with statistical significance set to 0.05.
Results: In vehicle pre-exposed animals, MDPV and fluoxetine induced conditioned taste avoidance relative to animals injected with vehicle during conditioning ($p < 0.05$). Methylone pre-exposure attenuated the avoidance induced by MDPV but had no effect on fluoxetine-induced avoidance ($p < 0.05$).
Conclusions: That methylone preexposure attenuated the aversive effects of the DA reuptake inhibitor MDPV suggests that methylone's actions on DA likely mediate its (and MDPV's) aversive effects That avoidance induced by the 5-HT substrate releaser fluoxetine was unaffected by methylone preexposure is consistent with this possibility. Together, these results suggest that drugs with common neurochemical substrates likely interact to impact abuse potential.

W57. Addressing the Opioid Overdose Crisis in Milwaukee County, Wisconsin Using Multiscale Geospatial Modeling

Amir Masoud Forati[*1], Rina Ghose[1], John Mantsch[2]*
[1]University of Wisconsin - Milwaukee, [2]Medical College of Wisconsin
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research
Aim: To investigate racialized health disparities in Milwaukee County, Wisconsin, we examined opioid overdose determinants. Over the past 16 years, the United States has experienced a dramatic increase in deaths due to OUD making it the leading cause of deaths from unintentional injury in the country. The overall aim of this study is to accurately capture determinants of opioid overdose and how the effects of these determinants vary across the urban environment and different communities to guide more effective population-level interventions.
Methods: We obtained data with multiple, high-quality measures of socio-economic, public health status, and demographics to provide a novel analysis of opioid overdose rate determinants by employing a multiscale modeling approach (Multiscale Geographically Weighted Regression; MGWR) while demonstrating current best practices for building, interpreting, and reporting results for the model. By doing so, this research overcomes the limitations of previous work and establishes a methodology for carrying out similar studies in the future. In particular, this study concentrated on analyzing datasets to examine overdose patterns and variabilities across Milwaukee County in 2019.
Results: Analyzing 225 potential variables, the model was able to explain 83% of opioid overdose death variability in different neighborhoods in hyper-segregated Milwaukee County using 15 selected variables. This process helped to identify critical indicators of vulnerability that determine OUD risk and opioid overdose. Patterns, trends, and clusters were statistically analyzed using MGWR and visualized. Our findings unveil dramatic racialized health disparities in Milwaukee. Most notably, while the Narcan program, which aimed at distributing naloxone among communities, was relatively successful at managing the epidemic among the majority white population, it was not successful at controlling the opioid epidemic among certain marginalized minorities in Milwaukee County.
Conclusions: These findings support the need for community targeted policies and interventions guided by multiscale geospatial modeling in order to more effectively address the opioid crisis.

W58. Reference Point Setting in Opioid Use Disorder

Alexandra Mellis[*1], Oluwatobi Olufeko[1], John Rotrosen[1], Paul Glimcher[1]*
[1]New York University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavioral Economics

Abstract Category Original Research
Aim: The value of a reinforcer is assessed not only based on the reward it delivers, but also whether that reward is better or worse than expected. In decision-theoretic terms, this expectation is the "reference point", and has been linked to dopaminergic tone. Using a behavioral measure, we determined reference points in opioid use disorder (OUD) patients and controls. Our hypotheses were that patients with OUD would show depressed reward expectations, and that opioid agonist therapy would acutely elevate expectations.
Methods: Patients receiving methadone treatment for OUD (n=13) completed two behavioral sessions, one scheduled prior to daily methadone administration and one scheduled following. Control participants (n=11) with no history of substance use disorder completed one session. In a sequential "patch foraging task," participants chose between "exploiting" a depleting reward supply or taking the time to find a fresh source of rewards. Reward supply quality varied in alternating blocks of high-reference and low-reference, which systematically varied the time at which an optimal decision-maker would abandon a depleting patch as no longer worth exploiting. We compared the average reward threshold of these switches, a measure of the reference point.
Results: All participants demonstrated environment-sensitive reference point setting, with higher thresholds in rich environments than in poor environments ($B = 1.45$, $p < 0.001$). Overall, OUD participants demonstrated lower expectations than controls ($B = -1.53$, $p = 0.043$). Among patients, increased expectations ($B = 0.62$, $p < 0.001$) were observed following methadone administration, narrowing the gap between patients and controls.
Conclusions: Patients receiving treatment for OUD show lower reference points than controls. These differences were reduced shortly after methadone administration at therapeutic doses. This suggests that opioid agonist therapies may serve not only to mitigate craving and withdrawal, but also mitigate decision-making pathology associated with OUD.

W59. Cost-Effectiveness of Extended-Release Naltrexone Opioid Use Disorder Treatment Prior to Release From Incarceration: Preliminary Result

Ali Jalali[1], Philip Jeng[1], Sabrina Poole[2], Frank Vocci, Jr.[3], Danielle Ryan[1], Michael Gordon[3], George Woody[2], Daniel Polsky[2], Sean Murphy[1]*
[1]Weill Cornell Medical College, [2]University of Pennsylvania, [3]Friends Research Institute
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: To evaluate the cost-effectiveness of extended-release naltrexone (XR-NTX) opioid use disorder (OUD) treatment, administered prior to release from incarceration, vs. referral to community-based OUD pharmacotherapy.
Methods: A prospective economic evaluation conducted alongside a randomized controlled trial where participants with OUD who were incarcerated were randomized to XR-NTX pre-reentry (n=74) vs. referral to community-based OUD pharmacotherapy (n=72). The incremental cost-effectiveness ratio was used to assess cost-effectiveness for three stakeholder perspectives at 12- and 24-week periods: state policymaker, healthcare sector, and societal. Effectiveness measures included quality-adjusted life-years (QALYs) and time abstinent from opioids (abstinent years). Resources were categorized as OUD-and non-OUD medical, state transfers, and other societal. Resources were valued according to perspective, and predicted mean values were estimated for each category and effectiveness measure, using longitudinal multivariable generalized linear models (GLMs). Missing data were accounted for via multiple imputation (MI) within the GLM. Confidence intervals were subsequently estimated using nonparametric bootstrapping. Incremental cost-effectiveness ratios (ICERs) were calculated for each time frame and perspective, as were cost-effectiveness acceptability curves to display uncertainty.
Results: XR-NTX was associated with greater OUD-related costs, but cost differences across other categories were statistically insignificant. QALYs gained were also statistically insignificant between arms; however, XR-NTX was associated with 15.5 more days of opioid abstinence over 24 weeks. For the QALY effectiveness measure, the highest likelihood of XR-NTX cost-effectiveness was 65% at 12 weeks from the State policymaker perspective, using the highest recommended willingness-to-pay value of $200,000/QALY. For the abstinent-year effectiveness measure, XR-NTX could be considered cost-effective with 95% confidence at 12- and 24-weeks using willingness-to-pay values >$49,200/abstinent-year, across all perspectives. Relatively short follow-up and large proportion of missing data were important limitations in the study.

Conclusions: XR-NTX administered pre-reentry to persons who are incarcerated with OUD may provide value for stakeholders and bridge a well-known treatment gap for this vulnerable population.

W60. Providing Access to Medications and Other Treatment for Opioid Use Disorder in a District Court: Lessons Learned From the First Year of Implementation

Amelia Bailey[*1], Samantha Hano[1], Kene Orakwue[1]*
[1]*University of Massachusetts*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: The District Court in Holyoke, Massachusetts, is among the first courts nationwide to provide access to medications for opioid use disorder (MOUD) and other evidence-based treatment during court appearances and afterwards. Founded in March 2020, the program uses a multi-sectoral approach to serve a primarily Latinx population living in communities of concentrated poverty. We describe the first year of program planning and operation.
Methods: We conducted 15 semi-structured individual interviews in 2020 with program planners, i.e., court staff, medical and behavioral healthcare staff, law enforcement and corrections, and peer recovery groups. We also documented program planning through observation of weekly meetings and review of reports and published materials. We identified resolution of expected challenges, COVID-19 adaptations, facilitators of program planning, and anticipated benefits.
Results: During program planning, key partners focused on resolving the expected challenges of conducting synchronous screenings, treatment assessments, and linkages to community based MOUD. Topics included: defining new collaborative responsibilities, scheduling, security, and COVID-19 mitigation; information exchange between the court and treatment providers; technical infrastructure; processes to assess program success while abiding by participant confidentiality; and engagement of vulnerable populations, distrust of public institutions, Spanish language preferences, and social determinants of health. Partners shared that program planning was facilitated by the ability to achieve common understanding of program goals, cross-sector buy-in, and communication. Anticipated program benefits included increased access to MOUD; fewer overdose events; and strengthened collaboration between the criminal justice system, healthcare, and community-based agencies.
Conclusions: Establishment of a MOUD-in-court program involves significant organizational change and detailed planning. Future efforts will assess implementation, outcomes, and lessons learned, to determine whether the program is a feasible intervention that can be adopted by other court-based settings.

W61. The Primary Kratom Alkaloid Mitragynine as an In Vivo Adrenergic-Alpha2 Receptor Agonist in Rats

Avi Patel[*1], Samuel Obeng[1], Luis Restrepo[1], Lea Gamez-Jimenez[1], Nicholas Ho[1], Francisco Leon[1], Marco Mottinelli[1], Christopher McCurdy[1], Lance R. McMahon[1], Takato Hiranita[1]*
[1]*University of Florida*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: The primary kratom alkaloid mitragynine has received attention due to its μ-opioid receptor (MOR) activity; additionally, the antinociceptive effects of mitragynine in mice were blocked by the adrenergic-α2 receptor (Aα2R) antagonist idazoxan.
Methods: Here we examined the Aα2R pharmacology of mitragynine with radioligand receptor binding in human cell membranes and drug discrimination, the hot plate test (antinociception), and measurement of rectal temperature in rats.
Results: The affinity of mitragynine at human MOR (Ki=706 nM) was 2- to 10-fold higher than its affinity at other opioid (k and d) and adrenergic (a2A and a2C) receptors. In rats discriminating mitragynine (32mg/kg, i.p.) from vehicle, MOR agonists (morphine, fentanyl, and methadone), Aα2R agonists (lofexidine and clonidine), and Aα2R antagonists (yohimbine and atipamezole) produced up to 84%, 74%, and 40% drug-lever responding, respectively. In rats discriminating morphine (3.2mg/kg, i.p.) from vehicle, morphine, fentanyl, and methadone

produced at least 98% drug-lever responding, and mitragynine produced up to 72% drug-lever responding. Lofexidine, clonidine, yohimbine and atipamezole produced a maximum of 30% drug-lever responding. In the hotplate (52°C) test, morphine, fentanyl, and methadone produced at least 90 % maximum possible effects, whereas MG was ineffective. Lofexidine and clonidine produced up to 63% maximum possible effects, and yohimbine and atipamezole produced up to 85% maximum possible effects in the hot plate assay. Rectal temperature was decreased by 0.3°C for the MOR agonists, 1.0°C for MG, up to 4.8°C for the Aα2R agonists, and up to 3.4°C for the Aα2R antagonists. Yohimbine and atipamezole antagonized the discriminative stimulus effects of mitragynine but not the discriminative or antinociceptive effects of morphine. Both lofexidine and clonidine potentiated mitragynine discrimination but not the discriminative or antinociceptive effects of morphine.
Conclusions: These results suggest that mitragynine exerts its in vivo effects via dual agonism at μ-opioid and adrenergic-α2 receptors

W62. How Does Treatment Delivery Format Impact the Patient Treatment Experience?

Ariel Hoadley[*1], Courtney DelaCuesta[1], Augustine Kang[1], Rosemarie Martin[1]*
[1]Brown University
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Program Descriptions
Aim: The availability of OUD treatment delivery formats has changed to adhere to COVID-19 mitigation guidelines. In conjunction with relaxed regulations around MOUD, OUD treatment providers (OTPs) are able to remotely induct patients onto buprenorphine and provide counseling via telehealth. CODAC Behavioral Healthcare, a community-based OTP with seven treatment sites in Rhode Island, has implemented these changes, including the migration of counseling services to a telehealth platform. To understand how the transition to telehealth counseling services has impacted patients, a quality improvement project was conducted.
Methods (Optional): Through web-based and paper surveys collected between July and October 2020, 275 patients receiving telehealth counseling services were asked about changes to their treatment experiences and the overall helpfulness of sessions for addressing their substance use and recovery. Patients' ages ranged from 21 to 71 years (M = 41.7, SD = 10.2) and 49% were female. Chi-square tests were used to examine the associations between the helpfulness of sessions and indicators of the patient treatment experience.
Results (Optional): Satisfaction with telehealth counseling was high, with 93% either somewhat satisfied or very satisfied with telehealth services and 82% wanted to continue telehealth alone or in combination with in-person counseling services in normal operations. Increased helpfulness for telehealth counseling sessions was significantly associated with improvements in comfortability, convenience, and therapeutic relationships relative to no change in the treatment experience (ps < .01). Barriers to accessing telehealth services, such as cost and limited privacy for counseling sessions, were not significantly associated with changes to the helpfulness of sessions.
Conclusions: Overall, the acceptability of telehealth counseling services was high among this sample. It also appeared feasible to achieve the relational components of OUD counseling when services were delivered via telehealth.

W63. Racial and Ethnic Disparities in MOUD Treatment in a Carceral Setting

Augustine Kang[*1], Justin Berk[2], Jennifer Clarke[3], Nicole Alexander-Scott[3], Rosemarie Martin[1]*
[1]Brown University School of Public Health, [2]Brown University, [3]Rhode Island Department of Health
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research
Aim: Health disparities exist at the intersection of correctional health and addiction medicine. Communities of color are disproportionately affected by incarceration and these disparities extend into Opioid Use Disorder (OUD) and OUD treatment. Considering that release from incarceration is associated with a significantly higher risk of death from opioid overdose, engagement with medications for OUD (MOUD) while incarcerated is an effective method of mitigating post-release overdose mortality among the population. However, it is currently

unclear if there are race and ethnicity differences in MOUD treatment uptake. Hence, we sought to examine if race/ethnicity disparities exist in MOUD treatment uptake.
Methods: We examined incarceration and medication records for 2,134 individuals who screened positive for OUD incarcerated at the Rhode Island Department of Corrections (RIDOC) between January 2017 and April 2020. Race and ethnicity data were obtained from RIDOC and a community health organization (CODAC Behavioral Healthcare) in Rhode Island. Using chi-square and logit analysis, we examined race and ethnicity differences in MOUD uptake (i.e. newly inducted on MOUD vs. previously on MOUD) and specific medication type.
Results: 52.3% of the sample were newly inducted on MOUD. Our sample was 91.0% White, 6.6% Black, and 2.4% other races (Asian/Native American/Multiracial), and 12.3% were Latinx. Our main findings were that: (1) White participants were more likely to have been previously on MOUD compared to Black participants (p=.019), (2) White participants were more likely to be newly inducted on MOUD compared to Black participants (p=.007), and (3) Non-Latinx were more likely to be newly inducted on MOUD than Latinx (p<.001).
Conclusions: Our results indicate that there may be greater MOUD uptake in carceral settings among White and non-Latinx populations. Further research is needed to identify antecedents to potential racial/ethnic inequities in MOUD uptake and access.

W64. Agent-Based Model of Opioid Interventions in North Carolina and the Use of Synthetic Populations to Represent Local Communities

Georgiy Bobashev[*1], Michael Duprey[1], James Rineer[1], Emily Hadley[1], Rainer Hilscher[1], Jessica Cance[1]*
[1]RTI International
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: As the opioid epidemic evolves, prompt understanding and evaluating the effectiveness of multiple interventions is a challenge that could be addressed with predictive modeling. The Aim of the study is to evaluate the effects multiple policies have on opioid use careers and outcomes in North Carolina with NIDA-funded predictive simulation models.
Methods: We developed an agent-based model that simulates communities in North Carolina and the impact of interventions on opioid careers of individuals in these communities. We use RTI-developed synthetic populations representing every person in North Carolina. These synthetic individuals can initiate opioid use and then follow a variety of drug careers. Outcomes include misuse, overdose and overdose mortality. Our predictive simulation models evaluate potential “What if” intervention scenarios and understand interplay of a plethora of available interventions covering prevention (e.g. opioid prescription practices), treatment (e.g. availability of buprenorphine treatments) and harm reduction (e.g. naloxone distribution). We use public data from the NC DHHS and national studies.
Results: Our studies show that the effects of multiple PDMP components on overdose mortality are likely to be substantial but will be seen in the long-term (5-10 years). Availability of different treatment modalities will be effective in the short to intermediate period (1-3 years), and effect and naloxone is short-term (<1 year) but has it's limitations. At the same time, there are critical knowledge and data gaps about intervention effects that are being uncovered through the process of model development.
Conclusions: Our simulations reinforce the notion that multiple interventions are needed to effectively address opioid epidemic. These interventions also need to be cognizant of the evolutions in social and intervention environment. The lack of availability of high-quality data results in the use of strong assumptions which in turn affects the uncertainty especially of the long-term projections.

W65. Factors Associated With Delivery of Emergency Department Harm Reduction and Addiction Treatment

Brendan Jacka[*1], Hannah Ziobrowski[2], Annie Wentz[1], Alexis Lawrence[3], Francesca Beaudoin[3], Neha Reddy[3], Brandon D.L. Marshall[1], Michael Mello[3], Janette Baird[3], Elizabeth Samuels[3]*
[1]Brown University School of Public Health, [2]Harvard Medical School, [3]Alpert Medical School of Brown University
Abstract Detail Human

Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: For patients at risk for opioid overdose, emergency departments (EDs) may be an opportunity to access harm reduction services and addiction treatment. In 2014, we implemented a comprehensive overdose prevention program—including take-home naloxone, peer recovery coach consultation, and referral to treatment—for ED patients treated for an opioid overdose.
Methods: This retrospective, observational study utilized a RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework to evaluate adoption and maintenance of post-overdose services (2017—2020) at two Rhode Island emergency departments: an academic Level 1 trauma center and a community ED treating over 180,000 patients annually. We evaluated program reach (proportion receiving intervention), adoption (proportion providers delivering intervention), and maintenance (program reach per month). Logistic regression identified factors associated with receipt of each intervention and poisson regression to assess temporal trends in service provision, and Poisson regression modeled maintenance over time.
Results: In total, 783 patients had 1013 ED visits for an opioid overdose during the study period. Take-home naloxone was provided to the largest proportion of patients (67%; 524/783), treatment referral to 62% (482/783) and behavioral counseling to 50% (392/783). Provider adoption was high (>80%) for all offered services. There was no change in maintenance of utilization over time. After adjusting for patient, provider, and institutional level characteristics, factors associated with receipt or non-receipt of services included ethnicity, insurance status, day of ED visit, and composition of the treating clinical team.
Conclusions: This study demonstrated the long-term reach, adoption, and maintenance of ED-based harm reduction services for patients treated for an opioid overdose. Nearly all individuals received at least one of the three recommended interventions. Delivery of these interventions were impacted by clinical team composition, ethnicity, and day and month when patients are seen. Future research should focus on identifying successful implementation strategies to improve provision of harm reduction interventions, behavioral counseling, and treatment initiation.

W66. Familial Support in Initiation and Maintenance of Antiretroviral Therapy and Medications for Opioid Use Disorder in Vietnam

Patrick Brown[*1], Dinh Thanh Thuy[2], Andrew Edsall[1], Kim Hoffman[1], Hang Nguyen[1], Phuong Mai Pham[2], Gavin Bart[3], P. Todd Korthuis[1], Giang Le[2]*
[1]Oregon Health and Science University, [2]Hanoi Medical University, [3]University of Minnesota
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Background: Patients report that familial support can facilitate initiation and maintenance of antiretroviral therapy (ART) and medications for opioid use disorder (MOUD). However, providing such support can create pressure and additional burdens for families of people with opioid use disorder (OUD) and HIV. We aimed to examine familial support for people receiving treatment for OUD and HIV in Vietnam from the perspective of family members.
Methods: Methods: Between 2015 and 2018, we conducted face-to-face qualitative interviews with 44 family members (one per patient) across 4 HIV/OUD clinics in Hanoi, Vietnam. Participants were immediate family members (spouses or parents) of people living with HIV and OUD enrolled in the BRAVO study comparing HIV clinic-based buprenorphine with referral to methadone maintenance treatment. Interviews were professionally transcribed, coded in Vietnamese, and analyzed using a semantic, inductive approach to qualitative thematic analysis.
Results: Results: Family members reported supporting ART and MOUD initiation and maintenance through financial assistance, emotional support, and providing information regarding treatment for HIV and OUD. However, providing such support was emotionally burdensome for families, and taxing in terms of time and opportunity costs such as foregoing work or recreation to transport family members to appointments. Individual families' capacity for providing support could be overwhelmed, leading some to seek wider family circles to help share their financial and emotional burdens; however, this route was not available to all families.

Conclusions: Conclusions: Familial support for treatment with MOUD and ART among people with OUD and HIV in Vietnam takes a variety of tangible and intangible forms. Not all immediate families are able to provide the same level of support, and some may utilize the help of wider social networks. Characterizing familial support is important for understanding the experiences of people living with OUD and HIV specific to the context of Vietnam.

W67. Patient and Provider Experiences With Unsupervised Buprenorphine Initiation: Qualitative Research to Support Development of a Prescription Digital Therapeutic

Samantha Edington[1], Nicole Enman[1], Desire'e Dickerson[2], Andrea Duncan[2], Simone Royster[2], Carole Achtmeyer[3], Joseph Glass[4], Christopher Cannon[2], Colleen Lane[2], Hilary Luderer[1], Yuri Maricich[1], Bruce Imbert[5]*
[1]Pear Therapeutics, [2]Whitman-Walker Institute, [3]VA Puget Sound Health Care System, [4]Kaiser Permanente Washington Health Research Institute, [5]Tempero Bio

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Aim: Medications for opioid use disorder (MOUD) reduce risk of relapse and overdose, but disparities exist in access to and use of MOUD. Home-based (unsupervised) buprenorphine induction is considered safe and effective and may be a more equitable way to transition patients from illicit opioids to FDA-approved pharmacotherapy. However, negative experiences during induction are associated with failure to initiate or sustain MOUD treatment.
Prescription digital therapeutics (PDTs) provide FDA-authorized on-demand treatments for disease states. A PDT providing home-accessed support and education for patients during induction may improve adherence and reduce disparities in treatment outcomes. This research aims to understand potential pitfalls of buprenorphine induction to inform iterative development of a PDT for opioid use disorder (OUD).

Methods: Methods: One-on-one, semi-structured interviews were conducted with buprenorphine prescribers (n=6) and patients engaged in buprenorphine MOUD (n=5) regarding induction protocols, education, management of withdrawal symptoms, and unmet needs. Data were coded into categories and synthesized to identify themes.

Results: Results: Provider responses showed substantial variability in buprenorphine induction protocols and a lack of standardized patient education materials. Providers supported patients via frequent check-ins and follow-up visits for 3-7 days following the first buprenorphine dose. Common provider challenges included managing patients' expectations and anxiety about withdrawal symptoms. Patients reported generally positive experiences with induction, but they desired additional education and peer support to prepare them for the experience.

Conclusions: Conclusion: PDTs to support home-based buprenorphine induction could decrease treatment variability, provide standardized patient education and support about initiation and withdrawal symptoms, and could potentially reduce existing disparities in the use of buprenorphine MOUD and outcomes of treatment for patients with OUD.

W68. The Utility of Monetary Delay Discounting Tasks to Predict Risk for Acute Opioid Abuse Liability Response Among Individuals Who Are Opioid Naïve: Evidence From a Within Subject Laboratory Evaluation

Cecilia Bergeria[1], Justin Strickland[1], Matthew Johnson[1], Andrew Huhn[1], Denis Antoine[1], Kelly Dunn[1]*
[1]Johns Hopkins University School of Medicine

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research

Aim: Delay discounting characterizes how individuals devalue future consequences and is often greater in those with substance use history and poorer treatment response for substance use disorders (SUDs). This secondary analysis will determine if delay discounting can predict or characterize responses to acute opioid administration among individuals without a history of SUDs. If predictive of opioid response, such a measure could help identify individuals at risk for opioid use disorder.

Methods: Healthy adults (n=83) with no SUD history completed a five-day human laboratory study and received three doses of hydromorphone (2, 4, 8 mg), and placebo in a randomized, double-blind RCT. Subjective effects (Drug, Good, Bad, High and Energizing Effects), which assess abuse liability, were collected pre and post study drug administration at regular timepoints. Participants completed monetary delay discounting tasks prior to any study drug administration (baseline) and 1 hour after administration of each drug condition. A delay discounting parameter, which characterizes the extent to which monetary outcomes are devalued by delays, was computed from a choice procedure (i.e., 21-item monetary choice questionnaire) for each individual at baseline and for each condition.
Results: Linear mixed effect models determined that baseline delay discounting did not predict any peak subjective effects across dose conditions (delay discounting X dose, and delay discounting effects, p's > .05). However, exploratory post-hoc analyses determined that greater discounting of future rewards was predictive of greater scores on 'High' and "Energizing' effects following the administration of 4 mg, $p < .05$. Linear mixed effect models determined that delay discounting did not change as a function of dose and timepoint (baseline and post drug administration).
Conclusions: These data suggest that baseline discounting did not robustly predict risk for acute opioid abuse liability and that acute opioid administration does not impact delay discounting among individuals with no SUD history.

W69. Reduced Accumbal 5-HT2C Receptor Blunts Efficacy of Lorcaserin to Suppress Oxycodone Intake

Christina Merritt[*1], Sonja Stutz[1], Robert Fox[1], Noelle Anastasio[1], F. Gerard Moeller[2], Kathryn Cunningham[1]*
[1]University of Texas Medical Branch, [2]Virginia Commonwealth University
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Prescription opioid (e.g., oxycodone) misuse can evolve into opioid use disorder (OUD). Current FDA-approved treatment options for OUD are effective in suppressing opioid intake. However, individuals report severe adverse side effects, presenting a critical need for novel therapeutic options. The impetus to pursue and consume opioids involves key nodes within the mesocorticolimbic pathway including the nucleus accumbens (NAc) which expresses a rich population of the 5-HT2C receptor (5-HT2CR). We recently reported that systemic administration of the 5-HT2CR agonist lorcaserin suppresses oxycodone intake in rat self-administration (SA). Thus, we postulate that the NAc is a primary site of action for 5-HT2CR-mediated control of opioid intake and hypothesize that rats lacking accumbal 5-HT2CR will be resistant to the suppressive effects of 5-HT2CR agonist treatment during oxycodone SA.
Methods: A short hairpin RNA (shRNA) that efficiently knocks down 5-HT2CR in vivo was packaged into an adeno-associated viral (AAV) vector along with an AAV packaged with a non-silencing control (NSC) hairpin. Male Sprague-Dawley rats (n=12/group) received bilateral intra-NAc infusions of the 5-HT2CR-shRNA-eGFP-AAV or NSC-eGFP-AAV (AP: +1.4mm; ML: +3.0mm; DV: -7.8 mm; from Bregma). Rats recovered for 7d prior to oxycodone SA training (0.1 mg/kg/infusion). Upon meeting stability criteria, rats were challenged with the 5-HT2CR agonist lorcaserin and/or 5-HT2CR antagonist SB242084 prior to assessment of oxycodone intake.
Results: A mixed model ANOVA revealed a main effect of knockdown [$F_{1,22}=4.33$, $p<0.05$] and treatment [$F_{5,110}=6.423$, $p<0.05$], as well as a knockdown X treatment interaction [$F_{5,110}=2.262$, $p=0.05$]. Lorcaserin (1 mg/kg) suppressed oxycodone in rats with intact NAc 5-HT2CR ($p<0.05$), an effect reversed by SB242084. Treatment with lorcaserin or SB242084 failed to alter oxycodone SA in rats lacking accumbal 5-HT2CR.
Conclusions: The NAc 5-HT2CR is required for lorcaserin-induced suppression of oxycodone SA. This study provides mechanistic evidence for the 5-HT2CR as a viable therapeutic target for OUD treatment.

W70. Postoperative Opioid Misuse Predicts Prolonged Postoperative Pain, Opioid Use, and Delayed Recovery

Chinwe Nwaneshiudu[*1], Eric Cramer[1], Sean Mackey[1], Ian Carroll[1], Jennifer Hah[1]*
[1]Stanford University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids

Topic Other
Abstract Category Original Research
Aim: Opioid exposure during surgical recovery is associated with risks such as new persistent postoperative opioid use. With prolonged postoperative opioid use, little is also known about risks for developing opioid misuse. Currently, available measures of opioid misuse have not been validated among surgical patients, and the link between postoperative opioid misuse and postoperative pain, opioid use, and recovery after hospital discharge has not been examined.
Methods: A secondary analysis of the Stanford Accelerated Recovery Trial (START), a randomized, double-blinded trial was conducted at a single-center with 422 participants undergoing various surgeries between May 25, 2010, and July 25, 2014. 381 patients on post-operative opioids were identified. After discharge from surgery, surgical site pain, opioid medication use, and recovery were assessed with periodic phone calls. Calls occurred daily for the first 3 months, then weekly for 6 months, and finally monthly until patients reached pain cessation, opioid cessation, and full recovery up to 2 years, amounting to 19,511 distinct calls. Opioid misuse behavior was defined as any use of opioid medication for sleep or using more opioid than prescribed. Multivariate Cox proportional hazards regression was conducted for time to opioid cessation (5 consecutive days of no opioid use), pain cessation (5 consecutive days of 0 out of 10 pain on the NRS) and surgical recovery (a "yes" response to the question of complete surgical recovery).
Results: Postoperative opioid misuse was significantly associated with an increased time to pain resolution (hazard ratio [HR], 0.52; P < 0.001), delayed opioid cessation (HR, 0.44; P < 0.001) and prolonged surgical recovery (HR, 0.67; P <0.001).
Conclusions: These findings suggest the presence of postoperative opioid misuse is associated with worse postoperative outcomes including prolonged pain, opioid use, and delayed recovery. Future studies are needed to replicate these findings, and to validate postoperative opioid misuse assessments.

W71. Evidence Against the Involvement of Increased Dopamine Signalling in the Abuse Potential of Mu-Opioid Agonists

David Heal[*1], Sharon Smith*[1]
[1]*DevelRx Ltd*

Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Mechanisms of Action
Abstract Category Original Research
Aim: Based on microdialysis findings, Di Chiara & Imperato, (1988) proposed increased dopamine (DA) signalling in nucleus accumbens (ACB) as a common mediator for the reinforcing effect of substances of abuse. However, our microdialysis results and evidence from other sources argues against the involvement of CNS DA systems in discriminative and/or reinforcing actions of
mu-opioid agonists.
Methods: We implanted microdialysis probes (2mm) in ACB or ACB shell of anaesthetised male rats. After ≥16hr recovery, 15-20min samples (1.2-2.0µl/min artificial CSF) were taken from freely-moving rats for 3-4hr after administration of buprenorphine (0.1mg/kg, sc), cocaine (10mg/kg, ip), d-amphetamine (0.1-3mg/kg, ip). Results are mean %baseline DA±SEM, n = 5-11.
Results: ACB DA efflux was rapidly and markedly increased by cocaine (>3x at 20min; p<0.001) and d-amphetamine (≤15x at 20min; p<0.001); peak increases: cocaine (10mg/kg) = 363±80% (p<0.01) at 40min and d-amphetamine (3mg/kg) = 3393±399% at 40min (p<0.001). In contrast, buprenorphine took 45min to significantly increase DA efflux (<2x); peak increase = 262±70% (p<0.001) at 195min.
Conclusions: The stimulants produced large, rapid increases of DA signalling. These actions mediate their discriminative stimuli (Croft & Stratman, 1996; Yan et al, 2006) and reinforcing effects (Ettenberg et al, 1982; Higgins et al, 1994). The small, delayed increase of DA efflux produced by buprenorphine is similar to other mu-opioid agonists (Di Chiara & Imperato, 1988; Barrot et al, 1999). The pharmacodynamics of DA efflux are too small and too delayed to be involved in the mu-opioid agonists' discriminative or reinforcing effects. This conclusion is consistent with the lack of effect of dopamine antagonists on the discriminative and reinforcing effects of mu-opioid agonists (Corrigal & Coen, 1990; Suzuki et al, 1995; Cook & Beardsley, 2004; Ettenberg et al, 1982; Higgins et al, 1994).

W72. COVID-19-Related Barriers to Recovery Among African Americans With Opioid Use Disorder

Devin Banks[1], Andrea Fentem[2], Xiao Li[2], Erin Kasson[2], Raven Riordan[2], Rachel Winograd[1], Patricia Cavazos[2]*
[1]*University of Missouri--St. Louis,* [2]*Washington University School of Medicine*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: The COVID-19 pandemic has exacerbated opioid overdose deaths particularly among African Americans who face disproportionate physical and financial impacts of COVID-19. The current study aimed to describe the impact of COVID-19-related strain among African Americans engaged in recovery for opioid use disorder (OUD) to illuminate ongoing recovery needs among this population.
Methods: Participants were adults with OUD receiving addiction recovery services in Missouri clinics during the COVID-19 pandemic. Although this study is ongoing, 36 African American participants (61% male) have so far completed baseline measures of COVID-19-related strain.
Results: Participants reported concerns about the impact of COVID-19 on their recovery efforts. Specifically, 37% of participants reported COVID-19 and associated restrictions had greatly to moderately impacted their recovery, with 20% indicating little-to-no recovery support from their clinic during the pandemic. Among those that received recovery support, 15% reported the quality of their recovery treatment had declined since the pandemic began. Qualitative descriptions further demonstrated these concerns. One individual reported, "[The pandemic] has made it hard to see my doctor and get my script." Another stated, "Everything stopped—all treatment activities. I started isolating even worse once COVID started."
Regarding COVID-19-related strain, 60% of participants reported increased depressed mood and 40% reported increased anxiety since the pandemic began. Those who reported increased depressed mood reported significantly greater cravings to use opioids (Mean = 11.38, SD = 8.40) than those who did not (Mean = 5.53, SD = 6.06, p = 0.03).
Conclusions: Findings suggest that African Americans with OUD have experienced decreased treatment access and recovery support during the pandemic. Results are concerning as African Americans faced inequitable treatment access before the pandemic. Recovery efforts should assess, monitor, and implement strategies to address negative mood and other COVID-19-related strain among African Americans who continue to bear the financial, psychological, and physical brunt of the pandemic.

W73. Medication Development of Ibogaine for Use in Opioid Withdrawal Management

Deborah Mash[1], Michael Karukin[2], Matthias Luz[2]*
[1]*University of Miami Miller School of Medicine,* [2]*DemeRx Inc.*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Alternative Medicine
Abstract Category Theoretical/Commentary

Aim: Ibogaine has been used in clinics offering medically supported substance withdrawal in countries where the drug is not regulated. Ibogaine was approved by the FDA for Phase I testing under an investigator IND in 1993 but never advanced beyond the initial part of the IND-opening study. Clinical development of ibogaine has been hindered by concerns for safety despite open-label effectiveness.
Methods (Optional): We conducted a retrospective review of all published and proprietary information on the clinical use of ibogaine. Oral dosages used in humans were between 8 and 25 mg/kg. Clinical data are primarily based on a case series of male and female patients (N=277) who received ibogaine treatment in an independent clinic and on peer-reviewed clinical studies and case reports. Additional safety and pharmacokinetic data were taken from information amendments (IND 39,680).
Results (Optional): Single dose ibogaine (8 to 12 mg/kg) was well tolerated in patients, with nausea, vomiting and transient ataxia as the most common side effects (Mash et al., 2018). Oral doses up to 2 mg/kg were without SAEs or clinical signs of neurotoxicity (IND 39,680). No histopathological evidence of cerebellar neurotoxicity was found in the brain of a 34-year-old woman who died from 1 2021 CPDD Annual Scientific Meeting natural causes (4 separate doses ~20 mg/kg over a 15-month period; IND 39,680). Oral administration of ibogaine over 14

days in rats was not associated with histopathological findings (150 mg/kg/d; human equivalent dose: 24.2 mg/kg/d) suggesting that ibogaine will have low risk of cerebellar toxicity in humans.
Conclusions: Our retrospective review of the available preclinical and clinical evidence provides support for the clinical development of ibogaine for the treatment of acute opioid withdrawal symptoms and to facilitate abrupt discontinuation of the use of opioids. Ibogaine has the potential to be a safe, effective and transformative therapy for patients seeking to break their intractable cycle of opioid dependence.

W74. Substance Use, Sleep Parameters - Adults With Opioid Dependence

Richa Tripathi[1], Ravindra Rao[2], Anju Dhawan[1], Raka Jain[1]*
[1]All India Institute of Medical Sciences, [2]National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, New Delhi
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Opioid dependent individuals frequently complain of sleep problems in withdrawal and during abstinence. The objectives were to assess substance use and sleep parameters (subjective and objective) among young and old adult buprenorphine-maintained opioid-dependent patients.
Methods: Using a cross-sectional study design, 106 hundred six opioid-dependent male patients maintained on buprenorphine for at least six months and on same dose in past month with no other psychotropic medications were interviewed. Subjective sleep was assessed by Pittsburgh sleep quality index (PSQI). 28 patients underwent objective sleep study.
Results: 62 participants were in younger group (< 45 years) and 44 participants were of older (> 45 years) group. There was significant difference in age of onset of substances between the two groups with older age having later age of onset for tobacco, alcohol, cannabis and opioids. The younger group had more injecting users (inject pentazocine and buprenorphine) and were less compliant for OST (p value-0.02). The older group had more sleep latency, less total sleep time and more mean PSQI score but the difference was insignificant. There was also no significant difference in participants with PSQI>5 between the two groups. For objective sleep study 16 patients were in younger age group and 12 were of older age group. Upon comparing objective sleep parameters there was significant difference in N2 sleep latency, REM sleep latency and REM sleep between the two groups with younger group having more sleep latency and more REM sleep.
Conclusions: Opioid dependent patients on buprenorphine have sleep problems but these problems not necessarily increase with advancing age

W75. Evaluation of a Program to Provide Medications to Treat Opioid Use Disorder (MOUD) in Jail and After Community Re-Entry: Client Characteristics, MOUD Utilization, and Outcomes Two Years After Implementation

Elizabeth Delorme[1], Calla Harrington[1], Liz Evans[1]*
[1]University of Massachusetts Amherst
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: The Franklin County Sheriff's Office (FCSO), in Greenfield, Massachusetts, is among the first jails nationwide to provide correctional populations with access to all three medications to treat opioid use disorder (MOUD, i.e., buprenorphine, methadone, naltrexone) during incarceration and after community re-entry. In 2018 FCSO was funded to assist with implementing MOUD programming in nearby Hampshire County jail. The University of Massachusetts is conducting an independent evaluation of the MOUD program. Analysis of the first two years of data provides information on the flow and characteristics of program participants, rates of MOUD utilization, and effects on health and social status.
Methods: We examined MOUD utilization and treatment outcomes among 304 program participants from two jails in Western Massachusetts. Data were collected at jail intake and discharge, and at 3 months after jail exit.
Results: Participants were mostly male (83.5%) and White (71.2%), 34 years old on average, and high school educated. While in jail, 46.9% of participants received buprenorphine, followed by methadone (18.5%), and

naltrexone (4.4%); 30.3% did not receive MOUD. At 3 months after jail exit, 67.1% of participants self-reported use of MOUD; of these, 56.9% were receiving buprenorphine, 25.5% methadone, and 17.7% naltrexone. Primary reasons for not receiving MOUD after jail exit were due to gaps in knowledge about MOUD, fear of social stigma or discrimination, health care delivery system barriers, and active substance use. As for other outcomes, 82.9% were opioid abstinent at follow-up, there were high rates of mental health symptoms (84.2%) and homelessness (68.5%), and 2.6% had died.
Conclusions: Expanded access to MOUD in jail settings can engage an at-risk population with needed treatment. In future analyses, we will examine predictors of post-release MOUD utilization and related outcomes.

W76. Baseline and Early Non-Opioid Substance Use in Opioid Use Disorder Treatment: Results From a Harmonized Data Set of Three Clinical Trials

Felipe Castillo[*1], Mei-Chen Hu[2], Ying Liu[2], Roger Weiss[3], John Rotrosen[4], Edward Nunes[1], Andrew Saxon[5], Daniel Feaster[6], Sean Luo[2]*
[1]Columbia University and New York State Psychiatric Institute, [2]Columbia University, [3]McLean Hospital, [4]NYU Langone School of Medicine, [5]Veterans Affairs Puget Sound Healthcare System, [6]University of Miami Miller School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Patients undergoing medication treatment for opioid use disorder (MOUD) often report non-opioid drug use prior to initiating treatment. Few studies exist that examine the relationship between early or baseline non-opioid use and subsequent treatment outcome.
Methods: We combined and harmonized three large, randomized clinical trials from the National Drug Abuse Treatment Clinical Trials Network (CTN0027, CTN0030, and CTN0051, N=2,197) which compared different treatment settings and MOUDs in individuals with opioid use disorder. CTN0027 and CTN0030 were outpatient studies, while CTN0027 compared buprenorphine with methadone, CTN0030 used buprenorphine only, and CTN0051 compared buprenorphine and extended-release naltrexone (XR-NTX) initiated inpatient. Using logistic regression, we tested the correlation of baseline and first-month substance use with a return to opioid use or relapse at 12 weeks. For this study, we defined relapse as four consecutive positive or missing urine drug screens or 7 consecutive days of self-reported use.
Results: Inpatient groups had higher baseline use of all non-opioid substances. However, when treatment group and settings were adjusted, we did not detect an association between baseline non-opioid drug use and relapse at 12-weeks. Higher use of cocaine (OR 4.34, P<1E-4), amphetamine (OR 1.57, P=0.001), and non-prescribed methadone (OR 2.41, P = 0.007) in the first month of MOUD treatment were associated with a higher likelihood of relapse at 12 weeks in all treatment groups. Exploratory analyses of potential treatment by moderator interaction showed that participants with heavier baseline cocaine use had less relapse in the XR-NTX group and more in the methadone group, and the inpatient setting did not have lower relapse rates for individuals with higher first-month alcohol and amphetamine use.
Conclusions: Baseline patterns of non-opioid drug use likely do not preferentially indicate a choice for MOUD or treatment setting. However, treatment by moderator interactions suggest increased risk of relapse for certain drug use and treatment combinations.

W77. IND-Enabling Toxicology Studies of a Vaccine to Treat Opioid Use Disorders and Prevent Opioid Overdoses

Fatima Hamid[*1], Cheryl Marker[1], Michael Raleigh[2], Aaron Khaimraj[1], Scott Winston[3], Paul Pentel[4], Sandra Comer[5], Marco Pravetoni[1]*
[1]University of Minnesota Medical School, [2]University of Minnesota, [3]Winston Biopharmaceutical Consulting, [4]Hennepin County Medical Center, [5]Columbia University and NYSPI
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research

Aim: Opioid use disorders (OUD) represent a public health threat which results in over 100,000 fatal overdoses annually worldwide. Vaccines offer a promising strategy to treat OUD and prevent opioid overdoses. A candidate vaccine targeting oxycodone (Oxy-sKLH vaccine) has shown pre-clinical efficacy in generating highly specific antibodies that block oxycodone distribution to the brain without interfering with other OUD treatments or analgesics. The Oxy-sKLH vaccine is currently undergoing evaluation in Phase I clinical trials. To support regulatory approval and clinical development, a Good Laboratory Practice (GLP) toxicology study was conducted to test the safety of Oxy-sKLH.
Methods: Sprague Dawley rats (55/sex) were vaccinated with either aluminum adjuvant or Oxy-sKLH adsorbed on aluminum. Low and high doses of Oxy-sKLH were administered every two weeks for a total of four vaccinations. Vaccine-related adverse effects and toxicity were assessed pre- and post-mortem. Additionally, rats immunized with control or active vaccines were challenged with daily subcutaneous oxycodone injections for 7 days to assess whether concurrent exposure to oxycodone in vaccinated animals resulted in adverse events. Upon completion of the oxycodone exposure protocols, rats were euthanized immediately or allowed a four-week recovery period prior to post-mortem analyses. Statistical analyses included ANOVA with Dunnett's post-hoc test and t-test as appropriate.
Results: This GLP study found no adverse or toxic effects related to immunization with Oxy-sKLH alone or with concurrent oxycodone administration. No significant vaccine-related findings were observed during any in-life observations or in the clinical and anatomical pathology assessments.
Conclusions: These results demonstrate that the Oxy-sKLH vaccine is well-tolerated and does not produce undesired side effects in rats. These data supported approval by the Food and Drug Administration to start the first in-human clinical trials of a vaccine against oxycodone.

W78. Mobile Technology With Integrated Incentives to Promote Buprenorphine Treatment Enrollment and Adherence

Forrest Toegel[1], Matthew D. Novak[1], Kenneth Silverman[1], August Holtyn[1]*
[1]Johns Hopkins University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Buprenorphine is an FDA-approved medication for opioid use disorder that can reduce opioid use and overdose, but many individuals who could benefit from buprenorphine treatment do not enter treatment. The present research developed and tested a novel intervention that combines video-based directly observed therapy and the remote delivery of financial incentives to connect out-of-treatment adults with opioid use disorders to buprenorphine treatment and promote adherence to buprenorphine.
Methods: Participants (N=41, n=30 male and n=11 female) received referrals to buprenorphine treatment and were randomly assigned to Incentive or Control groups for a 6-month study period. Participants in both groups completed monthly assessments in which they reported their treatment status and provided urine samples that were tested for opioids. Participants in the Incentive group earned financial incentives ($70) for enrolling in buprenorphine treatment and providing documentation that they received a buprenorphine prescription. Then they could earn additional incentives for using a smartphone application to record and submit regular videos of adherence to their buprenorphine regimen ($10 per video). Participants in the Control group could not earn financial incentives.
Results: Logistic regression showed that Incentive participants were significantly more likely to enroll in treatment compared to Control participants (71% versus 30% of participants; OR=6.24, 95% CI=1.46-26.72, p=.014). Few participants adhered to buprenorphine treatment, and the two groups did not differ in the percentage of urine tests that were positive for buprenorphine, opiates, fentanyl, or methadone at monthly assessments conducted during the intervention period.
Conclusions: The remote delivery of financial incentives can connect out-of-treatment adults with opioid use disorder to treatment, but additional supports may be needed to promote adherence to buprenorphine treatment.

W79. Open Board

W80. Modeling Targeted Interventions to Reduce Opioid-Related Overdose in Recently Released Criminal Justice Involved Individuals

Harold Pollack[1], Eric Tatara[2], John Schneider[3], Madeline Quasebarth[3], Nicholson Collier[2], Basmattee Boodram[4], Samuel Friedman[5], Elizabeth Salisbury-Afshar[6], Mary Ellen Mackesy-Amiti[4], Jonathan Ozik[2]*
[1]University of Chicago School of Social Service Administration, [2]Argonne National Laboratories, [3]University of Chicago, [4]University of Illinois at Chicago, [5]NYU Medical School, [6]University of Wisconsin at Madison

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research

Aim: Criminal justice involved (CJI) individuals with histories of opioid use disorder (OUD) face high risks of overdose and death in the weeks following release. Single-use naloxone has been shown to reduce the risk of death from overdoes by up to 95% when used effectively. Our aim is to investigate the effectiveness of providing naloxone to individuals released from jail in combination with other interventions to reduce the risk of overdose and death through modeling studies of a population in metropolitan Chicago. We further focus on scenarios of mass jail release events and reduction in incarceration rates and arrests that result in a smaller jail population and the implications for OUD interventions that occur before, during and after jail.
Methods: We developed the Justice- Community Circulation Model (JCCM) to investigate OUD/CJI dynamics post-release and the effects of interventions on overdose deaths. The JCCM uses a synthetic agent-based model population of 150,000 unique persons in Chicago. The data was curated from multiple Chicago-area studies and data sets, including the Cook County Medical Examiner's Office, the Chicago Public Health Department, and the Cook County Jail System. Then, under diverse scenarios involving mass release of individuals from the Cook County Jail System, we modeled the effect of combinations of interventions using criteria for reducing overdoses, deaths, and costs of interventions.
Results: Our agent-based model analysis predicts that jail-based prevention intervention will significantly reduce monthly opioid overdose deaths--particularly in an environment of low naloxone availability within the general population.
Conclusions: The work highlights the importance of focused interventions on the CJI population with history of OUD. We also demonstrate the value of agent-based modeling in evaluating the potential effects of complex, combined interventions in settings where access, logistics, or costs may be prohibitive for clinical trials.

W81. COVID-19 Methadone Take-Home Policies Did Not Increase Positive Opioid Urine Screens in Two Opioid Treatment Programs

Kim Hoffman[1], Chantell Smith-Graves[2], Ryan Cook[1], Gregory Brigham[2], Ximena Levander[1], John McIlveen[3], Dennis McCarty[1], Javier Ponce Terashima[4], P. Todd Korthuis[1]*
[1]Oregon Health & Science University, [2]Adapt, [3]Oregon Health Authority, [4]University Hospitals Cleveland Medical Center

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: In March 2020, the Substance Abuse and Mental Health Services Administration permitted increased access to take-home opioid agonist medication and promoted telehealth for psychosocial services to minimize patient and staff exposure to COVID-19 in opioid treatment programs (OTPs). A mixed-methods study assessed how these policy changes were received and their association with return to drug use in two rural Oregon opioid treatment programs (OTPs).
Methods: Patient electronic health records were analyzed to determine if opioid positive urine rates differed before and after the policy change among patients receiving methadone. In-depth, semi-structured qualitative interviews with OTP patients and staff supplemented quantitative data and explored experiences and reactions to increases in take-home dosing vs. daily clinic dosing.
Results: Study participants (n = 371) had a mean age of 39 years, 49% women, 87% Caucasian, and 10% American Indian. Patients averaged just under one UDT per month between January and June 2020. Opioid positive drug screen rates were stable prior to and following the March changes: January (21%), February (21%), April (21%), May (22%), and June (19%). The rate ratio for positive opioid UDT in April – June vs. January –

February was 0.98 (95% CI 0.90 to 1.05, p = 0.54). Qualitative interviews suggested that patients (n=16) and staff (n=4) found increased methadone take-homes effective and acceptable without return to use. Most patients switched to more take-homes welcomed the change and expressed a sense of pride in being given the responsibility. However, staff expressed worry at not seeing patients as frequently.
Conclusions: The relaxation of take-home restrictions and implementation of tele-health in response to COVID-19 did not change opioid UDT rates among OTP patients in our study. Qualitative reports of continued recovery in the context of fewer restrictions suggest that permanently amending federal regulations to permit more use of take-homes might be safe.

W82. Diagnostic Accuracy of the BDI-II and its Relationship to Direct-Acting Antivirals Adherence: Implications for Hepatitis C Treatment Among People Who Inject Drugs on Medications for Opioid Use Disorder

Irene Pericot-Valverde[1], Moonseong Heo[1], Jiajing Niu[1], Brandon Caudill[2], Brianna Norton[3], Matthew Akiyama[3], Linda Agyemang[3], Alain Litwin[1]*
[1]Clemson University, [2]University of South Carolina School of Medicine, [3]Albert Einstein College of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Depression is overrepresented among people who inject drugs (PWID) and those infected with hepatitis C virus (HCV). Among PWID, depression has been associated with increased risk of opioid and other illicit drug use, overdose, and other risky drug-related behaviors. When treating HCV with early interferon-based regimens, depressive symptoms were exacerbated and associated with treatment failure among PWID. The effects of new direct-acting antiviral (DAA) medications on depressive symptoms have not yet been analyzed in clinical trials. This study aimed at examining the diagnostic accuracy of the BDI-II as a screening tool for major depressive disorder (MDD) among HCV-infected PWID on medications for opioid use disorder (MOUD), and (2) exploring the association between DAA adherence and both MDD diagnosis and depressive symptoms.
Methods: Participants were 150 HCV-infected PWID on MOUD who were enrolled in a randomized clinical trial evaluating the effectiveness of three models of HCV care. Depressive symptoms were assessed using the Beck Depression Inventory-II (BDI-II) at baseline and every 4 weeks during treatment. The Mini-International Neuropsychiatric Interview (MINI) was utilized to assess current MDD at baseline. Adherence was measured continuously during treatment (weeks 1 to 12) using electronic blisterpacks
Results: Twenty and 61 participants presented risk of MDD based on the MINI and BDI-II, respectively. A score ≥18 was identified as the optimal cutoff to detect MDD. A negative association between BDI scores at baseline and adherence rates at treatment weeks 1 to 3 (p=.022) was found, evidencing that higher BDI-II scores were associated with lower adherence rates. No relationship was found between BDI-II scores during treatment adherence as well as between MDD diagnosis and adherence.
Conclusions: Utilizing a cutoff score specific for HCV-infected PWID would allow us to accurately identify individuals with depression. Neither depressive symptoms nor MDD diagnosis should be used as justification to withhold treatment for HCV among PWID

W83. Nonfatal Overdose and Neurodegeneration Among Women With History of Opioid Use

Janna Ataiants[1], Michael Voronkov[2], Benjamin Cocchiaro[3], Stephen Lankenau[1]*
[1]Drexel University Dornsife School of Public Health, [2]Signum Biosciences, [3]Penn State Hershey College of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Other
Abstract Category Original Research
Aim: Little is known about neurodegeneration as a consequence of nonfatal opioid overdose. Women may be particularly vulnerable as their rates of nonfatal overdose are comparable to those of men, yet female sex is a risk factor for neurodegeneration. We examined the relationship between nonfatal overdose and neurodegeneration among women with lifetime opioid use.

Methods: In 2016-2017, 188 female participants of harm reduction services with history of opioid use were recruited and surveyed in Philadelphia. Five indicators of neurodegeneration experienced in the past 12 months were assessed: abnormal changes in memory, slight shakiness in the hand, slurred speech, difficulty concentrating, and difficulty planning ahead. A composite score for neurodegeneration was computed ranging 0-5. Logistic regression estimated an association of frequency of nonfatal overdoses with individual neurodegeneration items. Negative binomial regressions assessed direct and reverse associations between the rates of nonfatal overdoses and neurodegeneration composite score. All models were adjusted for age and lifetime head injury.
Results: The majority of women (68.6%) were White, with the mean age (SD) of 37.6 (9.8). The median (IQR) for nonfatal overdose was 2 (0-4) and 38.8% experienced head injury. Two-thirds (67%) reported at least one neurodegeneration symptom and the median (IQR) for neurodegeneration composite score was 1 (0-3). Lifetime frequency of nonfatal overdoses correlated with each individual neurodegeneration symptom. One-unit increase in overdose frequency predicted 4% higher neurodegeneration score per one year of age (IRR 1.04; 95% CI 1.01 - 1.10). One-unit increase in the neurodegeneration score was associated with 22% increase in frequency of nonfatal overdoses per one year of age (IRR 1.22; 95% CI 1.08-1.36).
Conclusions: Findings suggest that nonfatal overdose may be both a risk factor and consequence of neurodegeneration among women with lifetime opioid use. Prospective research needs to establish the directionality and confounding factors of this relationship.

W84. Short-Term Outcomes Following a Pilot Study of the HOPE Smartphone Application to Support Medication-Assisted Treatment for Opioid Use Disorder

Jacqueline Hodges[*1], Marika Waselewski[2], Jacqueline Huynh[1], Kori Otero[1], Taylor Franklin[1], William Harrington[1], Karen Ingersoll[1], Nassima Ait-Daoud Tiouririne[1], Tabor Flickinger[1], Rebecca Dillingham[1]*
[1]University of Virginia School of Medicine, [2]University of Michigan Medical School

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Conduct a pilot study to test a smartphone app intervention called HOPE developed to support medication-assisted treatment (MAT) for opioid use disorder.
Methods: Patients were recruited from a MAT program at the University of Virginia to participate in a pilot study approved by the Institutional Review Board. HOPE's features include self-monitoring daily check-ins assessing medication adherence, substance use, mood and stress, secure provider messaging, and an anonymous community message board. Data was collected upon enrollment and six months post-enrollment. Six-month outcomes of interest included usage of bidirectional app features and retention in MAT. Patient scoring on six surveys were compared between the first and sixth month (paired t-test) for: patient self-control and self-efficacy, mental health and perceived stress, social support, perceived provider empathy, and perceived stigma of substance use.
Results: A total of 25 patients and 3 MAT providers were enrolled. Patient participant engagement by functionality was assessed. Patient participant usage of provider messaging was highest. In month one, all participants messaged providers, and at 6 months, 19 continued to message. Twenty-two participants tried the daily check-in feature in the first month, but only 13 continued to register daily check-ins at 6 months. Similarly, 9 patient participants used the community message board in the first month, but only one used it in month 6. Retention in MAT at 6 months was 56% (14/25 patients). Mean patient scoring improved for all surveys between timepoints (N=16 available), with significant differences observed for the brief self-control scale (38 to 44, max score 65, p=0.02) and drug abstinence self-efficacy scale (3.2 to 3.8, max score 5, p=0.02).
Conclusions: Participants demonstrated uptake of multiple app features over 6 months. Six-month retention was comparable to observed rates for MAT without mHealth interventions. Patient scoring of overall self-control and drug abstinence self-efficacy improved following participation in the intervention.

W85. Open Board

W86. Modeling the Long-Term Impact of Buprenorphine-Naloxone Treatment at Syringe Service Programs on Statewide Overdoses and Treatment Engagement

Joella Adams[*1], Alexandra Savinkina[2], Aaron Fox[3], Czarina Behrends[4], Avik Chatterjee[5], Alexander Walley[5], Joshua Barocas[2], Benjamin Linas[5]*

[1]Brown University, [2]Boston Medical Center, [3]Montefiore Medical Center and Albert Einstein College of Medicine, [4]Weill Cornell Medical College, [5]Boston University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Harm Reduction
Abstract Category Original Research
Aim: Despite serving large numbers of individuals with opioid use disorder (OUD), only 11% of syringe service programs (SSPs) in North America provide on-site medications for opioid use disorder (MOUD). We used a mathematical model to estimate population-level overdose and treatment outcomes associated with offering buprenorphine treatment on-site within all Massachusetts SSPs.
Methods: We employed a state-transition cohort-based mathematical model simulating the natural history of OUD to estimate statewide treatment initiations, treatment engagement, and the number of averted overdoses over a ten-year period (2020-2030). We compared an intervention scenario where 30% of SSP clients initiated on-site buprenorphine treatment at least once annually to a status quo scenario where no MOUD were available onsite. We derived model inputs from state and national surveillance data, clinical trials, and observational studies. We assumed that 80% of SSP clients had recently injected drugs and that treatment within SSPs would have similar or improved retention compared to community-based buprenorphine programs, but higher rates of active opioid use while in treatment.
Results: The status quo scenario resulted in 23,051 fatal overdoses and 1,511,613 treatment initiations (i.e., individuals began treatment on an MOUD or entered detoxification) over a ten-year simulation period. Approximately 13% of the statewide population with OUD was actively in treatment with an MOUD by the end of 2030. An intervention scenario with on-site SSP buprenorphine treatment averted 5,015 (-21.8%) fatal overdoses and resulted in 117,576 (+7.8%) additional treatment initiations compared to the status quo. By the end of the 10 years, 23% of the statewide population with OUD was actively in treatment with an MOUD.
Conclusions: Offering buprenorphine treatment at SSPs has the potential to significantly decrease fatal overdoses and improve treatment engagement statewide. Additional information regarding uptake of treatment services and retention within low-threshold treatment programs is needed to fully characterize impact.

W87. Clinical Impact, Costs, and Cost-Effectiveness of Opioid Agonist Medications and Addiction Care for Hospitalized Patients With OUD

Joshua Barocas[1], Alexandra Savinkina[1], Joella Adams[1], Raagini Jawa[1], Zoe Weinstein[1], Jeffrey Samet[2], Benjamin Linas[2]*
[1]Boston Medical Center, [2]Boston University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: The syndemic of injection drug use and serious injection-related infections (SIRI) is leading to increasing mortality. Although outpatient treatment with medications for opioid use disorder (MOUD) reduces overdose risk and recurrent SIRI, hospitalization remains common. We evaluated the clinical impact, costs, and cost-effectiveness of hospital-based strategies to address the opioid epidemic.
Methods: We used a microsimulation model to compare the cost-effectiveness of: 1) standard hospital care-detoxification for opioids, no addiction consult service (status quo); 2) expanded inpatient MOUD prescribing (MOUD alone); 3) implementation of addiction consult services (ACS alone); and 4) combined MOUD with ACS strategy (combined). We used clinical trials and observational cohorts to inform model inputs, including demographics; injection behaviors; infection, overdose, and hospitalization risk; and outpatient MOUD uptake. Outcomes included life years (LY), discounted costs, incremental cost-effectiveness ratios (ICERs), hospitalizations, and deaths. Costs ($US) were discounted at 3% annually and ICERs (willingness to pay threshold=$100,000/LY). We performed probabilistic sensitivity analyses (PSA) to address uncertainty.
Results: The status quo resulted in 32.98 LY at a cost of $754,400/person. Life expectancy was extended by each strategy: 0.013y with MOUD alone, 0.032y with ACS alone, and 0.038y with combined. Compared to status quo, MOUD alone had an ICER of $10,100/LY and combined of $17,100/LY; ACS alone was dominated (provided fewer benefits for money spent). The status quo resulted in 2,598 hospitalizations/10,000 individuals whereas competing strategies resulted in fewer hospitalizations: 13 fewer in MOUD alone, 19 fewer in ACS alone, and 21

fewer in combined. All scenarios decreased mortality from overdose and SIRIs, with the greatest decrease in combined strategy (16 fewer deaths/10,000). Findings were robust in scenario analysis and PSA.
Conclusions: Expanding hospital-based MOUD prescribing and implementing ACS together improves life expectancy, is cost-effective, and should be the basis for a comprehensive hospital-based strategy for addressing the opioid epidemic.

W88. Mortality of Buprenorphine and Methadone in the United States 2010-2017

Joshua Black[*1], Gabrielle Bau[1], Janetta Iwanicki[1], Richard Dart[1]*
[1]Rocky Mountain Poison & Drug Safety
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: During an ever-growing opioid overdose crisis, buprenorphine is increasingly dispensed as a treatment for opioid use disorder. Like all opioids, however, buprenorphine has the potential for misuse and abuse. The objective of this study was to provide public health surveillance of buprenorphine overdose mortality. The study is part of a Risk Evaluation and Mitigation Strategy for SUBOXONE sublingual film, authorized generic of SUBOXONE film, SUBOXONE tablets, and SUBUTEX tablets.
Methods: Drug mentions on death certificates from 2010 to 2017 were analyzed from the Drug Involved Mortality database to identify buprenorphine-involved and methadone-involved deaths. Deaths identified as poisonings were included. Mortality rates adjusted by population and dispensing were calculated. Dosage units dispensed data were obtained from IQVIA™; these data are estimates of retail dispensing of buprenorphine.
Results: Decedents with buprenorphine listed on their death certificate (n=3,241) were younger and slightly more likely to be white than methadone (n=31,659). The buprenorphine-involved mortality rate increased from 0.006 deaths per 100,000 population in 2010 to 0.068 in 2017. Methadone-involved mortality rates decreased from 0.371 to 0.266 over the same period. When adjusted by dispensing, the buprenorphine-involved mortality rate has risen three-fold from 0.066 cases per 100,000 dosage-units dispensed in 2011 to 0.225 cases in 2017. This indicates the number of cases is rising proportionally faster than the number of dosage units dispensed. The proportion of polysubstance involvement among buprenorphine-involved deaths rose from 76.7% in 2010 to 93.8% in 2017. Benzodiazepines were the most frequent drug substance found with buprenorphine.
Conclusions: Maintenance therapy is a critical tool to combating the opioid crisis, and polysubstance use further complicates treatment. Increasing buprenorphine mortality disproportionate to dispensing is concerning as the need for maintenance therapy is rising. Given the high proportion of polysubstance buprenorphine-involved deaths in 2017, there is substantial need to communicate the risks of polysubstance use to patients.

W89. Treatment Outcomes for Medications for Opioid Use Disorder for Criminal Justice Referred Clients in Residential Treatment: A National Study

Jerry Stahler[*1], Jeremy Mennis[1], Steven Belenko[1], Heidi Grunwald[1], Damaris Rohsenow[2], Lynda Stein[3], Lauren Brinkley-Rubinstein[4], Rosemarie Martin[2]*
[1]Temple University, [2]Brown University School of Public Health, [3]University of Rhode Island, [4]University of North Carolina
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: To examine the influence of medications for opioid use disorder (MOUD) on short-term (ST) (30 days or less) and long-term (LT) (>30 days) residential treatment completion and retention for CJ-referred (CJR) clients. Research questions include: are CJR client treatment outcomes different from non-CJR clients; are CJR clients less likely to receive MOUD; is MOUD associated with increased likelihood of better outcomes for CJR clients and does MOUD moderate outcomes differently for CJR vs. non-CJR clients?
Methods: Admissions/discharge data with opioid use as the primary substance were extracted from the 2015-2017 TEDS-D datasets for residential treatment settings (n=144,658). Primary outcome variables were treatment completion and retention. Chi-square and logistic regression were used to examine differences in outcomes

between CJR clients (n=34,464) vs non-CJR clients and to estimate the effect of MOUD on treatment outcomes for ST and LT residential settings separately.
Results: CJR clients had higher rates of treatment completion and retention vs. non-CJR clients for both ST and LT residential settings but were less likely to receive MOUD (ST: OR=.536***; LT: OR=.385***). For CJR clients, MOUD was not associated with any difference in the likelihood of treatment retention (ST: OR=1.016, LT: OR=.971) or treatment completion in ST settings (OR=1.072) but was associated with a reduced likelihood of treatment completion in LT settings (OR=0.631***). Moderation analysis found MOUD was associated with less positive outcomes for CJR vs. non-CJR clients for both treatment completion (ST: OR=.809***; LT: OR=.860**) and retention (ST: OR=.734***; LT: OR=.754***).
Conclusions: CJ-referred clients had a greater likelihood of treatment completion and retention than non-CJR clients overall, but MOUD was not associated with improved outcomes for CJR clients. It is possible that unaccounted for contextual factors may interfere with the positive effects of MOUD for CJR clients, or that MOUD is a marker for CJR clients at highest risk for poor outcomes.

W90. Exploratory Study of Heart Rate Variability Among Opioid Use Disordered Participants Undergoing Buprenorphine-Assisted Detoxification

Jackson Weaver[1], Michael Mancino[1], Merideth Addicott[1], Jeff Thostenson[1], Linda Larson-Prior[1], Alison Oliveto[1]*
[1]University of Arkansas for Medical Sciences
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Given opioid detoxification has high relapse rates and lack of efficacy in relieving subjective symptoms, we assessed Heart Rate Variability (HRV) during an ongoing double blind, placebo-controlled, trial of gabapentin during a buprenorphine (BUP)-assisted taper in order to explore the relevance of relative autonomic imbalance at several key time points.
Methods: 20 prescription opioid use disordered individuals aged 22-40 (15 M, 5F) participating in an ongoing double blind, placebo-controlled, trial of adjunct gabapentin (GBP) during a BUP-assisted taper underwent a brief session during week 1 (day 2 BUP induction), week 2 (end of GBN/placebo induction) and week 3 (end of BUP taper), during which heart rate variability (HRV) measures were assessed for 2 min each while standing, sitting and sitting while performing paced breathing. HRV measures were obtained using the ProComp2 System with sensor belt and analysis suite (Biograph Infiniti). HRV metrics, including low frequency (LF) power, high frequency (HF) power, LF/HF ratio, heart rate (HR), respirations, stand deviation of the IBI (inter-beat intervals) of normal sinus beats (SDNN), and coherence ratio, were analyzed using Spearman correlation to determine correlations with craving, mood and distress tolerance measures completed at each time point.
Results: Recruitment is ongoing. Thus far 20 participants have undergone at least one session. Preliminary correlation analyses revealed several findings at the end of the BUP taper (timepoint 3); i.e., State Trait Anxiety Inventory state scores and craving episodes duration were negatively correlated with coherence ratio (r= -1.00, $p<0.0001$) and standing SDNN (r= -0.97, p=0.0048), respectively; while craving intensity and Anxiety Severity Index scores were positively correlated with paced breathing HR (r= 0.99, p= 0.003) and paced breathing respirations (1.00, $p<0.001$), respectively.
Conclusions: These preliminary findings suggest that at the end of a BUP taper, anxiety and craving measures may be associated with HRV measures.

W91. Contributions of a Methadone Central Registry to Support Opioid Treatment Programs and State Partners Through the Healing Communities Study

Katherine Marks[1], Jeffery Talbert[2], Michelle Lofwall[3], Laura Fanucchi[3], Holly Broce[4], Sharon Walsh[1]*
[1]University of Kentucky, [2]University of Kentucky, College of Pharmacy, [3]University of Kentucky, College of Medicine, [4]Pinnacle Treatment Centers
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: A methadone central registry was established in Kentucky (KY) as part of the HEALing (Helping End Addiction Long-Term) Communities Study (HCS) to monitor study outcomes related to methadone treatment enrollment and retention - an evidence-based practice in the Opioid-overdose Reduction Continuum of Care Approach. The aim of this retrospective, longitudinal study was to compare and contrast the functionality of the central registry with Medicaid claims. A secondary aim was to describe the community-engaged process and regulatory factors involved in establishing a methadone central registry.
Methods: Methadone central registry data included individuals enrolled in Kentucky Opioid Treatment Programs (OTP) with residence in an HCS-KY community. Kentucky Medicaid data included enrollees with an Opioid Use Disorder diagnosis, residence in an HCS-KY county, and a claim for methadone. Primary outcome measures included the number of individuals receiving methadone and retained beyond 6-months in 2020.
Results: The methadone central registry included 4,568 unique individuals enrolled in methadone treatment with 3,489 retained beyond 6-months. Registry data were complete within 72-hours of the 2020 year-end. Replacing a fax-based system, registry data also enabled non-dual-enrollment verification, guest dosing, patient transfers, and auto-generated monitoring reports. In contrast, Medicaid claims included 2,033 unique individuals with 327 retained beyond 6-months. Medicaid data were complete only for January through March at 2020 year-end.
Conclusions: A methadone central registry provides a complete and daily record of all individuals receiving methadone through Kentucky-based OTPs and exceeds the functionality of Medicaid claims. In addition, the registry meets the converging need of providers, regulatory authorities, and researchers to monitor dual enrollment, provider compliance, and treatment outcomes. Engagement with key stakeholders, including OTPs, the State Opioid Treatment Authority, and HCS faculty, was necessary to establish a central registry and facilitate implementation.

W92. Infectious Disease Outcomes Among Persons With Opioid Use Disorder Treated With Buprenorphine, Methadone or Extended-Release Naltrexone: A Systematic Review and Meta-Analysis

Katelyn McNamara[*1], Breanne E. Biondi[2], Raúl U. Hernández-Ramírez[3], Noor Taweh[4], Alyssa A. Grimshaw[5], Sandra A. Springer[6]*
[1]Loyola University Chicago Stritch School of Medicine, [2]Boston University School of Public Health, [3]Center for Interdisciplinary Research on AIDS and Yale School of Public Health, [4]University of Connecticut, [5]Yale University, [6]Yale University School of Medicine

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Literature Review

Aim: The opioid epidemic is a public health crisis leading to loss of life directly from overdose, as well as from associated infectious diseases (ID). Three FDA-approved medications for opioid use disorder (OUD; MOUD) are the most effective treatment for OUD: methadone, buprenorphine, and extended-release naltrexone. MOUD has reduced overdose mortality and has been shown to improve some ID outcomes. This systematic review and meta-analysis sought to determine the impact of MOUD on 4 prevalent OUD-associated IDs and their treatment outcomes: HIV, Hepatitis C (HCV), Hepatitis B (HBV), and endocarditis.
Methods (Optional): The eligibility criteria included peer-reviewed published manuscripts evaluating one of the ID outcomes of interest in adults with OUD receiving MOUD that included a comparison group of persons with OUD not on MOUD. Outcomes of interest were antiretroviral therapy (ART) adherence, HIV viral suppression (VS), HCV sustained virologic response (SVR), HCV re-infection, new HBV infections, and endocarditis-antimicrobial treatment completion, readmission, and surgical outcomes.
Results (Optional): A comprehensive search yielded 8,169 papers; 11 were included in the final review (5 assessed HIV VS, 2 evaluated ART adherence, 1 evaluated HCV SVR, and 3 evaluated endocarditis-related outcomes). No eligible papers were found for other outcomes. Unadjusted results suggested a positive association between being on MOUD and HCV SVR. No evidence of an association between MOUD and endocarditis-related outcomes was found. The meta-analysis revealed that being on MOUD was associated with greater ART adherence (Odds Ratio 1.55; 95% Confidence Interval 1.12-2.15) and having HIV VS (2.19; 1.88-2.56).
Conclusions: There is significant support for integrating MOUD with HIV treatment to improve VS among persons living with HIV (PLH) and OUD. Treatment of OUD among PLH should be a priority in order to help

reach the global goals of ending the intertwined opioid and HIV epidemics. Future research should evaluate the impact of MOUD on HCV re-infection after cure and endocarditis treatment outcomes.

W93. Examining the Benefit of RBP-6000 300mg Versus 100mg Maintenance Dose in Opioid Injectors

Katharina Wiest[*1], Mark Greenwald[2], Susan Learned[3], Anne Le Moigne[3], Yue Zhao[3]*
[1]Oregon Health & Sciences University, [2]Wayne State University, [3]Indivior, Inc.

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: RBP-6000 (SUBLOCADE®) is a once-monthly, extended-release depot formulation of buprenorphine for treating moderate to severe opioid use disorder (OUD). We conducted post-hoc analyses from the pivotal Phase III study (NCT02357901)[1] to compare efficacy and safety of SUBLOCADE® 300mg versus 100mg maintenance doses in participants who used opioids via injection route.

Methods: Adults with moderate or severe OUD were randomized to SUBLOCADE® 300/100mg, 300/300mg (2 initial monthly injections of 300mg followed by 4 monthly maintenance doses of 100mg or 300mg), or placebo for 24 weeks. Opioid abstinence assessment was based on weekly opioid-negative urine samples and negative self-reports. Each participant's percentages of abstinence after first, second, and third maintenance injections of 300mg or 100mg were compared separately for injectors and non-injector subgroups. Inverse propensity weighting using propensity scores was used to balance pre-maintenance dose risk factors that might impact response to the maintenance doses. Numbers of participants reporting treatment-emergent adverse events (TEAEs) were summarized separately for the periods during the first and second 300mg injections (initiation) and maintenance dosing.

Results: Analyses included 130 opioid-injecting and 183 non-injecting participants at screening. Injection users' percentage abstinence during the 300mg maintenance dose improved and separated from the 100mg dose after each new maintenance injection: risk-adjusted differences (95% CI) were 13.0% (-1.6, 27.6), 16.5% (1.6, 31.4), and 18.7% (3.9, 33.4) after first, second, and third maintenance doses, respectively. Incidence of TEAEs among injectors was generally lower or comparable for the 300/300mg vs 300/100mg dosing regimens during initiation and maintenance dose periods (46% vs 63% and 60% vs 67% for 300/300mg and 300/100mg, respectively).

Conclusions: These analyses suggest treatment of injecting opioid users with SUBLOCADE® 300mg maintenance dose may improve efficacy with a comparable safety profile. This added benefit is clinically relevant in this high-risk, difficult-to-treat population.

1.SUBLOCADE United States Prescribing Information, February 2020. https://www.accessdata.fda.gov/drugsatfda_docs/label/2010/022410s000lbl.pdf Accessed October 30, 2020.

W94. Factors Associated With COVID-19 Vaccination Among Patients in Addiction Treatment

Lawrence Brown[*1], Vinodini Kumaravelu[1], Alvin Chu[1], Anthony McLeod[1], Darren Zhang[1]*
[1]START Treatment & Recovery Centers

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: To assess the factors associated with receptivity to covid-19 vaccination among a ethnical diverse population of 2800 patients receiving treatment for opiate use disorder

Methods: A short survey consisting of demographic information and questions regarding various factors important in COVID-19 vaccine decision-making is administered to around 2850 patients in seven opioid treatment program clinics. The data was analyzed using SPSS (version 26).

Results: The preliminary demographics of our patient population consists of predominantly Black/ African American (29%), Hispanic (39%), White (12%) and Males (70%). Age and length of stay in treatment were associated with greater receptivity.

Conclusions: Successful vaccination programs for disadvantaged patient populations will require tailoring to the unique aspects and beliefs of patients, especially those at risk for acquiring covid-19 infection and for greater

covid-19 morbidity and mortality. The benefits will not only be to this patient population but also to their families and their communities.

W95. A Pilot Evaluating Usability and Patient Perceptions of a Patient Decision Aid for Medications for Opioid Use Disorder

Lynn Madden[*1], Dharushana Muthulingham[2], Thomas Hassett[3], Nick Reid[4], Monica Guo[5], Frederick Altice[6]*
[1]APT Foundation, [2]Washington University, [3]Yale University, [4]University of Washington School of Medicine, [5]None, [6]Yale School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Medications for opioid use disorder (MOUD) reduce overdose mortality and HIV/HCV transmission. Inaccurate perceptions about treatment contribute to suboptimal uptake. Evidence-informed decision aids (DA) improve knowledge and treatment engagement. We developed a DA to guide patients on whether to start MOUD and which MOUD is best.
Hypothesis: Alpha testing of an internet-based decision aid for MOUD will guide refinement.
Methods: The DA prototype involved input from topical experts, clinical providers and patients along with focus groups and conjoint analyses of patient preferences using the SUNDAE checklist. The DA was delivered using a tablet while a researcher observed, conducted an interview and administered a survey to evaluate participant impressions and experience.
Results: Alpha testing was done with 5 participants (mean=35 years); 4 men, 3 whites, and 4 previously incarcerated. Length (N=4), understandability (N=5), balanced information (N=5) and accuracy aligned with their experiences (N=3) were high. Other benefits included its interactivity, organization, and explanations of both risks and benefits of treatment options. All agreed it would be helpful for patients entering treatment. Observed weaknesses were that the DA could be easier to use and lacked information about polysubstance use. Observations of patients showed a lack of engagement with tabular data. Patient treatment preferences about treatment didn't change after DA use.
Conclusions: A DA for patients with OUD that supports medication selection is a critical tool to increase patient engagement. Our DA met standardized criteria and was favorably evaluated by patients. We plan to revise include more information about OUD, and iteratively re-evaluate with larger sample sizes.

W96. Patient Characteristics and Retention Among Homeless Patients Enrolled in a Low-Barrier-To Treatment-Entry Medication for Opioid Use Disorder Program

Marina Gaeta[*1], Iain Carmichael[2], Lynn M. Madden[3], Mark Beitel[3], Kathryn Eggert[4], Declan T. Barry[3]*
[1]Yale University School of Medicine, [2]University of Washington Department of Statistics, [3]Yale University School of Medicine & The APT Foundation, [4]The APT Foundation
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Disparities
Abstract Category Original Research
Aim: To investigate baseline patient characteristics and one-year retention among patients reporting homelessness at treatment entry at a low-barrier-to-treatment-access medication for opioid use disorder (MOUD) program.
Methods: We performed retrospective record review of consecutive patients enrolled from April-October 2017 at a not-for-profit, low-barrier-to-treatment-access MOUD program involving methadone or buprenorphine. Patients completed measures of demographics, psychological distress, trauma, smoking, and pain. Associations between housing status and correlates were investigated with chi-squared and Mann-Whitney U tests as appropriate while controlling the False Discovery Rate with the Benjamini-Hochberg procedure. A mixed graphical model was fit to examine associations among all correlates. A two-sample logrank test for interval censored data examined the relationship between retention and housing status. This association was further scrutinized by regressing retention on all covariates using a Cox proportional hazards model for interval censored data.
Results: Forty-six patients were unhoused and 442 were domiciled. Thirty-seven percent of patients self-identified as female and 20% as non-White. Patients experiencing homelessness had lower social support and recent

employment; higher levels of psychological distress; and higher rates of physical and sexual assault, recent marijuana use, and current chronic pain (all p's<0.01). There was a statistically significant association between retention and housing status (p=0.006) that remained significant after regressing on all covariates (Hazard Ratio =1.69 for homelessness, CI=1.14-2.50).
Conclusions: Unhoused patients entering MOUD have multiple potential vulnerabilities. Homelessness is an independent risk factor for decreased 12-month retention in MOUD. Systematically identifying and addressing the vulnerabilities associated with homelessness at MOUD treatment entry may be important in promoting MOUD retention as well as quality of life.

W97. The Relationship Between Resilience and the Five-Factor Model of Personality in a Sample of Individuals With Opioid Use Disorder

Suky Martinez[*1], Laura Brandt[1], Albert Garcia-Romeu[2], Freymon Perez[1], Sandra Comer[1], Jermaine Jones[1]*
[1]Columbia University & New York State Psychiatric Institute, [2]Johns Hopkins University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Neurobiology/Neuroscience
Abstract Category Original Research
Aim: Resilience is a psychobiological trait related to the development of adverse psychiatric symptomology in response to stress and trauma. The present pilot study aimed to delineate the underlying personality facets that may contribute to trait resilience. Specifically, we investigated the relationship between trait resilience and a five-factor model of personality among individuals with opioid use disorder (OUD).
Methods: The current data were obtained from individuals with OUD who participated in an ongoing investigation examining the effects of heroin use on epigenetic aging among individuals of African ancestry. Participants met DSM-5 criteria for OUD, but other severe psychiatric disorders were exclusionary. Participants completed several measures to assess their current and history of drug use, along with trait resilience [Connor-Davidson-Resilience-Scale-25 (CD-RISC-25)] and the five-factor model of personality [Revised-NEO-Personality-Inventory (NEO PI-R)]. A two-step cluster analysis was performed to identify groups with distinct profiles within the NEO's five-factor model of personality and trait resilience. Linear regression was used to examine the association between trait resilience and the NEO's five-factors.
Results: Seventy-one participants (16.7% female, mean age 48.6 years) were included in the current analysis. Their mean duration of opioid use was 18.3 (±10.5), and mean CD-RISC-25 score was 67.9 (±14.3). A two-cluster classification emerged from the cluster analysis [Cluster 1 CD-RISC-25 M=58.6 (SD=11.2); Cluster 2 CD-RISC-25 M=76.1 (SD=11.9)], with a robust silhouette coefficient of 0.5. The "High Resilience Cluster" (Cluster 2) was characterized by higher: Extraversion, Openness, Agreeableness, and Conscientiousness, and lower Neuroticism compared to "Low Resilience Cluster." The NEO's five-factor model explained ~56% of the variance in resilience score, $F(5,62)=15.7$, $p < .001$.
Conclusions: These findings suggest the five factors of personality have a strong association with trait resilience among individuals with OUD. Future studies should explore the relationship between these psychological phenotypes, drug use behaviors, and treatment outcomes.

W98. Anti-Fentanyl Vaccines and Monoclonal Antibodies are Effective in Prevention and Reversal of Fentanyl-Induced Toxicity and Overdose in Rats

Mariah Wu[1], Carly Baehr[*1], Dustin Hicks[1], Fatima Hamid[1], Diego Luengas[1], Marco Pravetoni[1]*
[1]University of Minnesota
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Pharmacology
Abstract Category Original Research
Aim: The incidence of drug overdose deaths in the United States is an alarming public health threat that has accelerated during the COVID-19 pandemic, with over 80,000 deaths recorded in 2020. A substantial portion of this increase is attributable to the widespread access of illicit fentanyl and other synthetic opioids, either used alone or as adulterants in street mixtures of heroin, cocaine, or methamphetamine. Vaccines and monoclonal antibodies (mAb) offer prophylactic and therapeutic interventions against opioid overdose by binding and

sequestering the target opioids in serum and reducing opioid distribution to the brain. Here, anti-fentanyl vaccines and mAb were tested for their efficacy in prevention and reversal of fentanyl-induced overdose in rats.
Methods: Rats (n=9/group) were immunized with either a candidate vaccine consisting of a fentanyl-based hapten (F) conjugated to a diphtheria toxin carrier protein (CRM), or control vaccine. Rats were challenged subcutaneously with repeated doses of 0.25 mg/kg fentanyl every 15 minutes to a cumulative dose of 2.25 mg/kg, or until cardiac or respiratory arrest occurred. A second study tested whether a lead anti-fentanyl mAb would reverse the effects of fentanyl post-exposure. Fifteen minutes after exposure to 0.1-0.5 mg/kg fentanyl, rats (n=3/group) were treated intravenously with 40 mg/kg mAb, 0.1 mg/kg naloxone, or both.
Results: Prophylactic immunization with F-CRM was effective in counteracting fentanyl-induced respiratory depression ($p<0.01$), bradycardia ($p<0.05$), antinociception ($p<0.05$), and reduced the incidence of mortality compared to control ($p<0.0001$). Treatment with mAb reduced fentanyl-induced respiratory depression and bradycardia ($p<0.05$), and protection was comparable to naloxone. A week later, rats retained mAb-induced protection against additional doses of fentanyl as confirmed by a 10-fold ($p<0.01$) reduction of the distribution of fentanyl to the brain compared to control.
Conclusions: These results support translation of vaccines and mAb as medical interventions to prevent and reverse opioid overdose related to fentanyl and its analogs.

W99. Preclinical Approaches to Assess Respiratory Safety of Drugs in Combination With an Opioid

Nathan Appel[1], Jane Acri[1]*
[1]*National Institute of Drug Abuse, National Institutes of Health*
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Drug Interactions
Abstract Category Original Research
Aim: The current opioid crisis reinforces the need for better medications to treat opioid use disorder and overdose. The emergent toxicity of opioid overdose is respiratory depression resulting in asphyxiation, because the user stops breathing, leading to cardiac arrest. Hence, one demand in developing a medication for opioid users is establishing safety in the presence of an opioid; the intended treatment drug cannot exacerbate respiratory depressant effect of opioids because the treatment medication may be an "add-on" to methadone or buprenorphine or patients may use an illicit opioid (e.g., heroin) while in treatment. To that end FDA requires both animal and human interaction studies for new chemical entities being evaluated as potential substance abuse therapeutics. Thus, NIDA endeavored to develop sensitive quantitative preclinical approaches to detect if a drug may exacerbate opioid respiratory depressant effects.
Methods: We used EMMS whole-body plethysmographs to measure effects on breathing and Abbott i-STAT blood analyzers to measure PaO2 and PaCO2, and tested combinations of oral diazepam (0, 20 and 200 mg/kg) and intravenous morphine (0, 2.5 and 10 mg/kg) in unrestrained, freely-moving rats in order to develop appropriate protocols. Morphine doses were administered at the Tmax of plasma diazepam.
Results: Both diazepam dose levels decreased respiratory rate, tidal volume and minute volume. High-dose morphine decreased respiratory rate, tidal volume and minute volume. Both diazepam dose-levels further increased depressant effects of subsequent high-dose morphine. PaO2 and PaCO2 tracked respiratory effects: hypoxia and hypercapnia were manifest where ventilation was decreased.
Conclusions: These studies, conducted in order to develop a standard protocol, demonstrate that measuring respiratory parameters using whole body plethysmography or arterial blood gas partial pressures using a portable hand-held device are viable and convenient approaches for assessing adverse respiratory interactions between a potential medication and an opioid.

W100. Exploratory Study of Potential Novel Biomarkers for Identifying Opioid Use Patterns in Humans: Implications for Predicting Clinical Efficacy of Anti-Opioid Vaccines for Treating Opioid Use Disorders and Preventing Opioid Overdose

Marco Pravetoni[1], April Huseby Kelcher[1], Laura Brandt[2], Gianna Triller[3], Tatum Holt[1], Nina Papavasiliou[3], Sandra Comer[2]*
[1]*University of Minnesota Medical School,* [2]*Columbia University Irving Medical Center and New York State Psychiatric Institute,* [3]*German Cancer Research Center (DKFZ),*

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Anti-opioid vaccines induce antibodies that selectively bind target opioids, thus preventing drug distribution to the brain, and reducing opioid-induced pharmacological effects. While vaccines offer a promising strategy to treat opioid use disorders (OUD), their efficacy may be limited to subsets of immunized subjects achieving optimal antibody responses against opioids. Seeking to identifying biomarkers predictive of vaccine efficacy against opioids, our pre-clinical studies showed that higher pre-vaccination frequency of opioid-specific B cell lymphocytes correlates with greater vaccine efficacy against opioids. To explore the potential use of opioid-specific B cells as clinical biomarkers, this study tested whether the frequency of opioid-specific B cells is elevated in opioid users versus non-opioid users. We hypothesize that if higher frequency of opioid-specific B cells correlates with opioid usage in this population, B cell-based biomarkers may predict clinical vaccine efficacy.
Methods: Opioid-specific B cells and antibodies were analyzed in blood from opioid-naïve participants and participants who had used opioids daily for the past 12 months (self-report confirmed by urine drug screen; male and female subjects; n= 22-25 per group).
Results: Antigen-based magnetic enrichment paired with flow cytometry detected increased frequencies of oxycodone-specific B cells in the opioid-using group compared to controls. The combined frequency of oxycodone- and morphine-specific B cells was greater than oxycodone-specific B cells alone. Overall, the frequency of oxycodone-specific B cells was associated with selected patterns of drug use. Single-cell sorting paired with B cell receptor sequencing showed a similar frequency of identical antibody binding variable regions in both groups. Negligible levels of oxycodone-specific antibodies were found in both groups.
Conclusions: Opioid-specific B cell frequency may be a sensitive measure of opioid use. Ongoing Phase I clinical trials of anti-opioid vaccines will test whether specific B cell repertoires can serve as biomarkers of vaccine efficacy against OUD.

W101. Methamphetamine Use and Opioid-Related Overdose: A Qualitative Study of Lay Knowledge, Attitudes, and Behaviors

Raminta Daniulaityte[1], Sydney Silverstein[2], Kylie Getz[2]*
[1]*Arizona State University,* [2]*Wright State University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research
Aim: Methamphetamine use has increased substantially among individuals with opioid use disorder. Prior research indicates that methamphetamine use among individuals who also use illicit opioids is linked to an increased risk of an unintentional overdose. The key aims of this study are to detail and contextualize lay knowledge, attitudes, and behaviors related to methamphetamine use and opioid overdose risks.
Methods: Using respondent-driven sampling, the study recruited 42 individuals in the Dayton, Ohio, area who reported current (past 30 days) use of both methamphetamine and heroin/fentanyl. Interviews included structured and open-ended qualitative questions. Interviews were audio-recorded. Open-ended interview sections were transcribed and analyzed qualitatively using NVivo. The study was approved by the University IRB.
Results: Out of 42 individuals, about half were female, and nearly all were non-Hispanic whites. The mean age was around 39 years. The majority had long histories of illicit opioid use, marked with transitions from non-prescribed pharmaceutical opioids to heroin and more recently to non-pharmaceutical fentanyl. Most individuals reported relatively recent involvement with methamphetamine when “dirt cheap” “ice” suddenly flooded the region already devasted by the opioid overdose epidemic. Nearly all participants had intimate personal experiences of opioid-related overdoses. Many were convinced that methamphetamine can be used to aid in preventing and/or reversing an opioid-related overdose. These beliefs were grounded in the ideas of “lay pharmacology” and influenced by the ambiguities surrounding lay notions of an opioid overdose. They were often acted upon in the highly chaotic “last resort” situations (e.g., when Narcan was not accessible), and within the context of exceedingly unpredictable local drug market that had become saturated with the fentanyl-type drugs.

Conclusions: The study contributes to a better understanding of lay attitudes and practices regarding the potential perceived benefits of methamphetamine use among some individuals who use heroin/fentanyl. The findings will help inform prevention and interventions approaches.

W102. Initiating Monthly Buprenorphine Injection After Single Dose of Sublingual Buprenorphine

Katharina Wiest[1], Robert Dobbins[2], Stephanie Strafford[2], Sunita Shinde[2], Amy Heath[2], Howard Hassman[3]*
[1]Oregon Health & Sciences University, [2]Indivior Inc., [3]Hassman Research Institute LLC

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research

Aim: Buprenorphine extended-release injection (Sublocade) is indicated for treatment of moderate/severe opioid use disorder (OUD) in patients who have initiated treatment with transmucosal buprenorphine, followed by dose adjustment for a minimum of 7 days.1 To meet clinical needs in this COVID 19 era,2,3 we evaluated safety and tolerability of initiating BUP-XR following a single dose of 4 mg Suboxone.

Methods: Eligible participants abstained from short-acting opioids for 6h and long-acting opioids for 24h. Qualitative and quantitative urine drug screens, self-reported drug use, and the clinical opiate withdrawal scale (COWS) were completed before buprenorphine administration. If COWS score was ≥8, staff administered 4 mg Suboxone. If the participant did not exhibit hypersensitivity, symptoms of precipitated withdrawal (PW), or sedation within 1h, 300 mg of Sublocade was administered and clinical assessments were completed for 28 days. Rescue medications and supplemental Suboxone were permitted to treat withdrawal. Endpoints were: 1) COWS score increase of ≥6 and 2) independent physician adjudication of PW.

Results: 26 participants received Suboxone, 24 proceeded to Sublocade injection, and 20 completed the study. After Sublocade injection, mean±SD COWS scores decreased from a pre-Sublocade baseline of 12.6±4.1 to 6.9±4.1 at 6h and to 4.2±3.2 at 24h. Most participants (62.5%) experienced their maximum COWS score pre-injection. Two participants experienced a COWS score increase of ≥6 from the pre-injection value (events occurred at 1h and 2h post-injection). By independent adjudication, 2/24 participants experienced PW. No participants experienced severe withdrawal and one participant experienced moderately severe withdrawal (maximum COWS score=27 at 2h post-injection). Irritability, anxiety, nausea, and pain were the most common adverse events (AEs). There were no serious AEs or AEs requiring Sublocade discontinuation.

Conclusions: Initiating Sublocade 300 mg following a single 4 mg dose of Suboxone demonstrated a safety profile similar to that observed with Sublocade induction per current labelling.1

W103. Safety and Tolerability of Intranasal Oxytocin in Older Women

Jillian Rung[1], Erin Tammi[1], Marilyn Horta[1], David Feifel[2], Meredith Berry[1], Natalie Ebner[1]*
[1]University of Florida, [2]University of California, San Diego

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Prevention
Abstract Category Original Research

Aim: Oxytocin decreases typical drug-related effects across multiple drug classes, which has produced interest in its potential as a pharmacotherapy for substance use disorders. The present aims were to evaluate the safety and tolerability of daily intranasal oxytocin administration in women.

Methods: Older women (N = 48) were randomized to self-administer intranasal oxytocin or placebo for four weeks. Pre- and post-intervention, participants provided cardiovascular safety measures (heart rate, blood pressure), and blood and urine samples for assessing metabolic biomarkers and osmolality, respectively. Symptoms were assessed weekly for the first three weeks of the intervention, and one week after. Oxytocin/Placebo differences in cardiovascular and biomarker-derived safety measures from pre to post-intervention were evaluated using linear mixed models; and group differences in symptoms will be evaluated using negative binomial mixed models.

Results: Preliminary results (n = 43) show that the only significant effect of Oxytocin on safety measures was on blood pressure, which significantly increased (mean change of 3.61 and 5.62 mmHg, respectively; ps < .04). The number of weekly symptoms reported was low in both groups (Mdn OT = 1, P = 1), and a majority of participants

reported at least one symptom throughout the study (Oxytocin = 76%, P = 72%). All participants that withdrew during the intervention (n = 5) were in the Placebo group.
Conclusions: Thus far, chronic intranasal Oxytocin appears to be generally safe and well-tolerated in older adult women; data coding and analysis are ongoing. However, Oxytocin administration did increase blood pressure to a small degree, indicating it may not be suitable for older women with high or uncontrolled blood pressure. Should ongoing research support abuse-liability mitigating effects of Oxytocin in humans, Oxytocin may be a safe adjunct to co-prescribe with some substances (e.g., opioids) to reduce the likelihood of developing (or serve as adjunct treatment for) a use disorder.

W104. An Evaluation of Factors Associated With Retention on Medication Treatment for Opioid Use Disorder Among a Cohort of Persons Seeking Treatment in the Community

Breanne Biondi[1], Brent Vande Wyk[2], Albert Shaw[2], Sandra Springer[2]*
[1]Boston University School of Public Health, [2]Yale University School of Medicine
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Medication treatment for opioid use disorder (OUD) (MOUD; buprenorphine and methadone) reduces opioid craving, opioid use, and overdose. Discontinuation of MOUD can quickly lead to relapse, overdose and death. Few persons who initiate MOUD are retained on MOUD, thus it is critical to identify factors associated with retention on MOUD.
Methods: Data were gathered from an ongoing NIH-funded prospective cohort study of persons with OUD, living with and without HIV. All were seeking buprenorphine or methadone treatment in the community and were followed for 6 months. Participants were considered retained on MOUD through 6 months if they reported taking MOUD at every study interview without discontinuation. Participants who changed the type of MOUD were considered retained if they did not discontinue medication before changing medication. A high dose of MOUD was defined as a methadone dose >85mg or buprenorphine dose ≥16mg. Multivariable logistic regression analyses were undertaken to assess factors associated with 6-month MOUD retention, adjusting for age, gender, MOUD type, and baseline opioid use severity.
Results: 118 participants (73% male, 58% white, 36% with HIV) were included. Buprenorphine was initiated by 58% and 42% started methadone. 53% were retained on MOUD at 6-months. In adjusted models, a high dose of MOUD (OR=4.71, 95%CI 2.05-10.84) and higher pain interference (OR=1.59, 95%CI 1.15-2.19) was associated with MOUD retention. Homelessness was associated with lower odds of retention (OR=0.44, 95%CI 0.20-1.00)
Conclusions: Our results demonstrate that adequate dosing of MOUD leads to improved retention on MOUD, while lack of housing reduces retention. Further, persons with high pain interference at baseline had higher odds of retention on MOUD. Both methadone and buprenorphine have analgesic effects, thus those with high pain interference could have dual benefits of MOUD for treating OUD and pain

W105. The Early Impact of COVID-19 on Medication Treatment for Opioid Use Disorder Service Delivery in Rural Primary Care Settings

Stacy Calhoun[1], Allison Ober[2], Alex R. Dopp[2], Sarah Clingan[1], ChunQin Lin[1], Megan Black[1], Megan E. Curtis[1], Sherry Larkins[1], Teresa Mata Cervantes[1], Melissa Salgado[1], Maria Hanano[1], Laura-Mae Baldwin[3], Katie P. Osterhage[3], Emily Hichborn[4], Laurie S. Lester[4], Bethany McLeman[4], Lisa Marsch[4], Larissa Mooney[1], Yih-Ing Hser[1]*
[1]University of California, Los Angeles, [2]RAND Corporation, [3]University of Washington, [4]Dartmouth College
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research
Aim: In response to the coronavirus (COVID-19) pandemic, healthcare settings throughout the United States have made substantial changes to their service operations. This qualitative study explores the early impact COVID-19 had on the delivery of medication treatment for opioid use disorder (MOUD) in rural primary care clinics.
Methods: As part of a larger study (Clinical Trials Network (CTN)-0102 Rural MOUD), we conducted virtual interviews and focus groups with administrators (N=7), providers (PCPs, behavioral health, N=32) and other clinic

staff (medical assistants, registered nurses, N= 42) from 11 rural primary care clinics providing MOUD services across five states (California, Idaho, Maine, Oregon, Washington). Content analysis was conducted to identify themes relevant to the impact of COVID-19 on MOUD services at the participating clinics.
Results: Preliminary analysis of transcripts revealed a substantial increase in telemedicine services at most of the clinics during the first months of the pandemic. By fall 2020, most services had transitioned back to mostly in-person care. Several prominent themes specific to the shift to delivering MOUD through video conferencing or telephone during the early months of the pandemic included: 1) internet connectivity and other technological challenges for patients limited the use of video platforms; 2) reduced urine drug screens and behavioral treatment groups raised provider concerns about comprehensive care and monitoring; and 3) increased engagement/accountability issues (e.g., not scheduling or missing appointments required by the program), particularly among patients in the early stabilization phase of their treatment.
Conclusions: The shift towards telemedicine early in the pandemic raised clinical challenges related to technology barriers, provision of comprehensive care and monitoring, and treatment engagement. Although, telemedicine provides opportunity to engage OUD patients in continued treatment and care during a pandemic, specific challenges need to be addressed prior to implementing this method when usual in-person care options for MOUD are interrupted.

W106. Physiological Effects of Cyclopropylfentanyl, as Compared to Fentanyl and Heroin, in Rats

Shelby McGriff[*1], Eric Thorndike[1], Michael Baumann[1], Charles Schindler[1]*
[1]NIDA Intramural Research Program
Abstract Detail Animal Study
Select Drug Category Opiates/Opioids
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: There is a wide gap in knowledge about the pharmacology of novel synthetic opioids (NSOs), especially fentanyl analogs found in recreational drug markets. The aim of this study was to characterize the physiological effects of the NSO, cyclopropylfentanyl, as compared to the effects of fentanyl and heroin.
Methods: Six male Long-Evans rats received surgically implanted telemetry transmitters for the measurement of blood pressure (BP), heart rate (HR), locomotor activity, and body temperature. Rats in their home cages were placed onto telemetry receivers for 3 h each weekday, with s.c. drug or vehicle injections administered on Tuesdays and Fridays.
Results: Fentanyl and cyclopropylfentanyl (0.01-0.1 mg/kg) significantly increased BP and HR ($p<0.01$), while decreasing locomotor activity at the highest dose. Cyclopropylfentanyl displayed slightly higher potency than fentanyl. Cyclopropylfentanyl increased temperature at some doses, but fentanyl did not. Heroin (0.03-0.3 mg/kg) significantly increased BP, HR, activity, and temperature ($p<0.01$), but did not decrease locomotor activity at the highest dose. A single injection of the mu-opioid antagonist, naltrexone (0.3 mg/kg), blocked the effects of fentanyl (0.1 mg/kg). By contrast, the peripherally restricted opioid antagonist, naloxone methiodide (2 mg/kg), failed to block the HR and BP effects of fentanyl, while enhancing activity and temperature ($p<0.05$).
Conclusions: Fentanyl and cyclopropylfentanyl showed significant cardiovascular effects at lower doses than heroin. The high potency of cyclopropylfentanyl reveals potential risks to users who are unknowingly exposed to this drug and highlights the need for further investigation into the pharmacology of fentanyl analogs found in recreational drug markets.

W107. Safety and Efficacy of Rapid Methadone Titration for Opioid Use Disorder in An Inpatient Setting: A Retrospective Cohort Study

Sukhpreet Klaire[*1], Nadia Fairbairn[1], Andrea Ryan[2], Seonaid Nolan[1], Mark McLean[2], Paxton Bach[1]*
[1]British Columbia Centre on Substance Use, [2]University of British Colombia
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Methadone is a well-studied and effective treatment for opioid use disorder (OUD). To ensure tolerance and safety, recommended starting doses are significantly lower than the therapeutic dose range. This leads to a lengthy

titration period that may be associated with ongoing illicit substance use, risk of overdose, and high attrition rates. The inpatient setting offers additional resources that can potentially be utilized in order to titrate patients more rapidly. To date, such a strategy has never been formally evaluated.
Methods: Retrospective chart review of patients aged ≥ 18 with OUD who were initiated on methadone in hospital using a divided dose protocol with frequent titration. The primary outcome was adverse events associated with methadone, specifically doses that were held or reduced due to sedation. Secondary outcomes were total daily dose of methadone received on day 1 and 7 of titration.
Results: Of the 168 included patients, 113 (67%) were male, with a median age of 37 (IQR 31 to 44). Stimulant use disorder was a common co-morbidity in 125 (74%) of patients. Sedation events requiring held or reduced methadone doses occurred in 12 (7%) patients, and 2 (1%) patients experienced a serious event either requiring naloxone administration or transfer to an intensive care unit. Of the 135 patients who received 7 days of methadone, the mean dose on day 1 was 41mg (SD 9.6) and on day 7 was 65mg (SD 20.9).
Conclusions: In this inpatient cohort, rapid methadone titration was well tolerated and resulted in patients reaching higher doses of methadone than would be possible with a standard titration schedule, with few adverse events. Given the known effective dose range of methadone, this may result in shorter time to clinical stabilization, and suggests that alternative methadone titration schedules may be a safe and effective approach in specific subpopulations of patients with OUD.

W108. Pharmacy-Level Barriers to Buprenorphine Access: Results From a National Survey of Community Pharmacists

Patricia Freeman[1], Jordan Chael[1], Hannah Cooper[2], Sharon Walsh[1], April Young[1]*
[1]*University of Kentucky*, [2]*Emory University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: A key advantage of buprenorphine over methadone for the treatment of opioid use disorder (OUD) is the ability for it to be prescribed in office-based outpatient treatment programs and dispensed at community pharmacies. However, emerging evidence suggests access to buprenorphine for OUD treatment may be limited at some pharmacies. This study assessed the availability of buprenorphine for OUD at pharmacies, reasons for limiting buprenorphine dispensing and pharmacists' attitudes toward buprenorphine.
Methods: A national convenience sample of independent community pharmacist members of the National Community Pharmacists Association was recruited via email to complete an online survey. Responses (n=473) were collected anonymously over a 4-week period from June 2 through June 30, 2020. Descriptive analyses were conducted, and bivariate analyses employed to determine association between pharmacists' attitudes and buprenorphine availability.
Results: Almost 12% of pharmacists reported not stocking buprenorphine at all, with the main reasons being cited as: no demand (67.3%), concern about diversion (22.4%) and insufficient reimbursement (16.3%). Of those that stock buprenorphine, 17% report limiting the dispensing of buprenorphine in some way, including to only local patients (62.3%), patients of known prescribers (60.7%), or established patients (55.7%). Pharmacists limiting buprenorphine dispensing cited various reasons for doing so including concern about diversion (26.7%), insufficient wholesaler order thresholds (23.3%) and burdensome regulations governing dispensing (13.3%). Stigmatizing attitudes toward buprenorphine were evident with over 1/3 (34.7%) of pharmacists perceiving taking buprenorphine as replacing one addiction with another.
Conclusions: Results from this national survey indicate that access to buprenorphine is limited in some way in 3 of 10 community pharmacies. Efforts to reduce pharmacist stigma and regulatory barriers to buprenorphine dispensing are warranted to ensure patient access to this life-saving medication.

W109. Does Past History of Major Depression Predict New Heroin Onsets?

Villisha Gregoire[1], Alyssa Vanderziel[1], James Anthony[1]*
[1]*Michigan State University*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Substance Use Disorder

Abstract Category Original Research
Aim: Estimates from prior comorbidity studies now link mood disorders with using heroin, but temporal sequencing remains uncertain. In this new project, we offer five replications summarized via meta-analysis, with an aim to study a potentially predictive sequence leading from past DSM-type Major Depressive Disorder (MDD) onward toward heroin use onset during adolescence. If prior MDD onset does not predict later heroin onset, the agenda for future comorbidity research is simplified.
Methods: Each year, 2006-2018, US populations under study included non-institutionalized civilian residents age 12-years-and-older, sampled and assessed using computer-assisted-self-interviews for National-Surveys-on-Drug-Use-&-Health. Standardized items identified past MDD history and subsequent heroin onsets. For 12-17-year old's (n>10,000 each replication), the five analysis-weighted estimates and Taylor series variances are summarized with meta-analysis.
Results: Estimated risk differences (RD) from each individual replication provided little support for a predictive association leading from prior MDD to later adolescent-onset heroin use ($p>0.05$). However, combined using meta-analysis, the estimated summary RD estimate shows excess risk of heroin onsets among youths with past MDD ($p<0.05$).
Conclusions: This new epidemiological research suggests excess heroin incidence among youths with a past MDD history, even when there has been no recent MDD. Individual replication estimates, year-by-year, had led us to think that the prediction would be null, with a simplification for future comorbidity research. The meta-analysis suggests otherwise, and we discuss the implications and future directions for new research on temporal sequencing of mood disorders and heroin onsets.

W110. Reducing Risk of Overdose After Release From Incarceration (ROAR): Preliminary Findings From the Pre-Pandemic Cohort

Elizabeth Waddell[*1], Deza'Rae Collins[1], Robin Baker[1], Tina Bialas[2], Sarann Bielavitz[1], Daniel Hartung[1], Christi Hildebran[3], P. Todd Korthuis[1], Lynn Kunkel[1], Jessica Larsen[1], Joshua D. Lee[4], Sandra Springer[5], Erin Stack[3], Jennifer Wisdom[6], Dawnell Meyer[7]*
[1]Oregon Health & Science University, [2]Bridgeway Recovery Services, [3]Comagine Health, [4]New York University School of Medicine, [5]Yale University School of Medicine, [6]CODA, Inc., [7]Oregon Department of Corrections
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Criminal Justice
Abstract Category Original Research
Aim: "Reducing Overdose After Release from Incarceration" (ROAR) combines initiation of extended-release naltrexone (XR-NTX) with support from Certified Recovery Mentors prior to release and continued support in community to reduce overdose risk among women with OUD.
Methods: Sixty-five participants were enrolled at Oregon's only women's prison between June 2019 and December 2020. Recruitment paused on March 13, 2020 due to the COVID-19 pandemic and resumed in August 2020. Preliminary results are presented for a pre-pandemic cohort released between July 1, 2019 and March 12, 2020 (N=50). Initiation, retention and return to opioid use were assessed using medical records from prison health and community providers and surveys conducted at three- and six-months following release from prison.
Results: Ninety percent of participants accepted XR-NTX prior to release (N=45). Of those, 57% continued XR-NTX at participating community treatment agencies, where 51% were retained on XR-NTX at 2 months; 40% at 3 months; 31% at 4 months; 20% at 5 months; and 13% at 6 months. At 3 months post release, 35 participants (70% of enrolled) completed a follow-up interview where 63% reported current treatment with XR-NTX; 23% reported receiving buprenorphine; and 3 participants reported heroin use of in the past 30 days. At six months post-release, 34 participants (68% of enrolled) completed a follow-up interview where 42% reported current treatment with XR-NTX and 24% reported receiving buprenorphine; 2 participants reported heroin use in the past 30 days. No overdoses have been reported. Fatal and non-fatal overdoses in the year following release will be assessed using state administrative data.
Conclusions: Results suggest high acceptance of pre-release XR-NTX, moderate retention on treatment, and low return to opioid use among a population of women with OUD released from prison. Follow up data indicate a need for an opioid agonist option in addition to XR-NTX at release and in community.

W111. Investigating Extra-Medical Opioid Use and Social Networks Among Persons With Post-Traumatic Stress Disorder

Whitney Cordoba-Grueso[1], Kelly Peck[2], Maria Parker[1]*
[1]Indiana University, [2]University of Vermont

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Epidemiology
Abstract Category Original Research

Aim: Post Traumatic Stress Disorder (PTSD) and extra-medical opioid use (EMOU) frequently co-occur. Although individuals with PTSD frequently perceive low social support, few studies have examined the relationship between EMOU and social support among people with PTSD. Accordingly, this study examined social networks in a sample of people with PTSD in the United States and assessed the association between social networks and past year EMOU.
Methods: Data came from a cross-sectional, nationally representative sample of the National Epidemiologic Survey on Alcohol and Related Conditions-III (individuals aged 18+) from 2012-2013. For persons with past-year PTSD, past year EMOU prevalence was estimated by social network size and diversity. Multivariable logistic regression models examined the association between social network size and diversity and EMOU, adjusting for sociodemographic variables (i.e., age, sex, race/ethnicity, income, education), cigarette use, major depression, and anxiety disorder.
Results: Between 2012-2013, 4.3% of persons with PTSD had past-year EMOU; 0.8% of those with few social ties and 3.5% of those with many social ties had past-year EMOU. The average social network size of individuals with PTSD was 17.5 persons. EMOU was not significantly associated with social network size (AOR=1.03; 95% CI: 0.99, 1.06) or social network diversity (AOR=1.07; 95% CI: 0.72, 1.59).
Conclusions: Among persons with PTSD, the prevalence of past-year EMOU did not differ by social network size or diversity. Perceived strength and quality of relationships may also be important to individuals with PTSD. Future research should further explore EMOU and the proximity of social network members as well as other social network dimensions in this vulnerable population.

W112. Adjunctive Treatments to Office-Based Buprenorphine for Addiction-Related Outcomes: A Systematic Review of the Evidence

Jessica Wyse[1], Ben Morasco[2], Jacob Dougherty[3], Beau Edwards[4], Devan Kansagara[2], Stephan Lindner[5], Adam Gordon[6], P. Todd Korthuis[1], Anders Herreid-O'Neil[2], Anais Tuepker[5], Travis Lovejoy[2]*
[1]Oregon Health & Science University, [2]VA Portland Health Care System, [3]Midwestern University, [4]VA Portland Healthcare System, [5]Oregon Health & Sciences University, [6]University of Utah School of Medicine and VASLCHCS

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Health Services
Abstract Category Original Research

Aim: As medication treatment of opioid use disorder (MOUD) has increasingly shifted from specialty substance use disorder to office-based settings, research identifying adjunctive treatments to improve outcomes and strategies to enhance engagement and retention are needed. We conducted a systematic review of the literature addressing adjunctive therapies and interventions provided alongside standard medical management (SMM) of buprenorphine, and the effect of adjuncts on key outcomes.
Methods: Data sources included Medline, Cochrane Central Register of Controlled Trials, CINAHL, and PsycINFO from inception through January 2020, as well as ClinicalTrials.gov, WHO International Clinical Trials Registry Platform (ICTRP) and conference abstracts via Embase. Original research examining adjunctive interventions paired with SMM of buprenorphine among adults for treatment of opioid use disorder was included. Two raters independently reviewed abstracts and full text articles; disagreements were resolved by consensus. To evaluate risk of bias, we utilized the Cochrane ROB-2 for randomized studies, and the Newcastle-Ottawa scale for non-randomized studies with a comparator arm.
Results: Twenty articles were included in the final review. Of 11 included RCTs, 5 were low ROB, 4 some concern, and 2 high ROB. Most studies examined psychosocial interventions (n=13). Few studies examined complementary and integrative therapies (e.g. mindfulness, yoga; n=3) or technological interventions (e.g.

electronic pill dispensation, telephonic support; n=3), one study examined patient navigators (n=1), and no studies examined interventions addressing social determinants of health. Among studies comparing psychosocial interventions with standard medical management (SMM), we found little evidence that any psychosocial intervention evaluated improved addiction-related outcomes over SMM alone.
Conclusions: Given findings from high quality research, clinicians practicing in settings that lack ready access to adjunctive psychosocial services should not view this lack of access as a barrier to providing buprenorphine. Adjunctive interventions supportive of key addiction-related outcomes in office-based buprenorphine treatment have yet to be identified.

W113. Multivariate Pattern Analysis Links Drug Use Severity to Distributed Cortical Hypoactivity During Emotional Inhibitory Control in Opioid Use Disorder

Zhenhao Shi[1], Charles P. O'Brien[1], Anna Rose Childress[1], Daniel D. Langleben[1], Corinde E. Wiers[1]*
[1]*University of Pennsylvania Perelman School of Medicine*
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Imaging
Abstract Category Original Research
Aim: The ability to regulate prepotent behavioral responses to emotionally salient stimuli, i.e. emotional inhibitory control, is central to effective coping with real-life emotional and cognitive challenges. In patients with opioid use disorder (OUD), poor emotional inhibitory control may contribute to the perpetuation of OUD and treatment failure. Here we used functional magnetic resonance (fMRI) and multivariate pattern analysis (MVPA) to investigate the neural representation of emotional inhibitory control and its association with drug use severity and craving in OUD. We hypothesized that reduced frontoparietal activity would be associated with more severe drug use and craving.
Methods: Twenty-six OUD patients completed an fMRI affective go/no-go task that required responses to frequently presented appetitive “go” stimuli, and inhibition of responses to infrequently presented aversive “no-go” stimuli. The cortex was subdivided into 1000 functionally homogeneous parcels. Neural response to “no-go” vs. “go” stimuli was subjected to MVPA using partial least squares regression (PLSR), which identified a multivariate pattern that predicted drug use severity measured before fMRI. We also examined whether drug use severity and the multivariate brain response pattern were predictive of opioid craving at baseline and during subsequent treatment with opioid antagonist naltrexone.
Results: Greater drug use severity was associated with a more pronounced pattern of brain hypoactivity across the frontoparietal cortices. While both greater drug use severity and lower brain response predicted greater opioid craving at baseline, only brain response predicted future craving during naltrexone treatment.
Conclusions: Our findings point to widespread functional hypoactivity in brain regions underlying emotional inhibitory control that is linked to drug use severity in OUD. Such a distributed pattern is consistent with the multifaceted nature of OUD that affects multiple brain networks. It also highlights the power of the MVPA approach in uncovering large-scale cortical substrates associated with clinical severity of complex psychiatric disorders and in predicting treatment response.

Virtual Poster Q&A Session III: Polydrug

W114. Assessment of Potential Sober Supports Among Pregnant and Parenting Women With Substance Use Disorder

Alexis Hammond[1], Denis Antoine[1], Michael Kidorf[2]*
[1]*Johns Hopkins University School of Medicine,* [2]*Johns Hopkins Bayview Medical Center*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: This study evaluated the presence of drug-free family and friends in the social networks of pregnant and parenting women with substance use disorders (SUDs), treated at the Center for Addiction and Pregnancy (CAP). Activation of drug-free social networks holds potential to improve social & recovery support, & adherence to appointments & medication pick up.

Methods: Social network interviews (Kidorf et al. 2016) were preliminarily conducted with 26 CAP patients.
Results: CAP women reported that most people in their network were drug-free (M = 4.3 drug-free members; 5.2 total members), and most women (85%) endorsed their willingness to bring at least one drug-free family or friend to the program to support recovery efforts. CAP women were most interested in receiving support for the following recovery behaviors: watching their children (96%), attending NA/AA (81%), speaking with treatment providers (76%), and connecting to SUD treatment (73%). When asked about obstacles to remaining in treatment, CAP women reported: 1) financial worries (65%), 2) taking medication for too long (50%); 3) interference with other responsibilities (46%); 4) lack of transportation (39%), and 5) criticism for taking agonist medications (27%).
Conclusions: Taken together, these findings demonstrate that CAP women possess sufficient drug-free support, identify recovery obstacles that might be effectively managed with the help of community support, and express interest in activating drug-free family or friends to sustain agonist treatment.

W115. Effects of Legalizing Medicinal Marijuana on Prescription Use and Misuse Among Older Adults

Alyssa Falise[1], Sara Nutley[1], Catalina Lopez-Quintero[1], Shawnta Lloyd[1], Catherine Striley[1]*
[1]University of Florida
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: Nearly 75% of the United States has approved use of legal medicinal marijuana (LMM), and research shows that these policies are associated with increased substance use, potentially due to rising accessibility. LMM's impact on use and misuse of prescription drugs has not been well studied in older adults, despite the potential for increased recommended and prescribed co-use and its potential adverse drug interaction. Accordingly, this analysis evaluates the association between residing in states with LMM and rates of past 12-month substance use and prescription misuse among older adults.
Methods: Data from 44,007 adults aged 50+ were collected through the 2015-2019 National Survey on Drug Use and Health and included self-reported past 12-month use and misuse of marijuana, alcohol, tobacco, and prescription medications (i.e. stimulants, sedatives, tranquilizers, and pain relievers). State law at time of interview was used to determine residency in states with LMM. Logistic regression models assessed variation in substance use and use/misuse of prescription medications by residency in LMM states.
Results: Approximately 2 in 3 older adults live in states with LMM (67.3%), and these participants were significantly more likely to report past 12-month marijuana (OR = 1.37, 95% CI: 1.18–1.60) and alcohol (OR = 1.27, 95% CI: 1.17–1.38) use, but less likely to use tobacco products (OR = 0.80, 95% CI: 0.73–0.87). Rates of prescription pain reliever use were significantly lower among those in LMM states (OR = 0.92, 95% CI: 0.86–0.98); use and misuse of all other prescriptions did not differ by state-level LMM authorization.
Conclusions: Results from this analysis indicate that residing in a state with LMM is associated with reduced use of prescription pain relievers and tobacco, yet increased use of alcohol and marijuana among older adults. Further research is needed to identify specific state-level policy elements influencing patterns of use among alder adults.

W116. Polysubstance Use Among Cocaine Users: An Examination of Combination Patterns Between Weekday and Weekend Use

Anna Wang[1], Nicole Fitzgerald[1], Brenton Collinsworth[1], Yiyang Liu[1], Catherine Striley[1], Linda Cottler[1]*
[1]University of Florida
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Substance Use Disorder
Abstract Category Original Research
Aim: Despite the fact the majority of individuals who use cocaine also use other substances, there is a lack of research on temporal patterns of polysubstance use this population. Understanding combinations of polysubstance use is vital, as the pattern of consumption can lead to different effects and outcomes. The current investigation sought to examine patterns of cocaine use with alcohol and marijuana and to identify differences in weekday versus weekend use.

Methods: Structured retrospective interviews were conducted with 170 participants (aged 18-65 years for both sexes) who reported cocaine use within the past 30 days. Data captured frequency of cocaine use consumption with alcohol and/or marijuana for the past 30 days. Time-series analysis was based on categorical combinations to identify common patterns of use between weekdays (Monday to Friday) and weekends (Saturday and Sunday).
Results: Overall, the most frequently reported pattern among individuals (n=24) was one or more days of cocaine, alcohol, and marijuana (CAM) use and one or more days of marijuana only (M) for same-day use. For the pattern of CAM and M only use within the day over a 30-day period, the reported CAM use was an average of 0.96 days during weekdays, an average of 2.91 days during weekends, and an average of 3.88 days overall. M-only use averaged 15.46 days during weekdays, with an average of 11.5 days during weekends and 26.96 days overall, over a 30-day period.
Conclusions: Polysubstance use is common among persons who use cocaine. The most prevalent daily polysubstance use pattern identified involved days where all three substances were used, and marijuana only was used. For different combinations of use, weekend use was typically greater than weekday for most substance use patterns. Future analyses will include examining quantity of use as well as determining consumption order between weekday and weekend use.

W117. Relationship Between Addictive Personality Factors and Exercise Attitudes and Behaviors

Rachel Arnold[1], Leila Islam[2], Dace Svikis[1]*
[1]Virginia Commonwealth University, [2]Virginia Commonwealth University Health
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: The present study examined associations between personality characteristics and measures of nutrition and physical activity in a residential SUD treatment sample of women.
Methods: Participants were 82 women recruited during residential treatment. All provided informed consent to a research health interview and received $20 for their time. The present study examined addictive personality factors (Anxiety Sensitivity, Hopelessness, Impulsivity, Sensation Seeking) from Substance Use Risk Profile Scale (SURPS), Barriers to Being Active (BBAQ) (i.e., social influence, lack of resources), Body Mass Index (BMI) and daily Metabolic Equivalent of Task (MET). T-tests were utilized to examine differences between participants with different primary drugs of abuse and bivariate correlations were performed to examine the relationship between SURPS scores and other health/nutrition related variables.
Results: The sample was predominantly black (70.6%) with mean age of 40.2 (9.45). No significant differences in SURPS subscale scores were found between patients with different grouped by primary drug of abuse, which included Cocaine/crack (36.5%); Heroin (37.6%) and Alcohol (11.8%). When SURPS and BBAQ subscales scores were examined, two significant associations were found: SURPS Hopelessness scores were positively correlated with BBAQ Social Influence scores [$r(81) = .360$, $p = .016$] and SURPS Sensation Seeking scores were negatively correlated with BBAQ Lack of Skill scores [$r(81) = -.338$, $p = .025$]. All other comparisons were nonsignificant. There was no significant relationship between SURPS subscale scores with BMI nor MET.
Conclusions: The limited significant correlations between SURPS scores and other variables may indicate a lack that the measured personality dimensions are not a strong predictor of other health behaviors. Further research is needed to understand if the significant relationships found were due to the predictive power of SURPS on attitudes about exercise or due to an underlying individual characteristic not measured or controlled for in this experiment.

W118. DOPE: A Package for the R Language to Process/Classify Drug Names

Raymond Balise[1], Gabriel Odom[2], Layla Bouzoubaa[1], Sean Luo[3], Daniel Feaster[4]*
[1]University of Miami, [2]Florida International University, [3]Columbia University, [4]University of Miami Miller School of Medicine
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Technology (e.g., mHealth)
Abstract Category Original Research

Aim: This project provides technology to synthesize and harmonize drug names from multiple sources, allowing researchers to look up drugs by "brand", "generic" or "street" names.
Methods: This technology has built a lexicon with drug names grouped into 11 categories (i.e., stimulants, depressants, designer drugs, etc.) and 41 classes (e.g., amphetamines, cocaine, etc.) based on categorization provided by the DEA and synonyms/slang provided on publicly available websites. Inconsistencies in the DEA classification and with slang terms were adjudicated by the study team with help from clinical investigators.
Results: An R software package, named DOPE (Drug Ontology Parsing Engine) is available (www.github.com/CTN-0094/DOPE). It contains the datasets and a function needed to parse a set of potential drug names and classify them by their class and type. The functions automatically classify any sets of words, which can be a mixture of slang or formal names. An additional function provides summaries when a drug type/class is ambiguous or if a substance is a combination of multiple drugs (i.e., speedball).
DOPE can be the backbone for future data science projects, allowing people to efficiently collect and synthesize drug data while dealing with ambiguous terms. For example, DOPE can be used during data collection to prompt clarification for uncommon slang that the DEA has identified, such as "cheese", which can refer to heroin, marijuana or methamphetamine.
Conclusions: The DOPE R package provides a convenient way to process free-form text, like notes or time-line-follow-back files.

W119. Describing Community Health Worker Implementation of WORTH Transitions, an Evidence-Based Program for Justice Involved Women With Substance Use Disorders and HIV Risk

Diane Morse[1], Zainab Shah[1], Karen Johnson[2], Lisa Puglisi[3], Amali Epa-Llop[1], Johanna Elumn[3], Kiranpreet Sekhon[1], Emily Wang[3], Nabila El-Bassel[4], Louisa Gilbert[4], Timothy Hunt[4]*
[1]University of Rochester School of Medicine, [2]University of Alabama, [3]Yale University School of Medicine, [4]Columbia University
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Criminal Justice
Abstract Category Original Research
Aim: Women recently released from incarceration are at greater risk for HIV, Hepatitis C, substance use, trauma, and mental health disorders. To address these problems, we aim to assess community health worker (CHW) perceptions and fidelity in the context of implementing WORTH Transitions, a combination of two evidence-based programs: Women on the Road to Health (WORTH) and Transitions Clinic (TC).
Methods: WORTH is a structured five-session intervention, efficacious in decreasing HIV risk behaviors, intimate partner violence episodes, and substance use among justice-involved women. TC provides culturally informed primary care and peer navigation to those reentering from incarceration, and is efficacious in improving health and retention in care. We used the Consolidated Framework for Implementation Research (CFIR) to evaluate implementation strategies, facilitators and barriers to care, and contextual factors of WORTH Transitions. For this abstract, we describe the CFIR “characteristics of individuals” construct by focusing on the three CHWs who implemented the WORTH Transitions program. As peer CHWs, they shared socioeconomic status and life experiences with the community members they served, in this case women recently released from incarceration. We conducted and used thematic qualitative analysis of CHW interviews both midway and at the conclusion of the project in a pragmatic design to inform retention strategies. We also analyzed CHW performance with the WORTH fidelity checklist.
Results: Themes from the interviews included: how CHWs addressed challenges to engagement, CHW processes for client empowerment, and positive impacts on the CHWs themselves from conducting the program. The midway interviews helped to enhance participant retention.
Conclusions: CHWs were able to learn and implement an evidence-based intervention effectively for women with whom they share life experiences. These findings promote implementation of needed evidence-based programs for justice-involved women and build the knowledge base for needed research on efficacy of peer-driven and implemented approaches in this population.

W120. A Randomized Trial of CBT4CBT for Women in Residential Treatment for Substance Use Disorders

Dace Svikis[1], Sydney Kelpin[1], Anna Beth Parlier-Ahmad[1], Nancy jallo[1], Kathleen Carroll[2]*
[1]*Virginia Commonwealth University*, [2]*Yale University*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: Despite the effectiveness of cognitive behavioral therapy (CBT) for substance use disorder, its dissemination in clinical practice is limited due to a range of barriers (e.g., time, cost). Computer-based training for cognitive behavioral therapy (CBT4CBT) offers an opportunity to improve the quality and reach of SUD treatment services that is both feasible and cost-effective. The present study expanded on current research supporting the use of CBT4CBT in outpatient settings and examined the intervention as an adjunct to residential treatment for women with SUDs.
Methods: A two-arm clinical trial compared women randomized to either standard residential treatment plus access to the CBT4CBT program (N = 34) or residential treatment alone (TAU; N = 29). Assessments occurred at baseline, discharge from residential care, and at 4 and 12-weeks post-discharge. The two groups were compared over the 12-week follow-up period on relapse to any substance (Y/N), relapse to primary substance (Y/N), and days of use using chi-square for categorical and t-tests for continuous measures. A Kaplan-Meier analysis was also performed to compare the two groups on time to relapse.
Results: Demographically, the sample was predominantly African American (79.4%), with a mean age of 41.2 years (SD = 12.1). Although the present study was not powered for statistical significance, findings were in the predicted direction, with women in the CBT4CBT group reporting lower likelihood of relapse to primary substance (30.4% vs. 47.6%, p = 0.24), fewer days of primary substance use (3.4 days vs. 9.2 days, p = 0.16), and longer time to relapse (23.1 days vs. 19.4 days) in the follow-up period compared to TAU.
Conclusions: The present study expanded on the current literature supporting the use of CBT4CBT in outpatient settings and provides benchmark data on the use of CBT4CBT in a residential treatment program for women with SUDs.

W121. Cannabis and Cigarette Use Among Pregnant Women in Outpatient Treatment for OUD

Michelle Eglovitch[1], Anna Wiese[1], Anna Beth Parlier-Ahmad[1], Caitlin Martin[1], Dace Svikis[1]*
[1]*Virginia Commonwealth University*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Prenatal/Perinatal
Abstract Category Original Research
Aim: Prenatal cannabis use is rising. In the high-risk subgroup of women with opioid use disorder (OUD), cannabis and cigarette use clinically often go unrecognized or unaddressed. The present study: 1) characterizes cannabis and cigarette use among pregnant women in outpatient OUD treatment and 2) explores the relationship between such use and pain, sleep, anxiety and depressive symptoms.
Methods: This is a secondary analysis of baseline data from a longitudinal study investigating recovery among postpartum women with OUD. The parent study is actively enrolling adult women receiving buprenorphine for OUD in their third trimester of pregnancy. At baseline participants report lifetime and recent substance use histories as well as complete the following measures: Cannabis Abuse Screening Test (problematic cannabis use), Fagerstrom Test (nicotine dependence), Brief Pain Inventory, Pittsburgh Sleep Quality Index, Patient-Reported Outcomes Measurement Information System (anxiety and depressive symptoms). Women with and without continued cannabis and cigarette use during pregnancy are compared using chi-square and t-tests.
Results: Participants (N=15) are predominantly White (67%) with a mean age of 30 (SD=6) and gestational age of 33 (SD=4) weeks. Many (73%) smoked cigarettes prior to pregnancy (mean cigarettes/day=16+11). Most continued to smoke during pregnancy (82%); of those, 17% were categorized as having a high level of nicotine dependence. All women reported lifetime regular (3x/week) cannabis use; 33% continued cannabis use in pregnancy. All women who continued use in pregnancy had a history of problematic cannabis use. Continued cannabis, but not cigarette, use in pregnancy was significantly correlated with both current pain (p=.041) and worst pain in the last 24 hours (p=.010). Neither cannabis nor cigarette use during pregnancy were associated with sleep, anxiety or depressive symptoms.

Conclusions: Among pregnant women receiving buprenorphine, polysubstance use continues, despite regular interactions with healthcare providers. Evidence-based tailored strategies to address polysubstance use for women in OUD treatment are needed.

W122. Feasibility and Acceptability of Using Smartphone-Based EMA to Assess Patterns of Prescription Opioid and Medical Cannabis Use Among Individuals With Chronic Pain

Erin Anderson Goodell[*1], *Courtney Nordeck*[1], *Patrick Finan*[2], *Ryan Vandrey*[3], *Kelly Dunn*[3], *Johannes Thrul*[1]
[1]*Johns Hopkins Bloomberg School of Public Health,* [2]*Johns Hopkins Hospital,* [3]*Johns Hopkins University School of Medicine*

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Technology (e.g., mHealth)
Abstract Category Original Research

Aim: Intensive longitudinal studies are needed to examine the co-use of prescription opioids and cannabis and their effects on chronic pain. The current study sought to investigate the feasibility and participant compliance with a smartphone-based Ecological Momentary Assessment (EMA) data collection protocol among individuals who use multiple substances and suffer from chronic pain.
Methods: A total of 46 participants (mean age = 44.8 years; 78.3% female; 84.8% Non-Hispanic White) were recruited online and completed a 30-day EMA phase where they responded to prompted surveys (four random past-hour surveys and one daily diary per day) about opioid use, cannabis use, and pain symptoms. Qualitative follow-up interviews were conducted with a subset of 10 participants. Linear and logistic regression models were used to examine baseline participant characteristics and study process-related characteristics related to EMA compliance. Qualitative indicators of participant study experience were extracted from interviews.
Results: Participants responded to an average of 70.2% of past-hour surveys and 91.9% of daily diaries. Female participants were more likely to complete all daily diaries and at least one past-hour survey per day on all 30 days, respectively (OR=5.60, 95% CI: 1.02-30.77, p<.05; OR=7.08, 95% CI: 1.28-39.16, p<.05). Female participants were also more likely to complete at least 75% of their prompted past-hour surveys (OR=4.67, 95% CI: 1.00-21.69, p<.05). Interview participants reported a positive study experience overall, although some mentioned problems related to smartphone notifications, redundant questions, or being prompted when they were not feeling well. A few participants mentioned problems with reporting the amount of cannabis used (e.g., milliliters of vaping liquid).
Conclusions: Study results demonstrate both feasibility and acceptability of using EMA methodology to examine use patterns of medical cannabis and prescription opioid medication among individuals with chronic pain.

W123. Substance Use, Sexual Risk, and HIV Testing Among Emergency Department Patients Aged 13 – 24 Years

Ian Aronson[*1], *Jingru Zhang*[2], *Sonali Rajan*[2], *Mobolaji Ibitoye*[3], *Lisa Marsch*[4], *Mona Bugaighis*[5], *Lauren Chernick*[5], *Don Des Jarlais*[1]
[1]*New York University College of Global Public Health,* [2]*Columbia University,* [3]*Ohio State University,* [4]*Dartmouth College,* [5]*Columbia University Medical Center*

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Technology (e.g., mHealth)
Abstract Category Original Research

Aim: Despite federal guidelines, many adolescents are not offered HIV testing often due to perceptions of low behavioral risk by healthcare providers. The current study examines relationships between substance use, sexual risk, and HIV testing among emergency department patients aged 13 – 24 years who completed the Mobile Augmented Screening (MAS) tool, a tablet-based intervention intended for high volume clinical settings.
Methods: Participants (n=147) used tablet computers to report risk behaviors and view a five-minute video designed to increase HIV testing. At the end of the intervention, the tablets asked patients if they would like an HIV test. A series of Chi-Square analyses were used to determine participants' likelihood of accepting an HIV test by behavioral characteristics including self-reported substance use and sexual risk.
Results: Approximately 50.34 percent of participants (n=74) reported having sex in the past year, 19.05 percent (n=28) reported sex with more than 1 partner in the past year, and 29.25 percent (n=43) reported condomless sex.

Almost half (n=69) reported some type of substance use in the past 3 months. Sexual risk was a significant predictor of HIV testing (25 out of 53 participants reporting sexual risk tested for HIV versus 14 out of 94 who did not, chi-squared = 16.50, $p < .001$). Problem substance use (e.g. trying but failing to quit) also predicted testing (16 out of 35 participants reporting problem substance use tested for HIV versus 23 out of 112 who did not, chi-squared = 7.43, $p < 0.01$).
Conclusions: Findings suggest the value of routine automated risk screenings followed by computer-based HIV test offers as a way to potentially facilitate more thorough risk reporting, and to increase HIV testing among young patients who otherwise might not test.

W124. Perceived Addictiveness of Marijuana, Tobacco and Alcohol Use in Vermont Youth and Young Adults: Associations Between Addiction Perceptions, Sociodemographics, and Substance Use

Julia West[1], Keith B. Burt[1], Elias M. Klemperer[1], Harry L. Chen[2], Andrea C. Villanti[1]*
[1]*University of Vermont,* [2]*Vermont Department of Health*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Prevention
Abstract Category Original Research
Aim: Dual and poly-tobacco and substance use are increasingly prevalent in youth and young adults (YAs). Current substance use prevention media efforts target addiction perceptions in young people; however, little is known about the young people's beliefs about the addictiveness of multiple substances. The goal of the current study is to examine youth and YA addiction perceptions across several substances and the associations between perceived addictiveness and substance use.
Methods: Data were collected in 2019 (Waves 1 and 2) as part of PACE Vermont, an online cohort study of Vermonters aged 12-25. Latent class analyses grouped participants by responses to an item that assessed perceived addictiveness of nicotine, caffeine, alcohol, marijuana, cigarettes, electronic vapor products, and opioids. Bivariate and multivariable multinomial logistic regression estimated relative risk ratios for correlations between latent classes and sociodemographics and substance use among Vermont youth and YAs.
Results: Four emergent latent classes were defined as: 1) high perceived addictiveness (n=346; 30%), 2) low perceived addictiveness of marijuana (n=684; 59%), 3) mixed addiction perceptions (n=93; 8%), and 4) low perceived addictiveness (n=45; 4%). Latent class membership was associated with sociodemographics and current and ever substance use. For each year increase in age, there was a 44% increased likelihood of being in Class 2 compared to Class 1. Each year increase in age corresponded with a 42% increased likelihood of belonging to Class 3 compared to Class 1.
Conclusions: Findings from this study provide novel evidence that youth and YA beliefs about addictiveness across substances are correlated with substance use behaviors and demographic factors, including age. The strong association between age and classes defined by low and mixed perceived addictiveness suggests differences in addiction perceptions in youth compared to YAs. These associations signal novel opportunities to target addiction perceptions in messaging to YAs as well as youth to prevent substance use.

W125. Within-Group Differences in Maladaptive Eating, Trauma, and Substance Use Among Black and White Women

Kierra Pean[1], Alexandria Bauer[1]*
[1]*Rutgers University*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Racial/Ethnic Differences
Abstract Category Program Descriptions
Aim: Black women are more likely to experience trauma and co-occurring substance use. In addition, they are targeted by unrealistic body image ideals, which increases risk for eating disorders. The aims of this analysis were to determine whether posttraumatic stress disorder (PTSD) or substance use were predictors of eating disorder (ED) symptoms among Black and White women.
Methods (Optional): Survey data was originally collected for the National Institute on Drug Abuse's (NIDA) National Drug Abuse Treatment Clinical Trials Network (WTS, CTN-0015) Women and Trauma study that

evaluated the effectiveness of Seeking Safety, a program for the treatment of women with co-occurrring PTSD and substance use disorders (SUD), compared to Women's Health Education. Participants were Black women (n = 146) and White women (n = 195) with an average age of 38.3 (SD = 9.8) from either arm of the study.
Results (Optional): White women had significantly higher global eating disorder scores on the Eating Disorder Examination Questionnaire (M = 1.63, SD = 1.18) than Black women (M = 1.01, SD = 1.12), t(114) = 2.841, p = .005. Linear regression demonstrated that among White women, baseline PTSD symptoms were significantly related to global eating disorder scores (β = .275, p = .025), as well as shape concerns (β = .338, p = .006) and weight concerns (β = .367, p = .002). Among African American women, baseline PTSD symptoms were significantly related to weight concerns only (β = .296, p = .026). However, substance use was significantly associated with global eating disorder scores (β = .419, p = .001), shape concerns (β = .370, p = .005), and weight concerns (β = .400, p = .001).
Conclusions: These findings have potential to improve clinical diagnosis and treatment of co-occurring disorders for diverse clients, particularly given intersectional influences on PTSD, SUD, and ED symptoms.

W126. Alcohol Intoxication or Withdrawal After Buprenorphine or Naltrexone Initiation in Individuals With Alcohol and Opioid Use Disorders

Marco Tori[*1], Samantha Malatesta[2], Jake Morgan[3], Alexander Walley[3], Marc Larochelle[3]*
[1]Boston Medical Center, [2]Boston University School of Public Health, [3]Boston University School of Medicine
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Treatment
Abstract Category Original Research
Aim: Among people with co-occurring opioid use disorder (OUD) and alcohol use disorder (AUD) in a commercially insured cohort, we examined rates of treatment with medication for OUD (MOUD) and compared alcohol intoxication or withdrawal incidence rates after initiation of buprenorphine or naltrexone to no treatment.
Methods: We identified a retrospective cohort of individuals 18-64 years old in the MarketScan Commercial Claims and Encounters Database, a nationally representative insurance database, with a diagnosis of AUD in the 90 days prior to a new diagnosis of OUD between October 1, 2015 and December 31, 2017. We identified receipt of buprenorphine or naltrexone as time-varying exposures using pharmacy claims. We followed individuals through 2017 to measure the outcome of alcohol intoxication or withdrawal (AIW) claim. We calculated AIW adjusted incidence rates (aIR) for 4 distinct groups: time on buprenorphine, time on naltrexone, time untreated (including before initiating MOUD), and time untreated after discontinuing MOUD. We adjusted for age, sex, geographic region, relationship to enrollee, and severity of AUD.
Results: In the cohort of 7,039 individuals with both AUD and OUD, 897 (12.7%) were treated with buprenorphine for a median duration of 20.2 weeks (SD 23.1) and 1,526 individuals (21.7%) were treated with naltrexone for a median of 13.4 weeks (SD 13.7). The aIR of AIW during buprenorphine receipt was 147 events/100,000 person-weeks (95% CI 110-195) and during naltrexone receipt was 388 events/100,000 person-weeks (95% CI 311-484). For time untreated, the aIR of AIW was 569 events/100,000 person-weeks (95% CI 527-615). The aIR for time after discontinuing MOUD was 604 events/100,000 person-weeks (95% CI 544-670).
Conclusions: In co-occurring OUD and AUD, buprenorphine and naltrexone are underutilized treatment modalities. The incidence of alcohol intoxication or withdrawal is higher before and after MOUD treatment than during treatment and lowest when treated with buprenorphine.

W127. Loneliness and Substance Use During the COVID-19 Pandemic Among Older Adults

Marilyn Horta[*1], Tian Lin[1], Sarah Peeling[1], Amber Heemskerk[1], Nathan Spreng[2], Gary Turner[3], Natalie Ebner[1]*
[1]University of Florida, [2]McGill University, [3]York University
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Lifespan (Infant, Adolescent, Aging)
Abstract Category Original Research
Aim: Greater loneliness is associated with substance use in older adults. Older adults are at high-risk for contracting COVID-19 and public health guidelines recommend limiting physical contact, which has reduced social exchange. Exacerbation of negative emotional states can also increase the potential for relapse, overdose, and mortality among older adults. As part of a longitudinal, multi-site study this report examined self-reported

loneliness and substance use (i.e., alcohol and non-prescribed drugs) among older adults in Florida during the COVID-19 pandemic.
Methods: Thirty-seven older individuals (65% women, 53-80 years) self-reported their feelings of loneliness and substance use before (i.e., retrospectively, Session 0) and during (biweekly, Sessions 1-3) COVID-19 related social distancing. Separate repeated-measures ANOVAs were conducted on average loneliness, alcohol use, and drug use scores over Sessions 0-3.
Results: Loneliness did not significantly change over Sessions 0-3 ($F(2.6,92.9)=2.5$, $p=0.07$, $\eta2=0.07$) but, as expected, loneliness significantly increased ($p=0.009$) between Session 0 ($M=2.2$, $SD=1.2$) and Session 2 ($M=2.5$, $SD=1.4$). Similarly, frequency of drinking per week ($F(2.6,94.8)=2.1$, $p=0.12$, $\eta2=0.05$) and per day ($F(2.2,80.2)=1.0$, $p=0.38$, $\eta2=0.03$) did not significantly change over Sessions 0-3, but drinking per week significantly decreased between Session 0 ($M=1.6$, $SD=1.6$) and Session 1 ($M=1.3$, $SD=1.6$) ($p=0.03$). Frequency of drug use per week ($F(1.8,64.9)=0.1$, $p=0.89$, $\eta2=0.00$) and per day ($F(2.1,74.7)=0.4$, $p=0.68$, $\eta2=0.01$) were not impacted over time.
Conclusions: These preliminary findings provide a snapshot of how older adults have coped during the pandemic. While feelings of loneliness and substance use were overall not significantly impacted during the pandemic in this sample, there is some evidence of acute increased loneliness and decreased weekly drinking. Future analysis will assess the full trajectories of loneliness and substance use, and their interplay, using multilevel cross-lagged modeling across 6 Sessions from 4 sites in the US and Canada; and will incorporate self-reported pain, stress, and sleep data and Time as a covariate.

W128. Association of Simultaneous Alcohol and Cannabis Use With Driving Under the Influence of Alcohol and Cannabis in the United States, 2016-2019

Priscila Gonçalves[*1], Luis Segura[1], Joao Mauricio Castaldelli-Maia[1], Silvia Martins[1], Pia Mauro[1]*
[1]Columbia University
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research
Aim: To investigate whether simultaneous alcohol/cannabis use was associated with past-year driving under the influence of alcohol-only (DUI-A), cannabis-only (DUI-C), or both alcohol and cannabis (DUI-AC).
Methods: We included participants ages 16+ and older (n=120,261) reporting past-year alcohol and/or cannabis use in the 2016-2019 National Survey on Drug Use and Health. We defined simultaneous alcohol/cannabis use as using marijuana/hashish at the same time or within a couple of hours of last alcohol use. We created four DUI categories based on whether participants had driven under the influence of 1) alcohol-only, 2) cannabis-only, 3) both alcohol and cannabis, or 4) no DUI in the past 12 months. Weighted multinomial logistic regression was used to obtain adjusted relative risk ratios (aRRR) of DUI categories by simultaneous alcohol/cannabis use, adjusting for sociodemographics and past-year alcohol and cannabis frequencies.
Results: In this sample, 18% of respondents reported any past-year DUI (i.e., 9.36% DUI-A, 5.40%, DUI-C, and 3.24% DUI-AC). Compared to respondents without DUI, individuals reporting simultaneous alcohol/cannabis use had 3.37 times the likelihood of DUI-C (95% CI=2.80-4.05); and a 4.93 of DUI-AC (95% CI=3.90-6.22), but not DUI-A (aRRR 1.17, 95% CI= 0.85-1.61). Ages 21-49 years old, male gender, non-Hispanic white race/ethnicity, and higher income were associated with DUI outcomes. For example, men were 1.45 times more likely to report DUI-A (95% CI= 1.35-1.56), and 1.59 times more likely to report DUI-AC (95% CI= 1.39-1.81) than women.
Conclusions: Simultaneous alcohol/cannabis use was strongly associated with DUI-C and DUI-AC. Educational campaigns and DUI prevention policies should target groups with higher self-reported DUI patterns, such as non-Hispanic white and male adults. Given the relatively high cannabis-involved DUI prevalence, investments in measurement of cannabis-related driving impairment should be prioritized.

W129. Digital Health Interventions for Mental Health and Substance Use Disorders in the Criminal Justice Population: A Scoping Review

Rebecca Leach[*1], Stephanie Carreiro[1], Paige Shaffer[1], Ayorkor Gaba[1], Smelson David[1]*
[1]University of Massachusetts Medical School
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)

Topic Technology (e.g., mHealth)
Abstract Category Literature Review
Aim: Substance use disorder (SUD), mental health disorders (MHD), and co-occurring disorders (COD) are common in the criminal justice population, and current treatments lack efficacy. Digital health interventions (DHI) represent an opportunity to expand and improve treatment, but data are lacking. The current scoping review aims to: (1) To describe studies involving DHIs for MHD, SUD, or COD in the criminal justice population, and (2) to determine impact on justice, substance, and mental health-related outcomes.
Methods (Optional): A search for articles published from 2015 through April 2020 was conducted in PubMed in accordance with PRISMA guidelines. Inclusion criteria were: 1) focus on criminal-justice involved individuals 2) focus for SUD, MHD, and/or COD, and (3) use of a DHI. Standardized tools were used for data abstraction and quality assessment.
Results (Optional): Fourteen articles were included in the final review. The majority of the articles were rated as fair quality. The most common focus was SUD, and the most common population type was community supervision, including probation or parole. The most common modalities for DHIs were telehealth and computer assisted interventions. No DHIs used wearable devices or other sensor technology, and no study included juveniles. Most of the DHIs were utilized as an adjunct to treatment as usual, with only three testing DHIs as standalone interventions. Feasibility and acceptability were high, and the few studies that measured substance and mental health-related outcomes reported equivocal or positive results. No studies focused on recidivism, return to use, or engagement in treatment.
Conclusions: Literature on DHIs for criminal justice involved populations diagnosed with SUD, MHD and COD is limited, and largely focuses on telehealth and eHealth, with less data on mHealth approaches. Future research should focus on the inclusion of diverse populations, the inclusion of objective monitoring tools and leveraging of peer support personnel.

W130. Functional Response Inhibition to Appetitive Face Stimuli Among Adolescent and Young Adult Alcohol and Cannabis Use

Ryan Sullivan[1], Alexander Wallace[1], Krista Lisdahl[1]*
[1]*University of Wisconsin-Milwaukee*

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Imaging
Abstract Category Original Research
Aim: Brain response to appetitive face stimuli differs across development, with increased limbic activation observed in adolescence and young adulthood. Studies investigating effects of alcohol and cannabis on affective response activation have demonstrated differences in frontal, cerebellar, limbic, and parietal regions. However, minimal studies have investigated inhibitory response to appetitive stimuli. Here, we examined associations between alcohol and cannabis use on functional activation elicited by happy faces during a response inhibition trials.
Methods: Ninety adolescents and young adults (age, M=21.2; female, 45.6%) completed three-weeks of monitored substance use abstinence and an affective go/no-go task during fMRI. Analyses were processed and computed within AFNI. A whole-brain multivariate model examined BOLD activation elicited by correct response inhibition to appetitive no-go stimuli compared to go stimuli predicted by past year alcohol use and cannabis use, controlling for cotinine level; and, corrected for multiple corrections using voxel-wise thresholding at $p<.005$ and cluster-wise thresholding at $\alpha=.05$.
Results: In correct happy no-go trials, analyses revealed increased past year alcohol use was significantly associated with decreased BOLD responses in the right hippocampus and amygdala ($p<.005$). Further, increased past year cannabis use was associated with decreased BOLD responses in bilateral cerebellar regions ($p<.005$) and increased BOLD responses in left parietal regions ($p<.005$).
Conclusions: Heavier alcohol and cannabis use in adolescents and young adults was associated with aberrant BOLD activation during correct response inhibition to happy faces. This finding extends upon prior research showing blunted limbic activation in response to negative affective stimuli among alcohol use in this age range. Literature on BOLD responding in cannabis use is consistent with cerebellar findings; however, increased recruitment of parietal region may represent compensation to accurately complete inhibitory control task with appetitive stimuli. Future analyses should seek to understand whether this responding predates or is a result of use.

W131. Prevalence and Correlates of Requiring Assisted Injection Among People Who Inject Drugs in Toronto, Canada

Sanjana Mitra[1], Geoff Bardwell[2], Rick Wang[3], Ruby Sniderman[3], Dan Werb[4], Ayden Scheim[5]*
[1]The University of British Columbia, [2]University of British Columbia, BC Centre on Substance Use, [3]Centre on Drug Policy Evaluation, [4]University of California San Diego, [5]Drexel University

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Epidemiology
Abstract Category Original Research

Aim: Requiring assistance when injecting drugs increases the risk of syringe-sharing, injection-related injury, HIV, and exposure to violence and exploitation. It is also most often reported among vulnerable subgroups of people who inject drugs (PWID), including women and persons with physical disabilities. In light of the need to ensure these particular harms are mitigated, we sought to characterize the socio-structural and drug use correlates of requiring assisted injection among a cohort of PWID in an urban Canadian setting featuring a robust harm reduction continuum of care.
Methods: A cross-sectional baseline survey was administered to PWID in Toronto, Canada from November 2018 to March 2020. Unadjusted and multivariable logistic regression models examined associations with requiring assisted injection in the past six months. A gender-stratified sub-analysis described characteristics of assisted injection among those requiring it.
Results: Of 701 PWID (median [IQR] age, 40 [33 - 49]; 31.0% women), 294 (41.9%) required assisted injection in the past six months. In unadjusted analyses, identifying as a woman (OR: 1.72, 95% CI: 1.24 – 2.39) and being a racialized, non-Indigenous person (OR:1.79, 95% CI: 1.13–2.86) were associated with requiring assisted injection. In multivariable analyses controlling for demographic variables, requiring assisted injection was associated with needing frequent help preparing drugs (AOR: 9.52, 95% CI: 4.78–21.28) and fewer years since first injection (AOR for one-year increase: 0.97, 95% CI: 0.95–0.99). Requiring assisted injection was also associated with injecting heroin/fentanyl once a week or less, and injecting stimulants. Among those requiring assisted injection, women reported needing assistance more often than men (all $p<0.05$).
Conclusions: A high proportion of sampled PWID in Toronto reported requiring assisted injection; this behaviour was associated with greater social vulnerability and specific substance use patterns. These findings highlight the need to provide safer self-injection education and dedicated supervised injection services to accommodate those subgroups requiring assisted injection.

W132. Measuring Retention Within the Adolescent Brain Cognitive Development (ABCD) Study

Sarah Feldstein Ewing[1], Genevieve Dash[2], Andrey Anokhin[3], Norma Castro[4], Linda Chang[5], Linda Cottler[6], Gayathri Dowling[7], Fangzhou Hu[4], Kimberly LeBlanc[7], Chase Reuter[4], Susan Tapert[4], Wesley Thompson[4], Rongguang Yang[4], Robert Zucker[8], Hugh Garavan[9]*
[1]University of Rhode Island, [2]University of Missouri, [3]Washington University, [4]University of California, San Diego, [5]University of Maryland, [6]University of Florida, [7]NIDA/NIH, [8]University of Michigan, [9]University of Vermont

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Lifespan (Infant, Adolescent, Aging)
Abstract Category Original Research

Aim: The Adolescent Brain Cognitive Development (ABCD) study aims to retain a diverse sample of youth and their families across 21 sites throughout its 10-year protocol and minimize selective (systematic) attrition. Sites have made extensive efforts to ensure that participants are supported and engaged.
Methods: To help assess the effectiveness of these efforts, the ABCD Retention Workgroup (RW) uses a data-driven approach to examine, track, and intervene via three key metrics: (1) which youth completed visits late; (2) which youth missed visits; and (3) which youth withdrew from the study. The RW actively examines demographic (race/ethnicity, education level, family income) and site factors to prevent potential disengagement and loss of youth and families.

Results: Race/ethnicity, education level, and family income all predicted late visits. African American and mixed race/ethnicity predicted late visits at 6 months (ORs=2.08 and 1.69, respectively), having less than a postgraduate education predicted late visits at 1 year (ORs=1.69-3.55), and family income of <$50,000/year predicted late visits at 6 and 18 months (ORs=1.41-1.52). Race/ethnicity only predicted missed visits at 30 months, with African American participants more likely to miss (OR=1.96). Having some college education or less predicted missed visits at 6 months, 1 year, and 18 months (ORs=1.9-3.4), and family income of <$50,000/year predicted missed visits at 6 months, 1 year, and 30 months (ORs=1.54-2.5). Neither race/ethnicity, education level, nor family income predicted withdrawal, though participants whose preferred language was Spanish withdrew at higher rates (p=.003). Notably, withdrawal rates were exceedingly low (0.01%).
Conclusions: Racial/ethnic minority participants and those of lower socioeconomic status are those more likely to have late and missed visits. The importance of systematically examining the empirical impact of retention efforts within ABCD is important to ensuring that the study is not missing precisely the over-burdened families whose representation we want to ensure.

W133. Differences in the Relative Contribution of Drug Re-Exposure and Salient Cues in the Reinstatement of Cocaine, Heroin and Nicotine Seeking

Sharon Smith[*1], David Heal[1]*
[1]DevelRx Ltd
Abstract Detail Animal Study
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: Drug-seeking can be reinstated by salient cues associated with abuse, drug re-exposure, or a combination of both. What is less clear are (i) the relative contribution of these triggers to initiating relapse, and (ii) whether their contributions are equal for different abused drugs. Therefore, we investigated reinstatement of drug-seeking for 3 substances with serious abuse liability, nicotine, cocaine and heroin.
Methods: Mildly food-restricted, male, Sprague-Dawley rats were trained to self-administer heroin (0.015mg/kg/inj) or cocaine (0.36mg/kg/inj) on FR5 in 2hr sessions paired with contingent tone+light cues. After stable self-administration (≥12inj/session), the responding was extinguished with saline on FR5 without cues (≤6infusions/session). Reinstatement was initiated by drug priming (cocaine 1mg/kg i.v. or heroin 0.25mg/kg s.c.), presentation of tone/light cues, or drug priming+cues. Nicotine-seeking initiated by nicotine (0.03mg/kg s.c.), tone/light cues or the combination taken from Feltenstein et al (2012, Drug Alc Dep 121; 240-6). Results are mean±SEM [n values].
Results: The effects of contingent cues and drug re-exposure were approximately additive for the reinstatement of cocaine-, heroin- and nicotine-seeking. Drug priming+cues: (active lever-presses: cocaine = 104.4±15.1 [8]; heroin = 166.6±25.7 [11]; both $p<0.001$ vs extinction; nicotine = 47.1±1.3 [33], $p<0.05$). Drug priming alone: cocaine = 59.7±11.8 [9], ($p<0.001$), heroin = 131.2±39.6 [6], ($p<0.01$); nicotine = 17.2±0.2 [33] ($p<0.05$). Tone/light cues alone: cocaine = 60.0±14.9 [10] ($p<0.001$), heroin = 39.3±7.1 [6] (N.S.); nicotine = 29.1±3.7 [33] ($p<0.05$). Although the effects of drug priming and cues were additive, their relative contributions were very different. Heroin: drug re-exposure >> salient cues, cocaine: drug re-exposure ≈ salient cues, and nicotine: drug re-exposure << salient cues.
Conclusions: The findings reveal that drug re-exposure is the most important factor in reinstating heroin-seeking, whereas salient cues are the most important factor in reinstating nicotine seeking. For reinstatement of cocaine-seeking, drug re-exposure and salient cues are equally important.

W134. "I Want to Get Better, But…": A Qualitative Investigation Into the Perceptions and Experiences of People who Inject Drugs With Respect to Hepatitis C Virus Treatment Access

Trevor Goodyear[*1], Helen Brown[2], Annette Browne[2], Peter Hoong[1], Lianping Ti[1], Rod Knight[1]*
[1]British Columbia Centre on Substance Use, [2]School of Nursing, University of British Columbia
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research

Aim: To explore how people who inject drugs (PWID) who have lived experience of hepatitis C virus (HCV) perceive and experience direct-acting antiviral (DAA) HCV treatment access, in a setting with universal coverage of these medications since 2018.
Methods: This qualitative study followed a thematic analysis approach informed by social constructivist grounded theory and a critical theoretical framework. In-depth, semi-structured interviews were conducted between January and June 2018, in Vancouver, Canada, with a stratified purposive sample (n=56) of PWID of diverse genders (46% women, 52% men, 2% Two-Spirit) at various stages of DAA treatment (pre-, peri-, post-treatment).
Results: Data analysis yielded three key themes: (i) life with HCV, (ii) experiences with and perceptions of evolving HCV treatments, and (iii) substance use and the uptake of DAA treatments. First, participants described how health and healthcare conditions, such as the deprioritization of HCV (e.g., due to being asymptomatic, healthcare provider gatekeeping) and catalysts to care (e.g., symptom onset, treatment for co-morbidities) shaped DAA treatment motivation and access. Second, participants described how individual and community-level (i.e., second-hand) accounts of evolving HCV treatments, including skepticism following negative experiences with Interferon-based treatments and uncertainty regarding treatment eligibility, negatively influenced willingness and opportunities to access DAAs. Concurrently, participants described how peer and community endorsement of DAAs was positively associated with treatment uptake. Third, participants welcomed HCV care that was grounded in harm reduction, which included the integration of DAAs with other substance use-related services (e.g., opioid agonist therapy, HIV care). This model of care was valued over abstinence-focused approaches, wherein clinicians framed substance use as a contraindication to HCV treatment eligibility.
Conclusions: These findings underscore several equity-oriented healthcare service delivery and clinician-based adaptations that are required to scale up access to DAAs among PWID living with HCV, including the provision of harm reduction-focused, non-stigmatizing, integrated, person-centred, and peer-led HCV care.

W135. Prevalence of Kratom Use and Its Co-Occurring Substance Use Disorders in the United States, 2019

Kevin Xu[*1], Carrie Mintz[1], Jacob Borodovsky[1], Laura Bierut[1], Richard Grucza[1]*
[1]*Washington University School of Medicine*
Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Other
Abstract Category Original Research
Aim: Kratom is a novel psychoactive substance that is increasingly found in association with illicit drug overdoses. As most kratom-associated overdoses have resulted from its co-consumption with other substances, it is important to understand the comorbid substance use disorders (SUDs) associated with kratom use. This study describes the prevalence of kratom use and its co-occurring SUDs in the US, which is presently not known.
Methods: We used data from the National Survey on Drug Use and Health NSDUH (n=56,136), the first year for which kratom data were available. We calculated prevalence estimates of self-reported history of kratom use, as well as co-occurring past-year opioid, stimulant, tranquilizer/sedative, cannabis, alcohol, and other SUDs. Prevalence ratios were calculated via log-binomial regression. Analyses were done with STATA 16, with all estimates accounting for complex survey design.
Results: The prevalence of lifetime kratom use in the US was 1.5% (95% Confidence Interval [CI]: 1.4-1.6%). Among kratom users, 50.9% (46.8-54.9%) used more than one year ago, 28.4% (24.4-32.8%) used within the past year, and 20.7% (17.2-24.6%) used within the past month. 31% (26.6-35.7%) of users had at least one SUD. Kratom use was associated with increased prevalence of opioid (18-fold, 95% CI: 6.3-12.5%), prescription stimulant (16.5-fold, 9.2-29.5), methamphetamine (12.5-fold, 8.3-18.8), and tranquilizer/sedative (16.8-fold, 9.3-31.1) use disorders. More modest effects were observed for alcohol (3.5-fold, 2.9-4.2) and cannabis (6.6-fold, 4.8-9.0) use disorders. Whereas 7.6% (7.2-8.0%) of never users reported a past-year major depressive episode, this increased to 26.7% (22.7-31.0%) for kratom users.
Conclusions: Nearly one-third of lifetime kratom users have at least one SUD, and over one-fourth experienced past–year major depression. Lifetime kratom use is associated with a markedly elevated risk of other SUDs, especially opioids, stimulants, and sedatives. Our results highlight kratom users as a vulnerable population suffering from significant polysubstance use and in need of targeted interventions.

Virtual Poster Q&A Session III: Stimulants

W136. 4N-Substituted-3,4-Dichlorophenylacetamide-9-(N)-Pyrrolidine-Pyranopiperazine Scaffold: In Vitro and In Vivo Characterization of G-Protein Biased Kappa Opioid Receptor Agonists

Ariel Ben-Ezra[*1], Philip Pikus[1], Michelle Morochnik[1], Brian Reed[1], Mary Jeanne Kreek[1]*
[1]The Rockefeller University

Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Pharmacology
Abstract Category Original Research

Aim: The kappa opioid receptor (KOPr) is a target for the treatment of psychostimulant addiction. The KOPr has two known intracellular signaling pathways, mediated via G-proteins or β-arrestin. We recently showed that in vivo sedative properties of KOPr agonists correlate with in vitro KOPr-mediated β-arrestin-2 signaling, whereas prolactin release, a biomarker of KOPr activation, does not. As such, we have developed a novel KOPr scaffold, 3,4-dichlorophenylacetamide-9-(N)-pyrolidine-pyranopiperazine [PAPPP], for which we aimed to characterize bias both in vitro and in vivo.

Methods: Bias factors for novel KOPr agonists were determined using [35S]GTPγS radioligand binding assays in cell membranes and β-arrestin-2 recruitment in whole cells, using the DiscoverX PathHunter system. In vitro assays utilized KOPr-expressing U2OS cells. Bias factors were in comparison to the balanced KOPr agonist U69,593. Prototype PAPPP, which has no amine substituent, was tested in adult male C57BL6 mice. For the prolactin assay, mice housed in stress-minimized conditions were injected with PAPPP (or vehicle: 10%ethanol, 10%Tween-80, 80%water) and serum prolactin levels were determined 30 minutes later. Additionally, following rotarod training, animals were injected with PAPPP or vehicle, and tested at 0, 30, and 60 minutes.

Results: Diverse compounds based on the PAPPP scaffold are significantly G-protein biased versus β-arrestin-2, despite varied substituents. Both isomers of PAPPP yielded significant prolactin release at 10mg/kg. However, in the rotarod assay, one PAPPP isomer showed significant sedation only at a very high dose (90mg/kg), whereas the other isomer showed no significant rotarod incoordination at any dose.

Conclusions: N-substituted-PAPPP compounds largely exhibit G-protein signaling bias. Additionally, unsubstituted PAPPP KOR-mediated effects in vivo are consistent with G-protein bias, with very low potency in producing rotarod incoordination/sedation in comparison to prolactin stimulation. Further characterization of this scaffold in animal models of addiction is warranted.

W137. Factors Associated With Post One-Year Illicit Drug Use Among Persons on Probation in the Japanese Criminal Justice system: A Prospective Cohort Study

Ayumi Takano[*1], Eriko Ban[2], Takashi Usami[2], Yuka Kanazawa[2], Yousuke Kumakura[3], Toshihiko Matsumoto[2]*
[1]Tokyo Medical and Dental University, [2]National Institute of Mental Health, National Center of Neurology and Psychiatry, [3]The University of Tokyo

Abstract Detail Human
Select Drug Category Stimulants
Topic Criminal Justice
Abstract Category Original Research

Aim: A high recidivism rate among methamphetamine users is a concern. This study aimed at exploring factors associated with illicit drug use among people on probation in the Japanese criminal justice system.

Methods: We used data regarding persons on probation due to methamphetamine use in a multicentered prospective cohort study in Japan, called the “Voice Bridges Project”. The participants were recruited at the probation office and referred to public mental health care centers. The data collection was conducted by healthcare workers at public mental health care centers. We selected participants who completed the one-year follow-up survey (N=173). The dependent variable was illicit drug use between the baseline and one-year follow-up survey. Multivariable logistic regression was performed to assess the association between illicit drug use and potential predictors, such as sociodemographic variables, the severity of drug use, and the use of welfare or treatment services. This study was approved by the Institutional Review Board of the National Center of Neurology and Psychiatry.

Results: Among the participants, 11 (6.4%) gave a positive response for any illicit drug use. After adjusting for sociodemographic variables and the severity of drug use, the use of welfare services was positively associated

with illicit drug use (OR: 7.01, 95% CI: 1.32-37.29, p=0.02). The existence of persons who the participants can talk openly with was negatively associated with illicit drug use (OR: 0.16, 95% CI: 0.03-0.85, p=0.03).
Conclusions: This study suggested that people with social vulnerability are likely to use illicit drugs again. We should not only provide treatment for drug dependence but also prevent social isolation among drug offenders.

W138. Renewal of Cocaine Seeking Using Social and Nonsocial Contexts

Bree Humburg[1], Lindsey Hammerslag[1], Samantha Malone[1], Michael Bardo[1]*
[1]*University of Kentucky*
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavior
Abstract Category Original Research
Aim: Individuals with substance use disorder undergo craving when re-exposed to a drug-associated context. The purpose of this study was to determine if renewal of cocaine seeking is differentially controlled using a context consisting of either social and/or nonsocial stimuli.
Methods: Adult Sprague-Dawley (7 male and 8 female) rats were trained with a 2-lever procedure to self-administer cocaine for 21 days in a context consisting of both a same-sex peer and illumination of a house light (Context A). Half the rats were then extinguished in Context A and the other half were extinguished in Context B (no peer or house light). Renewal of cocaine seeking was then tested in the presence of Context A stimuli as follows: (1) peer alone; (2) house light alone; or (3) peer + house light compound. Multi-level modeling was used to analyze differences in responding between AAA and ABA groups during renewal tests.
Results: Following acquisition of cocaine self-administration, extinction was more complete in the AAA group compared to the ABA group. There was a significant log(session)*group interaction (change = -0.61, $p < .0001$), with the decay in log(active) responding being greater for the AAA group than the ABA group (change = -0.36, $p < .001$); difference in change = 0.22, $p < .05$. During renewal tests, the ABA group showed significant renewal to the peer alone (mean difference from extinction = 24.14, $p < .001$) and peer + house light compound (mean difference from extinction = 21.29, $p < .05$), whereas the AAA group did not. The house light alone did not renew cocaine seeking in either group.
Conclusions: These results indicate that social peers can serve as powerful stimuli that can overshadow inanimate stimuli in renewal of drug seeking.

W139. Demand and Cross-Price Elasticity of Cocaine and Social Contact

Jessica Sharp[1], Justin Strickland[2], Hannah Cha[1], Mark Smith[1]*
[1]*Davidson College,* [2]*Johns Hopkins University School of Medicine*
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Economics
Abstract Category Original Research
Aim: Drug addiction is characterized, in part, by the pathological choice of drugs over other reinforcers. Concurrent choice procedures are used to model pathological choice in laboratory animals. This study used a behavioral economic approach to examine demand and cross-price elasticity (i.e., sensitivity of consumption to the unit price of an alternative reinforcer) of cocaine and social contact.
Methods: Male rats responded under a concurrent schedule of reinforcement in which the two reinforcers were cocaine (0.5 mg/kg, iv) and 30-s access to a social partner. The two schedules operated independently, meaning that behavior could be reinforced for one alternative (e.g., cocaine) during engagement with the other alternative (e.g., during the 30-s social access period). The fixed ratio value (i.e., unit price) of both reinforcers varied across sessions, and economic analyses determined demand intensity (consumption at unconstrained price) and demand elasticity (price sensitivity) of each reinforcer under conditions in which the alternative was or was not concurrently available. Cross-price elasticity was determined by the slope of consumption for the concurrently available, fixed-price reinforcer.
Results: Concurrent social access nonsignificantly reduced cocaine demand intensity but did not alter cocaine demand elasticity. Concurrent cocaine access significantly decreased social demand intensity and significantly increased social demand elasticity. Cross-price elasticities indicated a weak positive slope for cocaine and a modest positive slope for social access.

Conclusions: Cross-reinforcer demand procedures suggest that social contact can serve as a weak substitute for cocaine, whereas access to cocaine can serve as a strong substitute for social contact.

W140. Moderating Effect of Illicit Drug Use on the Relationship Between Sexual Behaviours and Prevalence of HIV or Sexually Transmitted Infections

Lian-Yu Chen[*1], Shang-Chi Wu[2], Nai-Ying Ko[3]*
[1]Taipei City Hospital, [2]National Taiwan University, [3]National Cheng Kung University
Abstract Detail Human
Select Drug Category Stimulants
Topic Comorbidities
Abstract Category Original Research
Aim: We aimed to: (i) investigate sexual behaviours, substance use, HIV and sexually transmitted infections (STI) prevalence among a population of men who have sex with men (MSM) in Taiwan; and (ii) examine the moderating effects of substance use in the relationship of sexual behaviours and HIV and STI diagnosis.
Methods: We used the Taiwan 2013 Internet MSM Sex Survey conducted cross-sectionally online. We examined the association between sexual behaviours and HIV and STIs using logistic regression models. We then assessed the moderating effects of substance use between specific sexual behaviours and HIV and STI using interaction term.
Results: Among the 2020 MSM participants, 5.5% of them had reported having been diagnosed with HIV and 7.4% with STIs. Reporting having a sex partner found online, having unprotected anal sex with a casual male partner, alcohol and illicit drug use were all significantly associated with HIV and STI diagnosis. Those reporting having sex with partners found via mobile apps were more likely to report being HIV positive as a function of illicit drug use. A similar finding was evident for STIs. Interestingly, alcohol had no moderating effects in similar analyses.
Conclusions: This study sheds light on future development of interventions that target at mobile apps which better integrate drug prevention and HIV prevention programs for the MSM population.

W141. Stress and Agitation in Meth-Using Individuals in a Simulated Emergency Department Setting

Michael Wilson[*1], Manny Alvarez-Romero[1], Ashley Acheson[1], WB Gentry[1], Michael Mancino[1], Austin Porter[1], Steve Shoptaw[2], Alison Oliveto[1]*
[1]University of Arkansas for Medical Sciences, [2]University of California, Los Angeles
Abstract Detail Human
Select Drug Category Stimulants
Topic Behavior
Abstract Category Original Research
Aim: Stress and agitation (severe behavioral arousal) is frequent among methamphetamine (meth) users in the emergency department (ED). Although behavioral arousal is frequent in the ED, limited studies have suggested dysregulated stress responses among meth-using individuals in traditional lab studies. Thus, the aims of this project were to assess both traditional stress responses (vital signs, cortisol, alpha-amylase) and clinical agitation scores (BARS, PANSS-EC) in meth-using individuals in a simulated ED.
Methods: Meth-using volunteers (aged 18–55) were randomized either to a standard social stressor task or an ED-relevant stressor task in which participants described their most stressful ED visit, plus mental arithmetic, in front of both a video camera and an experimenter. Standard speeches were adapted from Lovallo, while ED-relevant speeches of the same length were prepared similar to Sinha's imagery scripts in order to standardize stressfulness. Stress conditions were compared to a separate control day consisting of nature videos. Vital signs were collected at baseline after a 30-minute relaxation period and every 4.5 minutes thereafter, while cortisol/alpha-amylase were collected at baseline and 3 times thereafter. Given the preliminary results, data are presented descriptively as an average change from baseline during stress and control conditions, respectively.
Results: Recruitment is ongoing. Thus far, 3 participants undergoing the ED-relevant task have completed both sessions and one individual has completed the first lab session. Preliminary results indicate that heart rate (+3±3.4 vs -2.5±3.6), systolic blood pressure (1.7±3.2 vs -1.4±2.5), and agitation scores (BARS: 4.3±0.5 vs 3.6±0.6; PANSS-EC: 8.4±3.2 vs 6.3±1.6) are greater during stress compared to the control. Cortisol/alpha-amylase concentrations are currently being analyzed.

Conclusions: These preliminary results suggest that an ED-relevant stressor task may produce measurable stress responses in vital signs and behavior among meth-using individuals in an ED setting.

W142. Behavioral Effects of Four Synthetic Cathinones in Male Rodents

Ritu Shetty[1], Adam Hoch[1], Nathalie Sumien[1], Michael Forster[1], Michael Gatch[1]*
[1]*University of North Texas Health Science Center*
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: There has been a rampant increase in sales of designer drugs that are being used as substitutes for older illegal psychostimulants. However, the pharmacological activity of these drugs is either unknown or understudied. The purpose of these studies was to evaluate four synthetic cathinones for their ability to stimulate locomotor activity (LMA) and to test for substitution for cocaine or methamphetamine in a drug discrimination (DD) assay and determine the potency and efficacy of these compounds relative to commonly abused psychostimulants.
Methods: 3,4-Methylenedioxy-alpha-pyrrolidinohexanophenone (3,4-MD-α-PHP), 4-chloro-α-pyrrolidinopropiophenone (4-Cl-α-PPP), alpha-pyrrolidinohexiophenone (α-PiHP) and 4-chloro-pentedrone (4-CPD) were tested for their ability to stimulate LMA in male Swiss-Webster mice. The discriminative stimulus effects of these cathinones were assessed in male Sprague-Dawley rats that were trained to discriminate cocaine (10 mg/kg) or methamphetamine (1 mg/kg) from saline.
Results: Locomotor stimulant effects of 3,4-MD-alpha-PHP (ED50=1.7 mg/kg), α-PiHP (ED50=2.8 mg/kg), and 4-Cl-α PPP (ED50= 6.5 mg/kg) were observed within 10 min following injection and lasted from 2 to 3.5 h. The stimulant action of 4-CPD (ED50=17.3 mg/kg) was delayed, occurring 40-70 min following injection. The maximal motor stimulant actions of 3,4-MD-α-PHP and α-PiHP were equivalent to that of cocaine and methamphetamine, whereas 4-CPD (50%of cocaine) and 4-Cl-α-PPP (73%of cocaine) were less efficacious. 3,4-MD-α-PHP and α-PiHP fully substituted for the discriminative stimulus effects of cocaine and methamphetamine in rats. In contrast, 4-CPD fully substituted for the discriminative stimulus effects by cocaine, but only partially substituted for methamphetamine. While 4-Cl-α-PPP fully substituted for the discriminative stimulus effects of cocaine, its effects to discriminate methamphetamine is yet to be determined.
Conclusions: The behavioral pharmacology profiles of tested compounds provided confirmation of their potential abuse use as legal substitutes for cocaine. However, 3,4-MD-α-PHP and α-PiHP had a rapid onset similar to cocaine and were more potent and efficacious as stimulants when compared with 4-CPD and 4-CL-α-PPP.

W143. Effects of Food Restriction on the Conditioned Reinforcing Properties of a Cocaine-Associated Stimulus

Stephen Robertson[1], Emily Jutkiewicz[1]*
[1]*University of Michigan*
Abstract Detail Animal Study
Select Drug Category Stimulants
Topic Behavioral Pharmacology
Abstract Category Original Research
Aim: We have previously demonstrated that cocaine-associated stimuli take on conditioned reinforcing properties dose-dependently, such that a stimulus paired with 100 mcg/kg/inf of cocaine does not engender a stimulus paired with cocaine deliveries with conditioned reinforcing properties, whereas a stimulus paired with 320 or 560 mc/kg/inf of cocaine produced conditioned reinforcing properties. Because food restriction enhances the primary reinforcing properties of drugs of abuse, we extended this line of inquiry to characterize the extent to which food restriction (20 g/day vs. free-fed) enhanced the conditioned reinforcing properties of a cocaine-associated stimuli.
Methods: First, male rats (n = 8/group) underwent 10 Pavlovian conditioning sessions in which they received 10 cocaine deliveries (320 mcg/kg/inf) and 10 stimulus presentations according to a variable time 15 min schedule. For the experimental group, rats received the cocaine deliveries and stimulus presentations together. For the control group, the cocaine deliveries and stimulus presentations occurred according to two separate clocks. Next, we tested the extent to which the cocaine-associated stimulus functioned as a conditioned reinforcer across 14 days by allowing rats to freely emit nosepoke responses that resulted in the presentation of the cocaine-associated stimulus alone. We quantified the conditioned reinforcing properties of the stimulus by computing a Preference

Score (Active – Inactive Responses) for each day for each rat and analyzed Preference score using a mixed ANOVA.
Results: We found that preference scores were highest for animals that were food restricted, regardless of conditioning, and tended to decrease across days of testing, which was supported by an interaction between day of testing and feeding condition ($p < 0.01$), main effect of day of testing ($p < 0.001$), and a main effect of feeding condition ($p = 0.03$).
Conclusions: Food restriction resulted in higher preference scores than free-fed animals, regardless of conditioning history.

W144. Human Cognitive Performance During Laboratory Administration of Cocaine: Self-Administration Versus Experimenter-Administration

Nehal Vadhan[1], Sean Madden[1], Stephanie Reed[2], Susanne Vosburg[2], Richard Foltin[2]*
[1]Northwell Health, [2]Columbia University Medical Center
Abstract Detail Human
Select Drug Category Stimulants
Topic Behavior
Abstract Category Original Research
Aim: Research suggests that greater severity of naturalistic cocaine use is associated with cognitive deficits in human studies, and that in rodent studies, self-administered cocaine produces smaller cognitive effects than experimenter-administered cocaine. In the current study, we compared changes in cognition as a function of laboratory cocaine administration method.
Methods: Twelve physically/psychiatrically healthy adult cocaine users participated in either a self-administration (SA) protocol (n=5), with the option to smoke cocaine or receive a probabilistic monetary reinforcer, or an experimenter-administration (EA) protocol (n=7), with no explicit choice/alternative reinforcer. In both protocols, cocaine (12 opportunities of 25 mg each) was available (Binge 1), withheld (Abstinence) and then available again (Binge 2), and cognition was assessed daily. Each phase consisted of up to 5 days, . Each protocol was similar in participant demographic/cocaine use characteristics ($p>0.05$), but dissimilar on the # of cocaine doses taken experimentally (EA>SA; $p>0.05$). The first 2 days of cognitive performance from each phase were considered, and Binge phased were compared to the Abstinence phase via mixed repeated measures ANOVAs
Results: There were significant interactions ($p<0.05$) between protocol type and phase/day for the Digit Recall Task (number correct) and the Divided Attention Task (DAT false alarms), ($p<0.05$). With total cocaine doses taken as a covariate, there were significant interactions ($p<0.05$) between protocol type and phase/day for the Digit Symbol Substitution Test (percent correct), Repeated Acquisition Task (sequences completed), and DAT false alarms. For these interactions, performance was better: 1) during Abstinence relative to the Binges, and 2) for participants in the SA relative to the EA protocol.
Conclusions: As hypothesized, experimenter-, relative to self-administered-, cocaine binges were associated with greater cognitive decrements in cocaine users.

W145. Methamphetamine-Associated Psychosis and Schizophrenia: A Descriptive and Comparative Case Series

Suzaily Wahab[1], Nurul Syuhaida Abdul Razak[1], Hatta Sidi[1], Norliza Chemi[2], Norfazilah Ahmad[1]*
[1]University Kebangsaan Malaysia Medical Centre, [2]Kajang Hospital, Malaysia
Abstract Detail Human
Select Drug Category Stimulants
Topic Disparities
Abstract Category Original Research
Aim: Methamphetamine is an illicit psychostimulant that can induce psychotic symptoms as similarly seen in schizophrenia. During an acute episode, the symptoms presented in methamphetamine-associated psychosis (MAP) can be very difficult to differentiate from schizophrenia, making an accurate diagnosis challenging. This study aimed to determine the differences between the demographic, clinical characteristics, and psychopathology among patients diagnosed with MAP and schizophrenia.
Methods: A comparative case series was conducted at psychiatric inpatient and emergency settings in a tertiary hospital involving 130 patients with MAP and 150 schizophrenia patients, both males and females included. The

MINI International Neuropsychiatric Interview version 6.0 and the Positive and Negative Symptoms Scale (PANSS) were used as instruments.
Results: Of the 280 patients screened on admission, 72.3% (94/130) MAP and 71.3% (107/150) schizophrenia patients were eligible for this study. For the positive symptoms scale, the mean score of PANSS P3: hallucinatory for MAP patients [4.29 (1.56)] was significantly lower than schizophrenia patients [5.91 (1.01)] ($p<0.001$). For the negative symptoms scale, the mean scores of two items; PANNS N6: Lack of flow and spontaneity and PANSS N7: Stereotyped thinking [1.95 (1.31) and 1.15 (0.44), respectively] were significantly lower among MAP patients compared to schizophrenia patients [3.22 (1.84) and 1.85 (1.32), respectively] ($p<0.001$). For the general psychopathology scale, eight items were significantly lower in MAP patients in comparison to schizophrenia patients. The items were i) PANSS G1: somatic ($p<0.001$), ii) PANSS G5: mannerism and posturing ($p<0.001$), iii) PANSS G6: depression ($p<0.001$), iv) PANSS G7: motor retardation ($p<0.001$), v) PANSS G8: uncooperativeness ($p=0.002$), vi) PANSS G10: disorientation ($p<0.001$), vii) PANSS G13: Disturbance of volition ($p<0.001$) and viii) PANSS G15: Preoccupation ($p<0.001$).
Conclusions: There were variations between the demographic, clinical and symptomatology of MAP and schizophrenia. Identifying the variables can assist in determining the diagnosis and formulating the best management plan for the disorders.

W146. Rates of Non-Fatal Stimulant Overdose and Overdose-Related Healthcare Utilization Among Women With Unstable Housing

Thibaut Davy-Mendez[*1], Eric Vittinghoff[1], Samantha Dilworth[1], Leslie Suen[2], Carl Braun[3], Phillip Coffin[4], Derek Satre[1], Elise Riley[1]*
[1]University of California, San Francisco, [2]UCSF and San Francisco VA Medical Center, [3]University of California, San Francisco, [4]UCSF and San Francisco Department of Public Health
Abstract Detail Human
Select Drug Category Stimulants
Topic Harm Reduction
Abstract Category Original Research
Aim: Given recent increases in mortality from stimulant overdose (OD) and in stimulant-opioid co-use in the US, we sought to evaluate the burden of non-fatal stimulant OD and the extent to which these receive medical care among women who use stimulants.
Methods: In San Francisco, California, we followed homeless or unstably housed women monthly for up to six months in 2016-2019. At each visit, participants were administered questionnaires on drug use, drug toxicity symptoms, stimulant OD ("over-amping"), and healthcare utilization including reason (OD of any substance vs. not OD-related). Among women reporting prior-year stimulant use at baseline, we used Poisson regression with GEE to estimate incidence rates of stimulant OD, emergency department (ED) visit, and hospitalization.
Results: The 143 eligible women (621 person-months) were 41% Black, 24% White, 15% Latina, and a median of 55 years old. Lifetime stimulant use included crack cocaine (95%), powdered cocaine (80%), and methamphetamines (53%). Fifty-seven percent reported lifetime heroin use. There were 62 non-fatal stimulant ODs during follow-up, a rate of 120.0 per 100 person-years (95% CI 80.9-159.1). Of 27 study visits reporting stimulant OD in the past week, the most frequently reported symptoms were tachycardia (70%), extreme anxiety (70%), difficult or irregular breathing (67%), and paranoia (67%). ED visit rates per 100 person-years were 251.2 (95% CI 194.2-308.3) overall and 15.5 (95% CI 3.7-27.2) for OD-related visits. Hospitalization rates per 100 person-years were 104.4 (95% CI 69.0-139.7) overall and 9.7 (95% CI 0.0-19.6) for OD-related admissions.
Conclusions: Women in this sample had high rates of non-fatal stimulant OD but comparatively low rates of healthcare utilization for OD of any substance, indicating few sought medical care when experiencing stimulant OD. Women had high rates of all-cause healthcare utilization, which may present opportunities for harm reduction efforts to prevent OD of stimulants or jointly used substances such as opioids.

W147. The Effectiveness of Daily Text Messaging to Support Adherence to HIV Pre-Exposure Prophylaxis (PrEP) Among Meth-Using Men who Have Sex With Men

Vanessa Serrano[*1], David Moore[1], Sheldon Morris[1], Jessica Montoya[1]*
[1]University of California, San Diego
Abstract Detail Human
Select Drug Category Stimulants

Topic Technology (e.g., mHealth)
Abstract Category Original Research
Aim: Methamphetamine (METH) use is a risk factor for HIV transmission among men who have sex with men (MSM). With high levels of adherence, tenofovir disoproxil fumarate/emtricitabine (FTC) as PrEP reduces the risk of HIV transmission. The Individualized Texting for Adherence Building (iTAB) intervention was designed to support PrEP adherence. We evaluated the effectiveness of iTAB for PrEP adherence as compared to standard of care (SoC) among METH-using MSM.
Methods: We examined a group of METH-using MSM (n=60) who participated in the California Collaborative Treatment Group 595 study, a randomized control trial conducted across four Southern California medical centers between 2013 and 2016. Participants were randomized 1:1 to iTAB versus SoC. Plasma FTC was examined at weeks 12 and 48 to characterize PrEP adherence: nonadherence (TFV-DP levels <719 fmol/punch), adequate adherence (TFV-DP levels 719-1245 fmol/punch), and near-perfect adherence (TFV-DP levels ≥1246 fmol/punch). METH use in the past three months was self-reported using a substance use questionnaire. Likelihood ratio chi-squared tests were used to examine differences in adherence by study arm.
Results: Among the METH-using participants, 24 were assigned to iTAB and 36 to SoC. At week 12 there was no difference in proportion of METH-using participants with near-perfect adherence by study arm: iTAB (45%) vs SoC (45%; p=1.0). Participants had similar loss to follow-up in the two study arms (iTAB lost, n=8, SoC lost, n=10, p=0.77). At week 48, proportion of participants achieving near-perfect adherence was higher in the iTAB (62.5%) vs. SoC group [26.9%; X2 (2, N=42)=7, p<.03].
Conclusions: The proportion of METH-using participants achieving near-perfect adherence at week 48 in the iTAB group was more than double the proportion in the SoC group. These results indicate that iTAB supports durability of PrEP adherence. Future directions include a larger study of iTAB to support PrEP adherence among METH-using MSM.

W148. Associations Amongst Form of Cocaine Used (Powder Vs Crack Vs Both) and HIV-Related Outcomes

Yiyang Liu[*1], Veronica Richards[1], Nioud Gebru[1], Emma Spencer[2], Robert Cook[1]*
[1]University of Florida, [2]Florida Department of Health
Abstract Detail Human
Select Drug Category Stimulants
Topic Infectious Disease (e.g., HIV, HCV)
Abstract Category Original Research
Aim: Cocaine (including powder and crack) use is common among people with HIV (PWH). We identified factors associated with cocaine use and forms of cocaine used among PWH; examined differences in HIV treatment outcomes across groups.
Methods: The study sample (n=1,166) derived from two cohorts of PWH in Florida between 2014–2020. Baseline data linked to the Enhanced HIV/AIDS Reporting System (eHARS) tracked viral load. Comparative analyses were conducted by cocaine use (users n=257 vs. non-users n=909) and by forms of cocaine used (powder only n=101, crack only n=91, and both n=65). Logistic regression examined the association between the three cocaine use groups and viral suppression (<200 copies/mL) in the following year.
Results: Cocaine users have lower HIV treatment adherence and viral suppression than non-users. People who used powder cocaine only were more likely to be younger, Hispanic/Latinx, and employed than those who used crack only or both; those who used both were more likely to use other illicit substances than those who used either form only. Referenced to people who used both powder and crack cocaine, those used either form only were 3+ times as likely to have durable viral suppression in the following year independent of the frequency of cocaine use and polysubstance use.
Conclusions: The dual use of both powder and crack cocaine prospectively predicts a decrease in viral suppression in the following year. Screening for the use of powder and crack cocaine can identify high-risk populations that would benefit from interventions to improve future viral suppression.

W149. Protocol to Assess the Feasibility, Efficacy, and Safety of Extended Release Injectable Buprenorphine for the Treatment of Opioid Use Disorder Among Individuals at High Risk of Overdose

Seonaid Nolan[*1], Farah Saab[2], Tatiana Kawakami[2], M. Eugenia Socias[1]*

[1]University of British Columbia, [2]BC Centre on Substance Use
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Program Descriptions
Aim: Opioid related morbidity and mortality have resulted in one of the worst public health crises in North America. History of overdose (OD) is correlated with an increased risk of a future fatal OD. An urgent need exists to develop effective interventions for this high-risk population. SublocadeTM is a buprenorphine extended-release (XR-BUP) monthly subcutaneous injection product approved by Health Canada, which potentially provides an expansion of treatment options for opioid use disorder (OUD), particularly in individuals with difficulties adhering to a daily medication regimen. Current research shows that XR-BUP is effective for treatment retention and in reducing illicit opioid use as compared to placebo. The protocol described here aims to assess the use of this innovative treatment option in a Canadian setting and among individuals at high risk for OD.
Methods (Optional): The open label, single arm, 24-week study will assess the feasibility, safety and efficacy of XR-BUP for treatment of OUD among individuals at increased risk for OD (defined as having experienced a non-fatal OD within the preceding 6 months). The study aims to recruit 40 adults from St. Paul's Hospital's Rapid Access Addiction Clinic in Vancouver, Canada. The primary outcome is retention on XR-BUP. Secondary outcomes include safety, illicit opioid use, opioid cravings, OD events, treatment satisfaction, changes in drug related problems, quality of life, health service utilization and criminal activity. Intention to treat and per protocol analyses will be conducted.
Conclusions: Data generated from this study will apprise the feasibility and safety of using XR-BUP as a treatment for individuals with OUD at increased risk of OD. Knowledge generated from this work will inform the development of a larger clinical trial evaluating XR-BUP in a Canadian setting.

W150. MATPharm: A Collaborative Care Model for Addiction Treatment in Pharmacies

Traci Green[*1], Jeffrey Bratberg[2]*
[1]Boston University School of Medicine, [2]University of Rhode Island
Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Treatment
Abstract Category Original Research
Aim: Even as opioid overdoses increase, the demand for medications for addiction treatment (MAT) vastly exceeds availability. This pilot study determined the feasibility of providing pharmacy-based MAT care to 11 patients with opioid use disorder, and to consider adaptations of this model to increase MAT access during COVID-19.
Methods: In Rhode Island, a pharmacist collaborative practice agreement (CPA) for MAT care was adapted from an existing nurse case manager office-based model. Once approved by state officials, we trained 17 pharmacists in MAT care provision principles using a customized 20-hour online and in-person course adapted from national curricula. We enrolled 11 patients receiving buprenorphine maintenance doses who visited the study pharmacy at least weekly for one month. Study assessments were in-person and included self-reported behavioral measures of drug use, safety, and social and health stability and clinical measures such as drug toxicology, counseling, and pharmacy visit attendance. Feasibility was assessed from patients as well as from pharmacists delivering the intervention through a self-reported Likert-scale item. During the COVID-19 crisis, state and community concerns for broader MAT care brought about further approved CPA adaptations.
Results: Eleven patients (45% women, 40% non-white race) aged 23 to 60 years completed 70 clinic visits at two locations. Patients with mandated counseling and other requirements continued outside the pharmacy. All pharmacists rated the CPA model feasible; patients rated the care receipt highly. Patients noted efficient care, flexibility, family-friendly setting, and low perceived stigma of the pharmacy experience. During COVID-19, changes in permissions from DEA/SAMHSA led to expanding the CPA to support withdrawal care management and pharmacist-facilitated induction.
Conclusions: Findings suggest that a MAT CPA care model is feasible and safe for patients and pharmacists. This model proves the value of pharmacists as part of the OUD patient care team to meet the dynamic needs of patients in the COVID-19 pandemic.

W151. Empowering Pharmacists to Preserve and Expand Access to Medications for Opioid Use Disorder Beyond the COVID-19 Pandemic

Jeffrey Bratberg[*1], Traci Green[2], Daniel Ventricelli[3]*
[1]University of Rhode Island, [2]Boston University School of Medicine, [3]Philadelphia College of Pharmacy

Abstract Detail Human
Select Drug Category Opiates/Opioids
Topic Policy
Abstract Category Theoretical/Commentary

Aim: The COVID-19 pandemic and its economic, social, and emotional consequences have exacerbated the opioid crisis. Rising overdose rates and decreasing access to treatment have highlighted the inequities in buprenorphine and methadone access for opioid use disorder (MOUD). MOUD saves lives, but rural, Black, and lower socioeconomic status patients have historically had limited access to buprenorphine and methadone. Pharmacies are located within 5 miles of 90% of every American. Pharmacist-based solutions are urgently needed to be implemented to sustain and expand access for these vulnerable groups.

Methods (Optional): Methadone is limited to opioid treatment programs (OTP) and while permitted to be dispensed from community pharmacies for treating pain, Drug Enforcement Administration (DEA) regulations do not permit dispensing for OUD treatment. This particularly affects rural patients who travel long distances, often daily, to OTPs instead of more convenient and accessible pharmacies, common in other countries. Pharmacies must be able to dispense methadone for OUD. Buprenorphine, though accessible through pharmacies, is over-regulated through training and waiver requirements, patient limits, community pharmacy dispensing challenges, and widespread stigma and misinformation among patients, prescribers, and pharmacists. The DEA requirement for wholesalers to detect and report suspicious orders of all opioids have led pharmacists to unnecessarily limit buprenorphine dispensing. Removing buprenorphine from this requirement will encourage pharmacists to dispense without fear of DEA investigation. Patients must be able to initiate this medication through an authorized, willing, and known provider. Since the COVID-19 pandemic began in March 2020, buprenorphine can be initiated without an in-person assessment over an audio-only connection, lowering barriers for people to start treatment. In Rhode Island, these changes permitted an IRB-approved study to allow pharmacies to enroll patients and start home inductions performed using a collaborative practice agreement (CPA). These changes must be made permanent to maintain access using this tool. Recognizing and equitably reimbursing pharmacists to provide addiction pharmacotherapy services would further maintain low-barrier access to these essential medications and care.

Conclusions: A lack of trust, stigma, and fear of regulatory oversight hinders both patient access to MOUD and collaborative efforts among healthcare professionals to manage patients with OUD. The delivery of effective pharmacotherapy for patients struggling with OUD requires collaborative working relationships between physicians and community pharmacists, permanent changes to onerous federal regulations, and recognition of pharmacists as providers of addiction care.

W152. Injecting Drug Use Among Street Homeless in Northern Ireland: Impact of COVID on Supply Access and Service Provision

Anne Campbell[*1], Kathryn Higgins[1]*
[1]Queens University Belfast

Abstract Detail Human
Select Drug Category Polydrug (i.e. Use of more than one drug combination)
Topic Harm Reduction
Abstract Category Original Research

Aim: The Extern Street Injectors service (SISS) (Northern Ireland) is a harm reduction project, which works with rough sleepers and ‘other’ homeless persons who have complex drug and alcohol problems. Since the onset of the lock down on March 16, 2020, the project moved to a seven-day week, working 12-hour shifts. These shifts are conducted by worker dyads (primarily comprised of social work trained individuals) who spend their time giving harm reduction advice, checking hostel eligibility, and administering Naloxone in overdose situations on the streets. Research Aims: To examine the drug using behaviours/patterns of drug use of street homeless over the initial lockdown period in 2020. To gauge the perceptions of service users and workers as regards SISS during the COVID Pandemic.

Methods: The research team conducted a secondary analysis of records between March 1, 2020, and September 30, 2020 compared with records from the same period during the previous year. Furthermore, we conducted focus groups with the eight staff and interviews with eighteen current service users. Data from the EXTERN Needle exchange database was inputted into a SPSS database. Tests of association explored relationships between a number of variables, including demographics, needle finds and naloxone administration for OD. Data from interviews with participants were analysed using the principles of thematic content analysis (Burnard, 1991).
Results: Data highlights in April 2020 that there were 601 needle finds. However, the team identified a decline in needle finds in May 2020 as the outreach team a reduction of 27%. During the pandemic, SISS workers identified a 22% rise in young injectors who have very little experience of injecting drug use, and all were initiated into groin injecting on first time IV usage. Their limited experience led to particular issues, including infections, abscesses and inadvertently hitting nerves whilst injecting. A number of service users highlighted how important harm reduction advice is to people who inject drugs on the street.
Conclusions: The results from the study will be important to understand the impact of the COVID situation on the drug using behaviour of vulnerable people who are homeless and who have complex drug and alcohol problems.

Monday, June 21, 2021

2:00 p.m. - 3:00 p.m.

1. Symposium: Behavioral Endophenotypes for Substance Use Disorders

Chair: Jermaine Jones, Columbia University Irving Medical Center

Abstract: Drug addiction is a complex neuropsychiatric disorder with significant variation in symptom expression, severity, course, age of onset, and rate of progression. The heterogeneous nature of this disorder makes it difficult to describe, discriminate, and predict the nature and course of substance use disorders (SUDs). An endophenotype is a measurable component along the pathway between genotype and disease that confers vulnerability. Endophenotypes are biomarkers that may be neurophysiological, biochemical, cognitive, neuropsychological, or behavioral, and are based on the idea that complex psychiatric diagnoses can be deconstructed. This symposium will review various methods being used to identify novel candidate behavioral endophenotypes of SUDs. First, Dr. Steven Nieto will discuss the use of a phenotype battery of well-validated scales and behavioral measures to identify core constructs in problem drinkers. Dr. Vassileva will discuss her work using computational modeling as a novel phenotyping tool for substance use disorders. Dr. Jones will discuss finding on the relationship between the trait anxiety sensitivity and the subjective response to oxycodone, alcohol, and methamphetamine in the clinical laboratory. Finally, Dr. Iacono will discuss using endophenotypes to identify psychophysiological mechanisms associated with polygenic risk scores. We hope that this seminar will provide an understanding of the potentially significant contribution of endophenotype discovery to our understanding of the mechanisms underlying SUDs, and in the development of biologically based nosologies across drug classes.

1.1 Behavioral Endophenotypes for Substance Use Disorders

Suky Martinez, Columbia University & New York State Psychiatric Institute

1.2 Evaluation of the Addictions Neuroclinical Assessment (ANA) Framework Through Deep Phenotyping of Problem Drinkers

Steven Nieto, University of California, Los Angeles

1.3 Utility of Computational Modeling as a Novel Phenotyping Tool for Substance Use Disorders

Jasmin Vassileva, Virginia Commonwealth University, School of Medicine

1.4 Relationship Between Anxiety Sensitivity and the Positive Subjective Effects of Opioids, Alcohol, and Psychostimulants Assessed Under Controlled, Clinical Laboratory Conditions

Jermaine Jones, Columbia University Irving Medical Center

1.5 Using Endophenotypes to Identify Psychophysiological Mechanisms Associated With Polygenic Scores for Substance Use

Jeremy Harper, University of Minnesota

1.6 Behavioral Endophenotypes for Substance Use Disorders

Lara Ray, University of California Los Angeles

2:00 p.m. - 3:00 p.m.

2. Workshop: Vapor Inhalation Models of Drug Self-Administration in Laboratory Rodents

Chair: Michael Taffe, University of California, San Diego

Abstract: Widespread availability of Electronic Nicotine Delivery Systems (ENDS; "e-cigarettes") in the past several years led to a concerning rebound of adolescent nicotine use. E-cigarettes have also been adopted for recreational and medical use with cannabis extracts and flower. The flexibility of these devices, more accurately termed Electronic Drug Delivery Systems (EDDS), supports use for a wide variety of substances beyond nicotine. This recent phenomenon expands a longer tradition of inhalation as a preferred route of administration for some users of nicotine, opioids, cannabis, cocaine and methamphetamine. In the ~60 years since Weeks (1962) and Thompson and Schuster (1964) reported intravenous self-administration (IVSA) of morphine in rats and monkeys, preclinical models for IVSA have been widely applied, whereas models of inhaled drug self-administration have languished, despite the clinical relevance. The EDDS technology has invigorated efforts to establish models which can evaluate the consequences of both inhalation drug self-administration as well as any risks that may be specific to the EDDS/e-cigarette devices. This workshop will bring together labs working on new rodent vapor-inhalation models for a robust discussion of technical approaches, progress, hurdles and strategies for effective forward progress. The long history of IVSA models has identified many criteria for inferring that self-administration has been established, and the workshop will discuss the relative necessity for features such as increasing workloads, dose-substitution, antagonist challenge, escalation, extinction, reinstatement and other methodological features. While self-administration is a primary concern, the workshop will also discuss reinforcing effects and voluntary consumption outside of canonical definitions of self-administration.

2.1 Vapor Inhalation Self-Administration Models for Nicotine

Brandon Henderson, Marshall University School of Medicine

2.2 Nicotine Vapor Exposure in Rats Produces Withdrawal Symptoms and Discrimination for Stimuli That Signal the Control of Vapor Delivery

Laura O'Dell, University of Texas at El Paso

2.3 Sticky Business: Considerations for Optimizing Models of Volitional Cannabis Exposure

Ryan McLaughlin, Washington State University

2.4 Vaping Rats: A DIY Adventure

Jibran Khokhar, University of Guelph

2.5 Operant Self-Administration of THC Vapor – the Long and Winding Road

Elise Weerts, Johns Hopkins University School of Medicine

4:00 p.m. - 5:00 p.m.

3. Workshop: Navigating a Career in Addiction Science

Chair: Cecilia Bergeria, Johns Hopkins University School of Medicine

Abstract: There are several career paths for addiction scientists, yet the knowledge on how to navigate a given career can be limited as a function of available mentorship and resources. Opportunities may exist for addiction scientists that are suited for their skillsets or expertise but are otherwise inaccessible because of a lack of institutional knowledge on how to pursue certain career paths. The purpose of this workshop is to provide early career attendees the opportunity to hear from a diverse group of addiction scientists pursing a range of professions in academia, industry, and government agencies. This workshop will provide valuable information to early career attendees about skill sets, experiences, and expertise required to be successful in various careers as addiction scientists. Our speakers include preclinical, clinical and epidemiological addiction scientists with experience in industry (Pew Charitable Trust, Canopy Growth Inc.), government (FDA), and academic (research institute, teaching institute and clinic-based research) agencies. Presenters will share experiences that prepared them to succeed, what their day-to-day work entails, and what opportunities for growth are available. The workshop will also include breakout groups with each speaker which will allow early career attendees to ask directed questions about specific career paths. CPDD is successful, in part, because of dedicated addiction scientists with careers in academia, industry, and government who collaborate to advance the understanding of addiction science. This

workshop will help provide new knowledge to early career attendees on how to pursue such careers and will ultimately enrich the future membership of CPDD.
Co-Chair: Denise Vidot, University of Miami

3.1 Drug Abuse Research at a Primarily Undergraduate Institution: Balancing the Classroom and Laboratory
Ryan Lacy, Franklin and Marshall College

3.2 Navigating Substance Use Disorder Careers Outside of Academia
Alexandra Duncan, The Pew Charitable Trusts

3.3 Becoming a Regulatory Scientist: Evaluating Drug Abuse-Related Risk During Drug Development
Jovita Randall-Thompson, US Food and Drug Administration

3.4 The Role of the Psychiatrist in Academic Research
Denis Antoine, Johns Hopkins University School of Medicine

3.5 Trading Paces: One Perspective on the Journey From Academia to Industry
Erica Peters, Canopy Growth Corporation

5:15 p.m. - 6:30 p.m.

4. Human Forum: Ethical Challenges in Addiction Research During the COVID-19 Pandemic: Innovative Approaches and Lessons Learned

Chair: Victoria Votaw, University of New Mexico
Co-Chair: Linda Cottler, University of Florida

Abstract: The College of Problems on Drug Dependence Human Research Committee presents a forum focusing on ethical challenges in addiction research during the COVID-19 pandemic. This public health emergency poses numerous dilemmas to human subjects researchers, such as adaptations to research methodologies, requirements for informed consent, and participant safety, among other considerations. Notably, there is much concern about the collision of the COVID-19 pandemic and addiction, particularly the opioid epidemic. This collision is characterized by COVID-19 disproportionately affecting individuals with substance use disorders due to environmental and health-related risk of infection, as well as decreased access to resources to address substance use. It is therefore necessary to continue engaging these populations in addiction research, but to do so in a way that maximizes benefits and minimizes harm. Forum speakers will give overviews of ethical challenges faced during the COVID-19 pandemic, as well as innovative solutions to address these challenges and lessons learned. Discussion content will include the following: risk-benefit analysis, IRB considerations, recruitment, informed consent, adapting research methodologies, handling missing data, participant and researcher safety, and rapid research. The talks will be bookended by an introduction and a robust discussion period moderated by an expert senior discussant. By focusing on innovative solutions and lessons learned, this discussion will help to minimize the impact of future public health emergencies on progress in addiction research.

4.1 Ethical Considerations for Conducting Virtual Community-Based Research With People who Inject Drugs During COVID-19
Angela Bazzi, University of California, San Diego

4.2 Managing a Complex Multisite Clinical Trial During COVID: Perspectives From a Participating Site in the CTN MOMs Study
D. Andrew Tompkins, University of California San Francisco School of Medicine

4.3 Managing a Complex Multisite Clinical Trial During COVID: Perspectives From the Lead Team of the CTN MOMs Study
Frankie Kropp, College of Medicine, University of Cincinnati

4.4 Challenges in Addiction Science Publishing During the COVID-19 Pandemic
Richard Saitz, Boston University School of Public Health
Discussant: Linda Cottler, University of Florida

Tuesday, June 22, 2021

10:00 a.m. - 11:00 a.m.

5. Innovator Symposium: Biological Targets of Medication-Based Therapies

Chair: Bertha Madras, Harvard Medical School, McLean Hospital, Mailman Research Center

Abstract: The isolation of hallucinogens, opioids, and cocaine from plants catalyzed intense curiosity regarding their mechanisms of action and design of therapeutics to treat addiction or other neuropsychiatric disorders. New technologies now enable high resolution visualization of receptor structures with 3-D imaging, their itinerary within cells, and mapping of signal transduction events. These new vistas have transformed drug discovery from serendipity, trial-and-error approaches to rational drug design. This symposium highlights advances in mechanisms of specific psychoactive substances: hallucinogens, opioids, cocaine. Certain hallucinogens are undergoing evaluation as therapeutics for neuropsychiatric disorders. Research on the critical target of hallucinogens in brain, the 5-HT2A receptor, has begun to clarify the structural determinants responsible for conformational rearrangements involved in receptor activation. The findings could accelerate discovery of improved drugs for the treatment of various neuropsychiatric disorders. The devastation of opioid overdose deaths has catalyzed research on how opioids bind specifically to activate their receptor targets, the itinerary of opioid receptors, and the ability of agonists to drive receptors to recruit one cellular interacting partner over another, i.e. 'biased signaling'. These revelations have enabled computational drug discovery, to design unique opioids that circumvent their adverse side effects. Cocaine overdose deaths have also risen significantly in recent years, refocusing attention on developing therapeutics to treat cocaine addiction. This segment provides an overview of candidate cocaine medications tested in clinical trials, and describes efforts to devise novel candidate cocaine medications, a challenging goal in view of transporter-mediated actions of cocaine.

5.1 A Crystal-Clear View of Psychedelic Drug Actions
Bryan Roth, UNC Chapel Hill Medical School

5.2 A Crystal-Clear View of Psychedelic Drug Actions
Bryan Roth, UNC Chapel Hill Medical School

5.3 Molecular Basis of GPCR Action: From Structures to New Leads
Aashish Manglik, University of California - San Francisco

5.4 Cellular Studies of Drug Actions Through GPCRs
Mark von Zastrow, UCSF Department of Psychiatry

5.5 Biological Targets of Medication-Based Therapies
Bertha Madras, Harvard Medical School, McLean Hospital, Mailman Research Center

5.6 Biological Targets of Medication-Based Therapies
Sandra Comer, Columbia University and NYSPI

11:30 a.m. - 12:00 p.m.

6. Mini-Symposium: Black Science Matters!

Chair: Ayana Jordan, Yale University School of Medicine
Co-Chair: Tamika Zapolski, Indiana University Purdue University Indianapolis

Abstract: There are strong and increasing levels of evidence of disparities in access to treatment by race. This symposium will address three related studies on this topic. First, we will present a summary of our systematic review of all existing randomized clinical trials reporting differences in substance use treatment initiation, engagement and outcome by race/ethnicity. Second, we will report on findings from an uncontrolled pilot delivering web-based CBT (CBT4CBT) to Black Adults with SUDs in the Black Church as well as data on racial effects in response to computerized CBT from 5 clinical trials. Third, we will describe study design for a randomized clinical trial that will assign 200 Black adults with current AUD to either CBT4CBT in the Black church or referral to standard treatment in a specialty addiction setting, with a 9-month follow-up to evaluate durability of treatment effects. Primary outcomes include retention (initiation of treatment, engagement for at least 4 weeks) and percent days abstinent from alcohol (PDA).

6.1 The RCT Substance Use Outcomes Systematic Review by Race/Ethnicity
Charla Nich, Yale University

6.2 An Evaluation of Racial & Ethnic Disparities in Alcohol, Cannabis, and Illicit Substance Use Treatment Initiation, Engagement, and Treatment Outcome: A Systematic Review of Randomized Clinical Trials
Stephanie Quainoo, Quinnipiac University

6.3 Cannabis, Social Equity and Black America
LaTrice Montgomery, College of Medicine, University of Cincinnati

12:30 p.m. - 1:30 p.m.
7. Workshop: Big Data Science Approaches to Identify Novel Behavioral and Biological Mechanisms of Addiction

Chair: Susan Wright, NIDA/NIH

Abstract: The untapped power of large-scale data emerging from addiction studies lies in big data science mining, integration, and analysis. The emerging field of big data science is inextricably linked with artificial intelligence, particularly machine learning approaches. This symposium will explore the opportunities and challenges that come with the convergence of big data, machine learning, and high-performance computing through examples from digital phenotyping of large scale population data, examination of the Adolescent Brain Cognitive Development (ABCD) data, chromatin interactions and dopaminergic neuron function, and use of supercomputing in systems biology. All of these presentations are leveraged to reveal new aspects of addiction biology. Presentations will cover findings from a range of advanced computational approaches, including digital phenotyping, using latent variables and statistical causal inference with large data sets to develop explanatory models of behavior, a bioinformatics framework to interrogate neurobiological effects of genetic risk factors for cigarette smoking and alcohol use traits, and the use of supercomputing and systems biology to address challenges in substance abuse research. The discussant, a Program Director at NIDA (Dr. Wright), will offer a perspective on how big data science can be leveraged to reveal new aspects of addiction biology and how incorporating data science as a new tool for the study of substance use disorders will bring together researchers with expertise in a variety of disciplines. The discussion will also focus on the importance and necessity of data science training for combining the latest computational capabilities with biomedical research to advance this field.

7.1 Big Data Science Approaches to Identify Novel Behavioral and Biological Mechanisms of Addiction
Lindsey Friend, National Institution on Drug Abuse

7.2 Digital Phenotyping: Methodologies for Addiction Research
Brenda Curtis, NIH/NIDA-IRP

7.3 Latent Variables and Statistical Causal Inference With Large Data Sets: Using ABCD to Develop Explanatory Models of Behavior
Martin Paulus, Laureate Institute for Brain Research

7.4 Chromatin Interaction Profiles in Cortical and Dopaminergic Neurons Help Identify Biological Principles Underlying Substance Use Disorder
Hyejung Won, University of North Carolina at Chapel Hill

7.5 Embracing Complexity: The Use of Supercomputing and Systems Biology to Address Challenges in Substance Abuse Research
Daniel Jacobson, Oak Ridge National Laboratory

7.6 Big Data Science Approaches to Identify Novel Behavioral and Biological Mechanisms of Addiction
Susan Wright, NIDA/NIH

12:30 p.m. - 1:30 p.m.
8. Symposium: Intersection of Minority Health, Health Disparities, and Social Determinants of Health With Psychopharmacology and Substance Use

Chair: Adam Leventhal, Keck School of Medicine, University of Southern California

Abstract: Across substance use outcomes, ethno/racial minorities in the U.S. experience a disproportionately higher burden of negative health outcomes, and lower access to care. This symposium will “unpack” various levels of analysis in substance use disparity research, ranging from psychopharmacology, individual differences, social determinants, and psychometrics across the lifespan. The chairs will review a multi-level framework for addictions disparity research, and Dr. Leventhal will present research examining nicotine withdrawal as a cardinal component of nicotine addiction, using a sample of African American smokers (n=667) assessed after ad lib smoking (nicotine non-deprived) and after overnight abstinence (nicotine deprived) to induce withdrawal. Dr. Leventhal will investigate if the frequency of experiencing discrimination predicts variability in the urge to smoke.

Dr. Zapolski will use data across two developmental periods to investigate the role of impulsivity in the relationship between discrimination and substance use among ethno/racial minority adolescents (n=112) and young adults (n=502), which can advance our understanding of how these processes develop. Dr. Fisher will examine the influence of social support (parents and teachers) on the relationship between ethnic identity and substance use in multi-racial youth (n=523), an important topic as multiracial youth are often not included in research comparing racial/ethnic groups. Dr. Lopez-Vergara will investigate the cultural equivalence of measures from a psychometric perspective; and will use structural equation modeling to test for the measurement invariance of subjective effects of drugs across ethno/racial groups (n=1,054). Finally, Dr. Avila will integrate results with an eye towards building a future blueprint for addiction disparity research.

8.1 "Unpacking" the Psychometric Properties of Subjective Effects of Drug Use: Are We Measuring the Same "Things" Across Race/Ethnicity?

Hector Lopez-Vergara, University of Rhode Island

8.2 Does Experiencing Discrimination Increase the Addictiveness of Nicotine in African American Smokers?

Adam Leventhal, Keck School of Medicine, University of Southern California

8.3 The Effect of Impulsivity on the Relationship Between Discrimination and Substance Use Across Development Among Ethno/Racial Minority Youth and Young Adults

Richelle Clifton, Indiana University Purdue University Indianapolis

8.4 Ethnic Identity and Substance Use in Multiracial Youth: The Moderating Role of Support Networks

Sycarah Fisher, University of Georgia

8.5 "Unpacking" the Psychometric Properties of Subjective Effects of Drug Use: Are We Measuring the Same "Things" Across Race/Ethnicity?

Hector Lopez-Vergara, University of Rhode Island

8.6 Intersection of Minority Health, Health Disparities, and Social Determinants of Health With Psychopharmacology and Substance Use

Albert Avila, National Institute on Drug Abuse, National Institutes of Health

12:30 p.m. - 1:30 p.m.

9. Symposium: Getting Further, Faster: Models to Advance the Implementation of Personalized Genetics for Tobacco Use Disorder in Routine Health Services

Chair: Alex Ramsey, Washington University School of Medicine

Abstract: The past decade has ushered in paradigm-shifting genomic discoveries into the contribution of CHRNA5 and CYP2A6 as strong genetic risk factors for tobacco use disorder (TUD) and smoking-related diseases. Despite much enthusiasm for exploring the behavioral impact of returning these personalized results, widespread implementation in real-world practice has been elusive. Increased attention to conceptual models that guide the development of emerging innovations will accelerate progress from basic science through clinical trials to implementation of genetic biomarkers for population health impact. To advance the field and inform the optimal integration of clinical genetics in TUD health services, we have convened a panel of experts in smoking-related genetics, tobacco control, behavioral medicine, health risk communication, and implementation science. This symposium will provide a current review of the leading genetic biomarkers in TUD and propose models to determine whether a given biomarker is ready to proceed to the next stage of innovation development, clinical trial testing, or implementation research. Leveraging examples of existing population-level genetic screening efforts for genetic susceptibility (e.g., Lynch syndrome, BRCA1/2, and familial hypercholesterolemia), the panel will collectively identify a range of implementation readiness determinants—including windows of effect size, ease and frequency of testing, consumer demand, risk-benefit ratio, and cost—forming the basis of guidelines to inform clinical researchers about existing deficiencies and the likelihood that the biomarker of interest can achieve population health impact. The proposed models will define thresholds for key decision criteria as guidelines for moving promising biomarkers for TUD along the research pipeline toward implementation.

9.1 The Road Ahead for Implementation of Genomics for Tobacco Use Disorder Care: Moving From Crystal Ball to Scientific Vision

Laura Bierut, Washington University School of Medicine

9.2 Designing for Implementation of a Genetically Informed Intervention for Tobacco Use Disorder

Alex Ramsey, Washington University School of Medicine

9.3 Integrating Precision Approaches to Smoking Cessation in the Clinic, Hospital and Community: Insights and Challenges

Hilary Tindle, Parthenon Management Group

9.4 Communicating Genetic Risk: Challenges and Opportunities for Implementation

Kimberly Kaphingst, University of Utah

9.5 Advancing the Implementation of Precision Interventions: Through a Behavioral Medicine Lens

Colleen McBride, Emory University

9.6 The Promise and Challenges of Genomics for Personalized TUD Services

Shelley (Zu-In) Su, National Institute of Drug Abuse, National Institutes of Health

2:00 p.m. - 3:00 p.m.

10. Symposium: Muscarinic Receptors as Therapeutic Targets for Alcohol and Substance Use Disorders

Chair: Carrie Jones, Vanderbilt University

Abstract: Accumulating evidence indicates that selective allosteric modulation of muscarinic acetylcholine receptors (mAChR) may provide novel therapeutic strategies for alcohol and substance use disorders. In this symposium, we will review preclinical and translational studies targeting the M1, M4, and M5 mAChR subtypes for the treatment of stimulant, opioid, and alcohol dependence across the stages of the addiction cycle. Dr. Carrie K. Jones will provide a brief biology overview of the different mAChR subtypes and the medicinal chemistry optimization of several M1, M4, and M5 mAChR allosteric agonists and modulators currently used in addiction research. Dr. Morgane Thomsen will describe findings from knockout mouse studies and will discuss the impact of M1 allosteric agonists and M4 PAMs (VU0364572, VU0467154) on the discriminative stimulus effects of cocaine, cocaine self-administration and seeking, as well as decision-making, impulsivity, and extracellular striatal dopamine levels after acute and chronic administration in rodents. Dr. Robert Gould will next described studies showing that M5 NAMs attenuate cocaine- and oxycodone- related behaviors, including blocking acquisition of oxycodone self-administration without altering opioid-induced antinociception. Finally, Dr. Andrew Lawrence will present his exciting cross-species back-translational findings demonstrating that long-term alcohol consumption downregulates M4 mAChR expression in humans and rodents on dopamine D1 receptor-expressing medium spiny neurons in the dorsolateral striatum. Additionally, he will show that systemic and direct-site infusion of either the M4 PAM VU0467154 or the M5 NAM ML375 decreases ethanol self-administration and cue-induced reinstatement of ethanol seeking in ethanol-preferring rats.

10.1 The Curious Effects of M1 and M4 Receptor Stimulation - A Pharmacotherapy for Cocaine Addiction?

Morgane Thomsen, Psychiatric Center Copenhagen

10.2 Development of Novel Muscarinic Receptor NAMs and PAMs for Addiction Research

Carrie Jones, Vanderbilt University

10.3 The Curious Effects of M1 and M4 Receptor Stimulation - A Pharmacotherapy for Cocaine Addiction?

Morgane Thomsen, Psychiatric Center Copenhagen

10.4 M5 mAChR NAMs Attenuate Cocaine and Oxycodone-Related Behaviors Without Altering Opioid-Induced Antinociception

Robert Gould, Wake Forest School of Medicine, Department of Physiology/Pharmacology

10.5 Muscarinic Receptors & Alcohol Seeking

Andrew Lawrence, Florey Institute of Neuroscience & Mental Health

10.6 Discussion on the Future of mAChRs as Therapeutic Targets for Addiction Disorders

David McKinzie, Indiana University School of Medicine

2:00 p.m. - 3:00 p.m.

11. Workshop: Increasing Availability of Evidence-Based Treatments for Drug Dependence Through Implementation Science and Novel Study Designs: Case Examples from Medication for Opioid and Stimulant Use Disorders

Chair: Erin Finley, UT Health San Antonio

Abstract: Although buprenorphine has been recommended as an evidence-based treatment for opioid use disorder for more than 15 years, medication for OUD is not universally adopted as part of routine care and remains difficult to access in many areas. As evidence accumulates to support the utility of novel medications for other substance use disorders, this workshop will discuss challenges in buprenorphine implementation efforts before educating participants in guidelines and methods to support rapid spread of novel clinical treatments. Dr. Jennifer Potter will first present the history of buprenorphine implementation (successes and failures) for OUD since FDA approval in 2002, highlighting key challenges and lessons learned. Dr. Alison Hamilton will then present on the role for implementation science and value of hybrid implementation-effectiveness study designs in facilitating spread and sustainment of evidence-based treatments. Dr. Holly Lanham will then present on current efforts to scale up medication for OUD across the state of Texas, describing how this work builds on the SHIFT-Evidence implementation framework and principles of hybrid study design. Using lessons learned from buprenorphine implementation, Drs. Jennifer Potter and Erin Finley will then co-lead an interactive discussion of an implementation research agenda for a novel evidence-supported treatment for stimulant use disorder, engaging the audience in the process of designing and launching a sample implementation plan.

11.1 Lessons Learned From the Failures of Buprenorphine Implementation: A Call to Action

Jennifer Potter, University of Texas Health San Antonio

11.2 The Role for Implementation Science and Value of Hybrid Implementation-Effectiveness Study Designs in Facilitating Spread and Sustainment of Evidence-Based Treatments

Alison Hamilton, UCLA

11.3 Applying the Shift-Evidence Implementation Framework and Principles of Hybrid Study Design to Scale up Medication for OUD in Texas

Holly Lanham, UT Health Science Center at San Antonio

2:00 p.m. - 3:00 p.m.

12. Workshop: Improving Equity in Substance Use Disorder Treatment: How Can Digital Technologies Reduce Health Disparities Across Members of Racial and Ethnic Minority Groups?

Chair: Sarah Moore, Dartmouth College

Co-Chair: A. Kathleen Burlew, University of Cincinnati

Abstract: Members of racial and ethnic minority groups have experienced disparities in healthcare across a range of conditions including substance use disorders (SUDs). Among persons with SUDs, disparities may be widening due to COVID-19. Use of digital technologies (e.g., telehealth; digital therapeutics) to deliver healthcare has expanded and is even more relevant during this pandemic. However, technologies may offer opportunities to improve treatment for SUDs beyond the pandemic if offered in accessible ways, relevant to target population' experience.

This workshop, developed by the Center for Technology and Behavioral Health, in collaboration with the National Drug Abuse Treatment Clinical Trials Network Minority Special Interest Group, will examine the role of digital health interventions in reducing health disparities among members of racial and ethnic minority substance using groups and explore implications for technology-related substance use research.

We will first present the results of a scoping review of SUD treatment research that examines how technology (e.g., social media, mobile devices) may impact health disparities in SUD treatment (e.g., treatment access, retention, outcomes, and satisfaction). Presenters who use digital health approaches (i.e., Twitter, ecological momentary assessment, web-based interventions) to address substance use among Black, Latinx, and Native American populations will describe their line of research and findings. We will conclude by inviting audience members to join a conversation about how to harness technologies to reduce racism in SUD treatment. Attendees will increase their understanding of how to accelerate a research agenda using technologies to reduce health disparities in substance use treatment.

12.1 Adaptation and Testing of a Digital Therapeutic With Urban American Indian/Alaska Native Communities: Process and Preliminary Outcomes
Aimee Campbell, Columbia University Irving Medical Center and New York Psychiatric Institute

12.2 Blunt Buzz: Twitter-Based Intervention for African American Young Adult Blunt Smokers
LaTrice Montgomery, College of Medicine, University of Cincinnati

12.3 Ethics and Acceptability of Employing Digital Technologies for Data Collection in Substance Use Research With Latina and Pregnant Women
Pilar Sanjuan, University of New Mexico
Discussant: Sara Matsuzaka, Fordham University

4:00 p.m. - 5:00 p.m.

13. Workshop: 27th Annual Contingency Management Working Group

Chair: August Holtyn, Johns Hopkins University School of Medicine
Co-Chair: Diann Gaalema, University of Vermont

Abstract: The Contingency Management (CM) Working Group, held annually during the CPDD convention, is an opportunity for the discussion and dissemination of current research on the use of CM interventions to promote behavior change and reduce drug use. CM is a behavioral treatment strategy that has demonstrated consistent success in promoting abstinence from a wide range of drugs and across many different treatment populations. It is also being used to promote change in behaviors impacting the course of other chronic diseases (e.g., obesity, diabetes). At the 27th annual meeting of the CM Working Group, junior and senior researchers will present preliminary data from ongoing studies involving CM. The goal for this working group is to provide an informal outlet for discussion of ongoing CM research, with an emphasis on developing or improving research strategies by seeking audience input and providing opportunities for junior and senior researchers to interact. The goal of this working group has always been to provide an informal outlet for discussion of CM data; participants and topics will be chosen during the Spring of 2021 to capture the most current data in contingency management for presentation at our annual working group.

13.1 Recent Advances in the Area of Contingency Management II
August Holtyn, Johns Hopkins University School of Medicine

13.2 Recent Advances in the Area of Contingency Management
Diann Gaalema, University of Vermont

5:15 p.m. - 6:30 p.m.

14. Animal Forum: Six Decades of Self-Administration Research: What Have We Found—or Lost—in Translation?

Chair: James Rowlett, University of Mississippi Medical Center

Abstract: Since the original publications of Weeks (1962) as well as Deneau, Yanagita, and Seevers (1969), self-administration research in animals has developed into a foundational approach for the study of nearly all factors underlying substance use disorders (SUDs). Although the technology has advanced considerably in six decades, the basic premise is the same: When given the opportunity, an animal will perform a response that results in intake of a drug. In the most basic sense, the self-administration procedure is "translational" due to the fact that individuals with SUDs also engage in behavior resulting in drug intake. The overall goal of this CPDD Animal Forum is to explore how nonhuman animal research using self-administration approaches informs our understanding of SUDs, as well as to delve into how human laboratory and clinical research using self-administration informs and improves nonhuman animal research. In order to gain a historical framework on self-administration, Dr. Michael Nader will review and discuss the development of this key model from humble beginnings to the present. Over many decades, self-administration models have played a key role in regulatory decisions by government agencies as well as abuse liability assessments by the pharmaceutical industry—a unique perspective that will be discussed by Thomas Hudzik. Laboratories employing human subjects often use self-administration procedures that are essentially identical in principle to non-human animal methods, and Dr. Sandra Comer will discuss these techniques in relation to animal models and how this research guides clinical research.

14.1 Animal Models of Drug Abuse: From Predictive to Homologous Models

Michael Nader, Wake Forest School of Medicine

14.2 Bridges and Gaps: Industry-Sponsored Predictive Modeling of Abuse Potential of New Medications

Thomas Hudzik, BlueRock Therapeutics

14.3 Drug Self-Administration Procedures: Using Non-Human and Human Laboratory Studies to Predict Clinical Treatment Outcomes

Sandra Comer, Columbia University and NYSPI

Wednesday, June 23, 2021

10:00 a.m. - 11:00 a.m.

15. Workshop: Meeting the Challenge of the Psychedelics and CNS Drugs With Novel Mechanisms – Building on the Foundation of the FDA 2017 Guidance on the Assessment of Abuse Potential

Chair: David Heal, DevelRx Ltd

Abstract: The FDA Assessment of Abuse Potential of Drugs: Guidance for Industry in 2017 provided comprehensive advice on the processes and experimental procedures and has provided a solid foundation for this important aspect of Safety Pharmacology testing of new CNS drugs. We are entering an era in which a new generation of drugs to treat psychiatric and neurological disorders is being developed that are C-I psychedelics or compounds with novel pharmacological mechanisms very different from those of known substances of abuse. It is therefore timely to hold an interactive workshop to revisit the FDA 2017 Guidance to explore and discuss refinements and innovations in non-clinical and clinical testing procedures necessary to identify and quantify the degree of abuse and dependence risks posed by this new generation of CNS drugs.
The objective is to stimulate a highly interactive discussion between all stake-holders, viz pharma, academia, CROs, and CSS/FDA, to ensure that we are able to adapt to continue making accurate experimental-based predictions of abuse risks and ensure that restrictions on clinical use of a new generation of CNS drugs is evidence-based and proportional.

15.1 Introductory Overview of the FDA 2017 Guidance

Jack Henningfield, Pinney Associates, Inc.

15.2 Refinements and Innovations in Non-Clinical Abuse Evaluations

David Heal, DevelRx Ltd

15.3 Too Much Monkey Business – Rationale for the Use of Primates in Abuse Evaluations

Charles France, University of Texas Health Science Center

15.4 Designing Human Abuse Potential Trials for Novel CNS-Active Compounds: Balancing Science With Strategy

Judy Ashworth, Pinney Associates, Inc.

10:00 a.m. - 11:00 a.m.

16. Symposium: Transcranial Magnetic Stimulation as an Addiction Therapeutic: Insights From Clinical and Preclinical Studies

Chair: Vaughn Steele, Yale University School of Medicine Department of Psychiatry

Abstract: Decades of preclinical and clinical research have taught us that addiction is, indeed, a disorder of dysregulated circuits. Until recently, however, there were no circuit-based treatments for substance use disorders (SUDs). In 2020, a unique form of transcranial magnetic stimulation (TMS) received FDA-clearance to aid smoking cessation. This has opened the door to a wide range of emerging TMS-based therapeutic options for SUDs. This symposium will showcase several recent, and transformational advances in preclinical and clinical TMS-based SUD therapeutics. Dr. Lu will present data demonstrating the effect of a preclinical focal TMS coil that induces single-limb movement and its implications for treating cocaine dependence. Coil specificity in preclinical models help uncover neurobiological mechanisms of TMS and will accelerate advances in developing TMS-based therapeutics for SUDs. This will be followed by clinical TMS treatment studies in cannabis, opiate, and cocaine users. Specifically, Dr. George will present results from a randomized controlled trial of TMS in

cannabis use disorder (20 Hz, bilateral dorsolateral prefrontal cortex (DLPFC)). Dr. Hanlon will present results of a study evaluating the relative efficacy of two potential TMS treatment targets as tools to decrease pain and promote opiate sparing (Motor Cortex, DLPFC). Finally, Dr. Steele will present new data which demonstrates that chronic TMS can reduce cocaine use (theta burst, DLPFC). Together, TMS shows tremendous promise in treating SUDs, especially as an adjuvant to other treatments. Similarities and differences among studies and a path forward will be the primary topic of discussion to summarize this work.

16.1 Transcranial Magnetic Stimulation as an Addiction Therapeutic: Insights From Clinical and Preclinical Studies
Colleen Hanlon, Wake Forest Health Sciences

16.2 Development of Focal TMS and Its Application to a Rat Model of Cocaine Dependence
Hanbing Lu, NIDA Intramural Research Program

16.3 Effects of Repetitive Transcranial Magnetic Stimulation on Cannabis Use in Schizophrenia
Tony George, University of Toronto

16.4 A Tale of Two Sites: Identifying the Optimal Neural Target for TMS-Assisted Pain and Opiate Reduction
Colleen Hanlon, Wake Forest Health Sciences

16.5 Intermittent Theta-Burst Stimulation as a Treatment for Cocaine Use Disorder: An Exemplar for Neuromodulation to Treat Substance Use Disorders
Vaughn Steele, Yale University School of Medicine Department of Psychiatry

16.6 Past, Present, and Future of TMS in Addiction Medicine
Travis Baker, Rutgers University Center for Molecular and Behavioral Neuroscience

10:00 a.m. - 11:00 a.m.

17. Workshop: Living Hep C Free: Pain, Mental Health and Substance Use Behaviors Post-Cure Among People Who Inject Drugs

Chair: Irene Pericot-Valverde, Clemson University
Co-Chair: Judith Tsui, University of Washington

Abstract: The opioid use disorder (OUD) epidemic in the US has led to a significant increase in infectious diseases associated with drug-use behaviors, particularly hepatitis C virus (HCV) infection. Providing medications for opioid use disorder (MOUD), such as methadone or buprenorphine, besides reducing opioid use and overdose risk, can reduce HCV infections. Complementarily, providing HCV treatment to people with OUD not only cures HCV and reduces the likelihood of developing liver-related diseases (e.g., cancer, cirrhosis), but also engages these individuals in care, which is relevant as people who inject drugs (PWID) HCV-infected are especially vulnerable to present physical and psychiatric conditions in addition to their ongoing injecting risk behavior. This symposium will present data from two clinical trials involving PWID on MOUD receiving HCV treatment; one involving the PREVAIL study, a 3-arm randomized clinical trial of different models of HCV care which included 150 persons with OUD receiving MOUD, and the other involving the HERO study, a multi-site, 2-arm pragmatic clinical trial conducted in eight states involving 755 HCV-infected PWID. Lessons learned from these two trials will be discussed in the symposium, including (a)concerns about ongoing drug use and physical or psychiatric comorbidities among PWID should not be considered by health care providers to withhold HCV treatment in this population; (b)HCV treatment may be associated with improvements in mental health and pain as well as ongoing injecting risk behavior and vice versa. Overall, the symposium will provide evidence that HCV treatment has important implications for PWID that go beyond cure.

17.1 Changes in Depressive and Anxiety Symptoms Among People Who Inject Drugs With and Without Opioid Use Disorder Treated for Hepatitis C Virus
Irene Pericot-Valverde, Clemson University

17.2 Substance Use and Injecting Behaviors Among Persons Who Inject Drugs During and After Hepatitis C Treatment
Judith Tsui, University of Washington

17.3 Self-Reported Pain Before and After Cure of Hepatitis C Among People Who Actively Inject Drugs
Natasha Ludwig-Barron, University of Washington

11:30 a.m. - 12:00 p.m.
18. Mini-Symposium: Fentanyl 101: An Anesthesiologist Perspective on Fentanyl in the Opioid Crisis and Harm Reduction Implications

Chair: Phillip Torralva, Oregon Health & Science University / CODA, INC

Abstract: Opioid overdose, as per the most recent CDC data, is the most common cause of accidental death in U.S. adults ages 18-50, where fentanyl and fentanyl analogues (F/FA) appear to be the most common drugs involved in these fatalities and have been demonstrated to be resistant to naloxone. High doses of F/FA (e.g. sufentanil and carfentanil) cause Wooden Chest Syndrome (chest wall rigidity and vocal cord closure) (WCS) 90 - 120 seconds after rapid injection, which persist for up to 10 minutes and is well documented in the field of anesthesia. Unfortunately, these effects are not commonly known outside of the field of anesthesiology until recently, as increasing reports of overdoses involving atypical presentations have emerged with fentanyl. As per existing medical literature, heroin and morphine do not cause VCC in humans, suggesting distinct pharmacological mechanisms underlying acute onset F/FA-induced FIRE, and slower onset respiratory depression induced by heroin and morphine. Clinical research in humans has demonstrated that vocal cord closure (VCC) is the primary effect of F/FA in WCS and is now described in current literature as 'fentanyl-induced respiratory effects" (FIRE). Therefore, a re-conceptualization of the cause of the rising overdose deaths from F/FA should possibly include naloxone-resistant mechanisms in addition to respiratory depression. There are currently no FDA-approved treatments for FIRE. At this time, harm reduction education education and awareness of these effects by physicians, researchers and individuals at risk for F/FA exposure, must be a top priority until effective therapeutics are developed.

18.1 Differences Between Morphine and Synthetic Opioid Receptor Pharmacology

Aaron Janowsky, OHSU and VA Portland Health Care System

18.2 Fentanyl 101: An Anesthesiologist Perspective on Fentanyl in the Opioid Crisis and Harm Reduction Implications

Phillip Torralva, Oregon Health & Science University / CODA, INC

11:30 a.m. - 12:00 p.m.
19. Mini-Symposium: A Peek Inside DEA's Process: Drug Scheduling Actions, Pharmacological Testing, and Schedule I Research Registration

Chair: Olubukola Kalejaiye, Drug Enforcement Administration

Co-Chair: Luli Akinfiresoye, Drug Enforcement Administration

Abstract: The scientific staff of the Drug and Chemical Evaluation Section (DOE), Drug Enforcement Administration's Diversion Control Division, is responsible for collecting drug trafficking and abuse information and evaluating substances and chemicals for placement under the Controlled Substances Act (CSA). In this forum, DOE will provide a peek inside our daily operations and the scientific evaluation guided by the CSA as well as the process to approve Schedule I Researcher Registration applications. To inform drug control and policy decisions, DOE scientists collect law enforcement and public health data, and initiate pharmacology studies. DOE will discuss our programs collecting pharmacology and harm data for newly encountered substances to inform regulatory decisions and support expert testimony. Streamlining the collection and dissemination of this information is essential to our federal and international partners in prioritizing the most harmful and persistent of substances for control. With over 900 new psychoactive substances reported to the United Nations Office of Drugs and Crime, challenges are significant in protecting the public. DOE will continue to look for new opportunities to engage with the scientific community to improve data collection efforts and identify new opportunities to protect the public. As noted, the conduct and publication of research is essential to informing regulatory and policy decisions and the CSA provides a framework for these activities. As a scientific group, DOE remains a resource for researchers to assist with CSA requirements and compliance. With this talk, we hope to strengthen partnerships with the scientific community and identify new opportunities for engagement.

19.1 The United States Drug Enforcement Administration's Process for Drug Scheduling

Olubukola Kalejaiye, Drug Enforcement Administration

19.2 Research With the United States Drug Enforcement Administration: Conducting Pharmacology Contract Studies

Teneille Walker, Drug Enforcement Administration

19.3 Demystifying the Process to Conduct Research With Controlled Substances: United States Drug Enforcement Administration's Schedule I Researcher Registration

Paul Repaci, US Department of Justice, Drug Enforcement Administration

12:30 p.m. - 1:30 p.m.

20. Workshop: The Role of Police in Overdose Response and Post-Overdose Outreach

Chair: Alexander Walley, Boston University School of Medicine

Abstract: Surviving an overdose identifies individuals as particularly high-risk for subsequent overdose. In communities where overdose deaths are leading causes of preventable death, law enforcement and public health agencies are innovating to respond. One example includes post-overdose outreach, an emerging public health strategy that partners police and public health staff. In part, these partnerships have evolved because calling 911 to access emergency services during an overdose often results in a law enforcement response and 911 data are increasingly being used as data sources for overdose outreach. Many police agencies are adopting approaches from harm reduction (e.g., carrying naloxone, making referrals to substance use disorder treatment), yet there is considerable variation in practices across states and between urban and rural areas. Public safety priorities do not consistently align with public health priorities or the needs of people who use drugs (PWUD). With the historically fraught relationship between PWUD and police, the role of police in these partnerships warrants ongoing examination. Research into the evolving role of law enforcement and public health partnerships is critical to navigating the current co-incident crises of opioid overdose deaths and law enforcement-related violence. This symposium will explore the intended and unintended consequences of police involvement in overdose response and post-overdose outreach. We will present current research on 911 data use and privacy, warrant checking, incarceration and the role of police during and after overdose. Our discussant will put this research into the interwoven historical context of substance use, race, policing, and community relations.

20.1 The Role of Police in Overdose Response and Post-Overdose Outreach

Karla Wagner, University of Nevada

20.2 Ethnographic Decision Tree Modeling to Predict Calling 911 for an Overdose

Karla Wagner, University of Nevada

20.3 When Practice Doesn't Make Perfect: First Responders With Recent Experience Administering Naloxone Have More Negative Attitudes About Overdose Victims and Enabling Drug Use

Rachel Winograd, University of Missouri- St. Louis

20.4 Arrest Warrant Review Practices in Post-Overdose Outreach Programs in Massachusetts

Marco Tori, Boston Medical Center

20.5 Trends in the Prevalence of Incarceration Following a Non-Fatal Overdose Event

Brad Ray, Wayne State University

20.6 The Role of Police in Overdose Response and Post-Overdose Outreach

Ricky Bluthenthal, Keck School of Medicine University of Southern California

12:30 p.m. - 1:30 p.m.

21. Symposium: Female Sex Hormones and Addiction: Preclinical and Clinical Studies

Chair: Jessica Weafer, University of Kentucky

Abstract: Drug addiction has traditionally been considered a male-oriented problem. However, the sex gap in substance use is shrinking rapidly, due to alarming increases in drug and alcohol use in women. Additionally, findings in both human and animal models indicate that females have a faster course from initial drug use to addiction. As such, it is important to identify female-specific risk factors for drug and alcohol use, including the influence of female sex hormones (i.e., estrogen and progesterone) in risk for addiction. This symposium will present exciting new data highlighting the role of endogenous ovarian and synthetic hormones in addiction vulnerability. The speakers will present data using diverse approaches to study cellular, pharmacological, and neural mechanisms of behavior in animal and human models. Further, the symposium will address the influence of hormones on addiction vulnerability across a range of drugs, including nicotine, cocaine, methamphetamine, fentanyl, and alcohol. The speakers will present data pertaining to multiple risk factors, including rewarding and motivational aspects of drug use, subjective drug responses, and impaired inhibitory control. Collectively, these

findings illustrate that ovarian hormone levels have a pronounced influence on susceptibility to problematic drug use. As such, this work has important implications for developing sex-specific prevention and treatment efforts for addiction, including the optimal timing of both neurobiological and behavioral interventions for women based on fluctuations in circulating sex hormones.

21.1 Natural and Synthetic Estrogens Specifically Alter Nicotine Demand and the Reward Pathway
Cassandra Gipson-Reichardt, University of Kentucky

21.2 Natural and Synthetic Estrogens Specifically Alter Nicotine Demand and the Reward Pathway
Cassandra Gipson-Reichardt, University of Kentucky

21.3 Sex and Hormonal Influences on the Development of an Addiction-Like Phenotype in Rats
Wendy Lynch, University of Virginia

21.4 Synthetic Sex Hormones Influence Subjective Responses to Alcohol and Methamphetamine
Emma Childs, University of Illinois

21.5 Neural and Hormonal Influences on Sex Differences in Inhibitory Control Among Heavy Drinkers
Jessica Weafer, University of Kentucky

21.6 Female Sex Hormones and Addiction: Preclinical and Clinical Studies
Rita Goldstein, Icahn School of Medicine at Mount Sinai

12:30 p.m. - 1:30 p.m.

22. Symposium: NIDA's "Ten Most Wanted" for Medications Development: Where Are We Now?

Chair: Tatiana Ramey, National Institutes of Health

Abstract: NIDA's Division of Therapeutics and Medical Consequences (DTMC) has developed Medication Development Priorities in Response to the Opioid Crisis: Ten Most Wanted. Ten most promising drug mechanisms were listed based on data from published literature and internal DTMC studies that felt would have the most direct relevance to desirable treatment effects and clinical endpoints for OUD. Importantly, most of these mechanisms are active in more than one model, and for more than one drug of abuse, which presents the intriguing possibility of their potential efficacy in treating poly-drug abuse or other Substance Use Disorders (SUDs).

This symposium will review the current situation in drug development for SUDs and chart the course for the future. There will be will an update and project status on the Ten Most Wanted mechanisms, as well as touch upon other mechanisms, beyond the initial ten, that since then gain the attention of addiction drug developers. The review of the preclinical data with opioids for the Ghrelin GHS1α receptor antagonist will be given. New data and updates on human imaging outcomes and behavioral laboratory studies results of a 5-HT2C receptor agonist and 5HT2A receptor antagonist will be discussed. Exciting new preliminary results on Alpha-2-adrenergic receptor agonist - a Phase 1b/2 study of dexmedetomidine (BXCL501) to treat symptoms of acute opioid withdrawal.

22.1 Ghrelin GHS1α Receptor Antagonist: Preclinical Update on Opioids
Kathryn Cunningham, University of Texas Medical Branch

22.2 Progress in the Clinical Development of NIDA's Ten Most Wanted
Kurt Rasmussen, National Institute of Drug Abuse, National Institutes of Health

22.3 Ghrelin GHS1α Receptor Antagonist: Preclinical Update on Opioids
Kathryn Cunningham, University of Texas Medical Branch

22.4 5-HT2C Agonist and 5HT2A Antagonist: Updates on Human Imaging and Behavioral Laboratory Studies
F. Gerard Moeller, Virginia Commonwealth University

22.5 Alpha-2-Adrenergic Receptor Agonist: Preliminary Results of a Phase 1b/2 Study of Dexmedetomidine (BXCL501) to Treat Symptoms of Acute Opioid Withdrawal
Sandra Comer, Columbia University and NYSPI

22.6 Current Drug Development for Ten Most Wanted Drug Mechanisms and Beyond
Tatiana Ramey, National Institutes of Health

2:00 p.m. - 3:00 p.m.

23. Symposium: New Medication Targets for Methamphetamine Use Disorder

Chair: Anna Moszczynska, Wayne State University

Abstract: Methamphetamine Use Disorder (MUD) is a global health problem, linked to an increasing rate of overdose deaths in the United States., where more than 700,000 people abuse the drug. Relapse after completing treatment is common, and there is no FDA-approved medication despite decades of focused research. Some medications have shown low efficacy in people who have light-to-moderate methamphetamine use but not in those who use the drug heavily. New drug targets are needed, particularly for people who abuse methamphetamine heavily because they suffer the most from methamphetamine abuse-related neuropsychological problems and are at high risk for relapse and death from methamphetamine overdose. This symposium will present the newest preclinical and clinical data on several potential molecular targets for the development of medications for MUD. Dr. Shoptaw will provide an update on recent developments in neuroimmune therapies for MUD, with a focus on phosphodiesterase-4 inhibitors and applications in a South African population. Dr. London will review evidence for metabotropic glutamate receptor-5 allosteric modulators as prospective medications and PET findings on mGlu5 receptors in brain, and. Dr. Dwoskin will present her drug discovery data on selective vesicular monoamine transporter-2 inhibitors. Finally, Dr. Moszczynska will present evidence for a role of parkin in MUD.

23.1 New Medication Targets for Methamphetamine Use Disorder
Edythe London, University of California Los Angeles

23.2 Update on Recent Developments in Neuroimmune Therapies for MUD
Steve Shoptaw, University of California Los Angeles

23.3 Allosteric Modulators of mGlu5 as Potential Therapeutics
Edythe London, University of California Los Angeles

23.4 Potent, Selective VMAT2 Inhibitors as Therapeutic Candidates for Methamphetamine Use Disorder
Linda Dwoskin, University of Kentucky

23.5 Investigating the Role of Parkin in Methamphetamine Use Disorder
Anna Moszczynska, Wayne State University

23.6 New Medication Targets for Methamphetamine Use Disorder
Karen Szumlinski, University of California Santa Barbara

2:00 p.m. - 3:00 p.m.

24. Workshop: "Science Doesn't Have to be Complicated": Revisiting Polydrug Use Patterns Using Innovative Analyses and Visualization Approaches

Chair: Mariano Kanamori, Miller School of Medicine, University of Miami

Abstract: The US drug use epidemic continues to escalate, with polydrug use increasingly being a cause of death. Understanding polydrug use is pivotal in identifying opportunities to end this epidemic. A marginalized and invisiblized group at a disproportionate risk of polydrug use and HIV risk includes injection drug users and Latino men. More specifically, among Latino men, Latino seasonal workers (LSW) and Latino men who have sex with men (LMSM) are hypothesized to have high polydrug use prevalence. Drug use hotspots such as South Florida elicit additional investigation. As current methods used to visualize polydrug use require significant training for use, are limited in utility and application, and are often difficult to interpret, communicating advances in polydrug research require user-friendly approaches. This mini-symposium will present three approaches to polydrug visualization: latent class analysis (LCA), social network analysis (SNA), and geospatial analysis. Each approach emphasizes unique nuances of polydrug use. LCA stresses the importance of treating unique groups based on emerging patterns; SNA visualizations demonstrate the importance of considering a drug's prevalence and centrality in polydrug use; and geospatial analyses can expand on SNA to visualize unique polydrug use hotspots. This mini-symposium will explore the intersection of innovative visualization approaches to disentangle polydrug use. Findings from this mini-symposium can facilitate policy and program design, implementation, and evaluation, due to its straightforward and palatable approach to researchers, policymakers, and community members. Additionally, this mini-symposium will provide an opportunity for attendees to understand how to use these analytical approaches in their own research.

Juan Arroyo-Flores, Miller School of Medicine, University of Miami

24.1 A Novel Approach to Visualizing Sociocentric Polydrug Use Networks Among People Who Inject Drugs in Miami, Florida: National HIV Behavioral Surveillance System, 2018
Edda Rodriguez, Miller School of Medicine, University of Miami

24.2 Latent Class Analysis of Polydrug Use Patterns Among Substance-Using Sexual and Ethnic Minority Men at Risk of HIV
Ariana Johnson, Student

24.3 Expanding Social Network Analysis of Polydrug Use Networks With a Spatially-Explicit Component to Inform Substance Use Policies and Programming
Cho-Hee Shrader, Miller School of Medicine, University of Miami

4:00 p.m. - 5:00 p.m.
25. Workshop: Epidemiology and Public Health Research Methods

Chair: Howard Chilcoat, Indivior, Inc.
Co-Chair: Maria Parker, Indiana University

Abstract: This proposal is for a continuation of the annual CPDD Epidemiology and Public Health Research Methods workshop series that was launched more than 10 years ago. This year's workshop will feature a series of methodologic approaches of interest to those conducting epidemiologic, prevention, and clinical research in the field of substance use and related disorders. Topics to be discussed include: 1) A New Odds Ratio Based Measure for Analysis of Epidemiological Associations with Applications to Cannabis Use Disorder; 2) Methodological Best Practices for Estimating Policy Effects in the Context of Co-occurring Policies, which can be a challenge in policy studies, particularly in the context of the opioid crisis where there has been a rapid growth of opioid-related policies addressing different components of the crisis; 3) Causal Mediation Analysis: A Conceptual Overview and Methodological Considerations will present an overview of causal mediation, namely estimation of a causal pathway linking an exposure and outcome, motivated by a case study examining LGB substance use disparities; 4) Group-based Trajectory Modeling in Substance Use Research, which is increasingly being applied in substance use research to capture heterogeneity in longitudinal patterns of use that may reflect different etiologic pathways and susceptibilities to misuse.

25.1 A New Odds Ratio Based Measure for Analysis of Epidemiological Associations With Applications to Cannabis Use Disorder
Olga Vsevolozhskaya, University of Kentucky

25.2 A New Measure for the Analysis of Epidemiological Associations: Cannabis Use Disorder Examples
Olga Vsevolozhskaya, University of Kentucky

25.3 Methodological Best Practices for Estimating Policy Effects in the Context of Co-Occurring Policies
Beth Ann Griffin, RAND Corporation

25.4 Causal Mediation Analysis: A Conceptual Overview and Methodological Considerations
Megan Schuler, RAND

25.5 Group-Based Trajectory Modeling in Substance Use Research
Beth Reboussin, Wake Forest University School of Medicine

4:00 p.m. - 5:00 p.m.
26. Workshop: Community Pharmacy-Based Models to Expand Access to Medications to Address the Opioid Epidemic and the Health of Persons who Use Drugs

Chair: Judith Tsui, University of Washington

Abstract: The opioid epidemic is a major public health crisis in North America, leading to substantial morbidity and mortality related to the consequences of opioid use disorders and injection drug use, namely hepatitis C virus (HCV), HIV, and overdose. Yet, we are at a unique moment in time, as we possess effective medications to: 1) cure HCV with directly-acting antivirals or DAAs; 2) prevent HIV infection with Pre-exposure Prophylaxis (PrEP); and 3) prevent overdose and treat opioid use disorders with naloxone and opioid agonist therapy (OAT), respectively. However, access to these potentially life-saving medications remains a major problem for people who use drugs. Pharmacists and community-pharmacy programs may be an innovative solution to this problem. Pharmacies are highly accessible with convenient locations and flexible hours. Pharmacists have high credibility

with community members and have shown their ability to engage with a range of high-risk populations including people who use substances. This workshop will describe ongoing research in the U.S. and Canada to leverage community-based pharmacies to address the health of vulnerable populations, including persons who use drugs, by expanding access to potentially life-saving medications. We will make recommendations for future research and implementation of pharmacy-based models to reduce HCV, HIV, overdose, and opioid use disorder.

26.1 Injectable Diacetylmorphine and Hydromorphone Pharmacy-Based Treatment Programs in Canada: Expanding Access to Care for Opioid Use Disorder
Nadia Fairbairn, University of British Columbia

26.2 Developing a Community-Pharmacy Model for Treating Persons who Inject Drugs for Hepatitis C
Judith Tsui, University of Washington

26.3 Injectable Diacetylmorphine and Hydromorphone Pharmacy-Based Treatment Programs in Canada: Expanding Access to Care for Opioid Use Disorder
Nadia Fairbairn, University of British Columbia

26.4 Advancing Access to Pre-Exposure Prophylaxis (PrEP) in Pharmacies to Increase Prep Uptake Among Black Men in Disadvantaged Areas
Natalie Crawford, Rollins School of Public Health, Emory University

26.5 A Four-State Stepped-Wedge Cluster Randomized Trial to Improve Provision of Naloxone, Buprenorphine, and Nonprescription Syringes in Community Pharmacies
Traci Green, Boston University School of Medicine

26.6 Community Pharmacy-Based Models to Expand Access to Medications to Address the Opioid Epidemic and the Health of Persons Who Use Drugs
Crystal Lewis, Nathan S Kline Institute/New York University School of Medicine

5:15 p.m. - 6:30 p.m.
27. Policy Forum

Chair: Sandra Comer, Columbia University and NYSPI

Abstract: The Policy Forum will consist of two parts. In Part I brief remarks summarizing Friends of NIDA's activities and accomplishments in the past year will be followed by an overview/report from Capitol Hill on budgetary and other factors affecting substance use research. Part II will include a panel discussion of the impact of classwide scheduling of fentanyl analogues on scientific research. Dr. Sandra Comer will provide an overview of the issue, Dr. Christopher Cunningham will consider the scheduling action from a chemist's perspective, and Dr. Marco Pravetoni will describe the impact of classwide scheduling on development of vaccines.

27.1 Policy Forum
Edward Long, Van Scoyoc Associates

27.2 Policy Forum
Sandra Comer, Columbia University and NYSPI

27.3 Policy Forum
Christopher Cunningham, Concordia University Wisconsin

27.4 Policy Forum
Marco Pravetoni, University of Minnesota Medical School

Thursday, June 24, 2021

10:00 a.m. - 11:00 a.m.
28. Town Hall Forum: Addiction Researchers With Their Own Lived Experiences of Addiction: Implications for the Science, the Scientists, and the Public

Chair: Noel Vest, Stanford University School of Medicine
Co-Chair: Kirsten Smith, National Institute on Drug Abuse, Intramural Research Program

Abstract: Individual perspectives are almost inevitably shaped through salient life experiences. This is particularly true for people who have experienced substance use disorder (SUD). People with SUD histories may be inherently inclined to use experiential knowledge to benefit others. This includes direct peer/clinical service but also, increasingly, scientific careers. Addiction researchers with lived addiction experiences exist in unknown, but likely non-trivial numbers. Yet their experiences typically remain undisclosed to their colleagues, mentors, and mentees. So, too, do the voices of researchers who have experienced family and community addiction. This is significant given the slow progress in developing a science of addiction that accounts for and addresses its complex and diverse realities. Can strides in scientific inquiry and policy be made from greater inclusion of and investment in researchers with addiction histories? Can these researchers serve as bridges to clinicians and laypeople, helping implement and disseminate evidence-based interventions (e.g., educate reluctant providers about opioid agonist therapies)? What can be done to mitigate the risks of disclosing addiction histories, especially for people with any of the multiple intersecting identities/histories that are additionally stigmatized or marginalized? Is drawing from the phenomenology of addiction and recovery/remission a potential epistemological threat (e.g., bias) or potential epistemological tool (e.g., critical consideration of information not otherwise readily attainable)? This forum aims to address these and related questions. Talks will be bookended by an introduction and chair-moderated discussion. To appeal to a wide audience, the panel includes addiction researchers ranging in personal and professional experiences and interests.

28.1 Can Researchers With Lived Experience of Addiction Help Promote Evidence-Based Interventions in Peer-Led Recovery?

Samuel Stull, The Pennsylvania State University

28.2 The Experiences of a Researcher With a Personal History of Family Addiction and Homelessness in Working Across the Epistemological Chasm Between "Researchers" and Those With Lived Experience

H. Harrington Cleveland, Penn State University

28.3 How Personal and Community Relationships With Individuals That Use and Distribute Legal and Illegal Substances Can Improve Our Research Methods and Assessments

Monica Faulkner, National Institute of Health/NIDA

28.4 Hidden Behind a Lab Coat: How Lived Experience With Heroin Addiction and Nearly a Decade of 12-Step Experience Inform and Inspire Bench Research in a Preclinical Setting

Devin Effinger, University of North Carolina at Chapel Hill

Discussant: David Epstein, NIDA Intramural Research Program

11:30 a.m. - 12:30 p.m.

29. Workshop: Supporting Our Healers: Providing Culturally Informed Support for Behavioral Health Professionals in Native Communities

Chair: Anne Skinstad, University of Iowa

Abstract: The Native Center for Behavioral Health (NCBH) is a research center at the University of Iowa College of Public Health committed to developing programs to support the behavioral health workforce in American Indian and Alaska Native (AI/AN) communities. Current projects include three technology transfer centers funded by SAMHSA: addiction (ATTC), mental health (MHTTC), and prevention (PTTC). The center also hosts an annual Leadership Academy, a workforce development program for AI/AN behavioral health professionals. NCBH develops culturally adapted resources and trainings for providers working with Natives.

This workshop will address culturally informed programs, resources, and assessments developed by NCBH. The University of Miami Comprehensive Drug Research Center will present results of national needs assessments that were conducted over a two-year period (February 2019- February 2021), including data about workforce development needs because of COVID-19. The goal of our weekly Listening Sessions following the pandemic, was to listen to needs of behavioral health workers who are providing a wide variety of services to Natives. Needs assessments have focused on the challenges of working within American Indian Tribal and Urban Indian communities, how to best serve Native populations, the COVID 19 pandemic, and how to incorporate culture/tradition into prevention and behavioral health services. Results illustrated a shortage of Native behavioral health professionals, a lack of Native evidence-based programming and services, a lack of integration of evidence based and cultural practices, and a need for greater understanding of Native cultural/knowledge based, and experience-based practices.

29.1 Conducting Evaluations for Native Populations
Clyde McCoy, Comprehensive Drug Research Center
29.2 Reaching Providers - Conducting National Needs Assessments for Providers Working With Native Communities
Noah Segal, University of Iowa, Native Center for Behavioral Health
29.3 K-12 During the Time of COVID-19
Teresa Brewington, University of Iowa
29.4 Challenges and Strategies for Evaluation and Needs Assessments in Native Populations
Korrine Rodrigue, University of Miami

11:30 a.m. - 12:30 p.m.
30. Symposium: Promising New Tobacco Cessation Treatments

Chair: Evan Herrmann, NIDA
Abstract: Released in January 2020, "Smoking Cessation: A Report of the Surgeon General" comprehensively reviews smoking cessation research from 1990-2019. Among its conclusions, this report determined that existing FDA-approved treatments (NRT, bupropion, varenicline) are safe and efficacious but drastically underutilized, with various factors limiting their appeal, reach, and effectiveness. This symposium highlights four promising new smoking cessation treatments with potential to overcome these limitations and increase overall cessation rates: 1) Dr. Sherry McKee (Yale) will present human laboratory and clinical trial findings on guanfacine, a repurposed α2A noradrenergic agonist, 2) Dr. Cindy Jacobs (Achieve Life Sciences) will provide an overview of clinical research and Phase 3 development of Cytisinicline, a nicotinic acetylcholine receptor partial agonist, 3) Dr. Matthew Johnson (Johns Hopkins) will present on psilocybin, a 5-HT2A agonist, including new Phase 2 data from an ongoing comparative efficacy trial vs. nicotine patch, and 4) Dr. Abraham Zangen (Ben-Gurion University/BrainsWay) will present on a recently FDA authorized deep-brain repetitive transcranial magnetic stimulation treatment. Dr. Celia Winchell (Center for Drug Evaluation Research, FDA) will serve as discussant, providing an overview of the FDA's role in smoking cessation medications development and approval processes. Drs. Evan Herrmann and Kevin Walton (Division of Therapeutics and Medical Consequences, NIDA) will serve as symposium chair and co-chair, respectively. These scientifically diverse talks focus on new data spanning multiple Phases of development, providing researchers and clinicians with cutting-edge information on promising new smoking cessation treatments and broader insights into treatment development and regulatory processes.

30.1 Promising New Tobacco Cessation Treatments
Kevin Walton, National Institute on Drug Abuse, National Institutes of Health
30.2 Examining Guanfacine, an Alpha2a Noradrenergic Target for Smoking Cessation
Sherry McKee, Yale School of Medicine
30.3 Cytisinicline for Smoking Cessation
Cindy Jacobs, Achieve Life Sciences
30.4 Psilocybin for Smoking Cessation
Matthew Johnson, Johns Hopkins University School of Medicine
30.5 Smoking Cessation Induced by Deep Repetitive Transcranial Magnetic Stimulation of the Prefrontal and Insular Cortices
Abraham Zangen, Ben Gurion University
30.6 The FDA's Role in the Development, Evaluation, and Approval of New Treatments
Celia Winchell, Center for Drug Evaluation and Research, US Food and Drug Administration

11:30 a.m. - 12:30 p.m.
31. Workshop: Beyond Case-Control: The Benefits of Dense Sampling in Addiction Research

Abstract: In light of growing concerns regarding reproducibility, the field of addiction research is increasingly focused on big data science initiatives. There are two main types of "big data": (i) research with large numbers of participants (i.e., population-level initiatives such as ABCD), and (ii) research designs consisting of large numbers of measurements per participant over timescales of minutes, days, weeks and months (i.e., dense-sampling).

Substance use is fundamentally episodic, and addiction is often conceptualized as a recurring cycle of binge/intoxication, withdrawal/negative affect, and preoccupation/anticipation states. Given the time-varying nature of substance use and associated states, it is extremely challenging to fully characterize all of the elements that contribute to an individual's substance use behavior with a single assessment. Dense sampling has great promise for providing a deeper characterization of clinical and neurobiological factors that contribute to substance use behavior. Broadly, these methods have been increasingly implemented to yield novel insights that complement traditional case-control designs. This symposium will highlight the utility of dense sampling for studying addiction and showcase research illustrating its application to elucidate how dynamic changes in clinical and neurobiological factors relate to substance use behavior across time. Speakers will present (i) the rationale and key considerations for applying dense sampling to the study of addiction, (ii) data using daily diaries of substance use and key symptom domains to elucidate longitudinal relationships between patterns of cannabis use and sleep, pain and depressive symptoms, and (iii) research using repeated fMRI measures to capture functional connectivity associated with smoking lapses.

31.1 Introduction to Dense Sampling in Addiction Research: Why, When, and How
Sarah Lichenstein, Yale University School of Medicine

31.2 Shared Trajectories and Daily Associations Between Marijuana Use and Reported Sleep Quality in New Medical Marijuana Card Holders
Brenden Tervo-Clemmens, Harvard Medical School, Massachusetts General Hospital

31.3 An In-Scanner Smoking Lapse Paradigm to Examine the Time-Varying Neural Correlates of Lapses
David Lydon-Staley, University of Pennsylvania

12:30 p.m. - 1:30 p.m.

32. Symposium: Cannabis and Cannabinoids: Variables That Impact Risk

Chair: Conor Murray, The University of Chicago

Abstract: Over the past two decades, cannabis and cannabinoid products have become increasingly legalized for medical and recreational use in the United States and in countries around the world. To meet the demand for data related to both therapeutic and adverse effects of cannabis exposure, researchers have begun to identify variables that may help prevent hazardous use and maximize potential medical benefits. Our proposed translational symposium addresses hypothesized variables that either protect against or increase risk of cannabis and cannabinoid products. These variables lie within both the complex nature of cannabinoid products and in the individuals that use these products for medical or personal use. Our panel will explore the impact of cannabis constituents (THC, CBD, terpenes) on adverse and potentially therapeutic subjective, behavioral, and physiological effects in human controlled studies. In addition, preclinical and clinical studies will highlight major variables between individuals, including the roles of sex and age on resultant effects. Finally, the discussion ties together the presented findings from preclinical and clinical studies from an epidemiological perspective, relating our work in the laboratory to use patterns in the population.

32.1 Introduction to Cannabis and Cannabinoids: Variables That Impact Risk
Ziva Cooper, UCLA Cannabis Research Initiative

32.2 Adolescent THC Exposure: Long-Term Effects on Pain, Anxiety, and Appetite in Rats
Rebecca Craft, Washington State University

32.3 Cannabis and Youth: Acute Effects of THC on Young Men and Women
Conor Murray, The University of Chicago

32.4 Individual and Interactive Effects of THC and Terpenes in Humans
Tory Spindle, Johns Hopkins University School of Medicine

32.5 CBD for THC and Opioid Sparing Effects in Humans
Caroline Arout, Columbia University Medical Center

32.6 Cannabis and Cannabinoids: Variables That Impact Risk
Deborah Hasin, Columbia University

12:30 p.m. - 1:30 p.m.

33. Workshop: Novel Approaches to Remote and Real Time Epidemiologic Assessment - Lessons From a Pandemic and Beyond

Chair: Heather Kimmel, National Institute of Drug Abuse, National Institutes of Health

Abstract: The ability to estimate, predict, prevent, and treat disease is dependent upon the collection of data. Barriers to timely data preceded COVID-19, and the pandemic has amplified limitations of collecting data through traditional (i.e., face to face) methods. This symposium is comprised of experts who have been successful in implementing or transitioning to novel methods of survey and biological data collection remotely and can identify the challenges and needs that still exist as we move towards real time data collection. The speakers will discuss the barriers and strategies for (1) transitioning to non-face-to-face data collection and (2) ensuring the data and related information are timely and available for greatest public health impact. We will discuss experiences and strategies related to large-scale data collection, collection of data from specific subgroups including vulnerable and hard-to-reach populations, and collections of various types of data including survey instruments, biological samples, physiological measures, etc. We will also discuss how to leverage other datasets including environmental health data, policy information, and crime statistics to provide a more comprehensive overview of the relationships between public health, social and environmental factors, and policy. However, in order to address major public health issues effectively, we also need to be able to share and disseminate scientific findings to a wide variety of stakeholders clearly and in a timely fashion.

33.1 Novel Approaches to Remote and Real Time Epidemiologic Assessment - Lessons From a Pandemic and Beyond

Elizabeth Hair, Truth Initiative

33.2 "Monitoring the Future" and Electronic, Remote Data Collection

Richard Miech, University of Michigan, Institute for Social Research

33.3 Making Pandemic Lemons Into Lemonade: Novel Methods for Remote Biobehavioral Assessment in Pregnant Women, New Mothers and Infants

Moriah Thomason, Department of Child and Adolescent Psychiatry, NYU Langone

33.4 Novel Approaches to Biobehavioral Data Collection When (Fully) in Person Collection is Impossible

Brian Mustanski, Northwestern University Feinberg School of Medicine

33.5 Approaches to Remote and Real Time Epidemiologic Assessment With American Indian Populations: A Tribal Epidemiology Center Perspective

Amruta Dixit, Albuquerque Area Indian Health Board, Inc.

33.6 Novel Approaches to Remote and Real Time EPI Assessment

Linda Cottler, University of Florida

12:30 p.m. - 1:30 p.m.

34. Workshop: Ethical and Practical Considerations of Clinical Research With Sensitive Populations in the Age of Electronic Health Records

Chair: Alison Oliveto, University of Arkansas for Medical Sciences

Abstract: The College on Problems of Drug Dependence (CPDD) Human Research Committee presents a workshop designed to educate and empower researchers about a potential threat to clinical research in sensitive populations, including substance users. Widespread adoption of integrated electronic health records and centralization of research resources have resulted in more institutional initiatives to conduct all clinical trials through the electronic health record (EHR). However, this poses potential ethical and practical dilemmas regarding privacy and recruitment of substance users into clinical research. For instance, EHRs currently cannot totally segregate research records, so participants' information will be available to providers outside the research protocol and accessible by outside agencies (e.g., insurance companies). To elucidate the scope of this issue for addiction researchers, we plan to administer a survey to CPDD membership in February of 2020 that covers current institutional practices regarding recruitment, tracking, and managing the conduct of clinical trials in sensitive populations. Results of this survey will be presented in this workshop. Content of the workshop will include the following: 1) historical context of privacy issues for research participants with substance use; 2) survey results regarding confidentiality of records and likelihood of research participation among those with substance use; and 3) survey results regarding current research privacy practices at CPDD member institutions and adverse events associated with different privacy practices. A panel of human subjects researchers will then discuss

strategies used to address institutional concerns, while ensuring adequate privacy protections. Audience participation in discussions will be encouraged.

Omayma Alshaarawy, Department of Family Medicine. Michigan State University College of Human Medicine.

34.1 Historical Context of Privacy Issues and Safeguards in Research Involving Sensitive Populations

Alison Oliveto, University of Arkansas for Medical Sciences

34.2 Impact of Certain Research Practices on Likelihood of Participation Among Opioid and Tobacco Users

Merideth Addicott, University of Arkansas for Medical Sciences

34.3 Survey Results Regarding Current Research Privacy Practices at CPDD Member Institutions and Adverse Events Associated With Different Privacy Practices

Omayma Alshaarawy, Department of Family Medicine. Michigan State University College of Human Medicine