

## Posters

### Poster 1: A 42-year-old Transgender Female with Sickle Cell Disease and Opioid Use Disorder: A Case Report

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**Background:** Sickle cell disease (SCD) is an autosomal recessive disorder (AR) causes an intrinsic defect of the red blood cell resulting in extravascular hemolysis of the sickle cells. The genetic defect causes point mutation with the substitution of valine for glutamic acid at 6th position of beta-globin chain of Hb. The defective HbS molecules aggregate and polymerize into long needle-like fibers when deoxygenated.<sup>1,6</sup> The hallmark clinical presentation of SCD is the vaso-occlusive crisis (VOC) or acute pain episode which can be manifested as early as 6 months of age, with multiple recurrences throughout the lifetime period. Other than acute pain episodes, several chronic pain conditions like arthritis, arthropathy, chronic leg ulcers, vertebral body collapse, avascular necrosis of the bone can emerge as complications of SCD.<sup>1</sup> Frequent acute pain episodes can be superimposed on chronic pain and can confound the situation at times. Neuropathic pain from nerve infarction, compression from bony structure collapse and iron overload neuropathy may also occur.<sup>1,4,5</sup> So pain management is always very challenging for the health care providers in the management of a case of SCD. Pharmacologic treatment for SCD associated pain syndromes includes NSAIDs, Acetaminophens, Opioids, and adjuvant medications.<sup>1,2,4</sup> As per the CDC, around 20% of patients presenting to physicians offices with acute or chronic pain related diagnoses other than cancer pain symptoms receive an opioid prescription.<sup>7</sup> According to NIH, misuse of, and addiction to prescribed opioids as pain relievers is becoming a national crisis that affects public health.<sup>8</sup> This situation is compounded by other primary psychiatric disorders and bio-psycho-social stressors.

**Methods:** Sickle Cell Disease (SCD) is a complex condition that affects the patient, patient's family, and relationship with the community and health care providers. A comprehensive health approach is warranted including multidisciplinary and subspecialty co-ordination. Educating patient, patient's family and community is an integral part of the management of SCD. It has been shown that acute pain episodes are mainly responsible for emergency visits and hospitalizations.<sup>3,9</sup> So a proper assessment and adequate treatment of the pain are necessary to provide a quality life to the patient. The focus of long term preventive home management is also to avoid emergency acute pain crises. Appropriate interventions of the pain crises during childhood help a patient to cope as adolescent and adult in the future. Chronic pain syndromes associated with SCD could be also debilitating both physically and psychologically as it involves sensation, cognition, emotion, and memory of the patient.<sup>1,3</sup> The major barriers of effective pain management in SCD are inadequate assessment of pain and risk of development of opioid intoxication, opioid withdrawal, opioid use disorder, and other opioid-induced disorders. Sometimes patients develop tolerance and physical dependence from chronic exogenous opioid exposure.<sup>9</sup> A proper understanding of pharmacologic dosage is needed to prevent such conditions and for adequate analgesia.<sup>2</sup> Psychological dependence may result in addiction or

pseudoaddiction which is largely influenced by genetic and psychosocial factors. Primary psychiatric disorders and other substance use disorders can complex the situation in a significant way.<sup>5</sup>

**Results: *Case Description:*** Ms. S, 42-year-old, Caribbean, single, unemployed, domiciled, transgender female admitted to the FHMC CDU with the chief complaint of having 'some issues' with the pain medications. According to the patient, she was diagnosed with Sickle cell anemia at the age of 4. She had multiple sickle cell crises in the form of acute chest syndrome and bone pain with hospitalization. Since then she had been treated with opioid analgesic (Oxycodone) for pain management. Patient stated that she started abusing her pain medicines 5 years ago. In 2011, she broke up with her boyfriend, of 5 years, as he could not accept her transgender issues. She got involved in different illegal activities and used her friend's credit card signature illegally and was accused of forgery. She lost the case and sentenced to Prison in December 2012 and released in 2013. She started abusing her medications after she was released. She was prescribed 30 mg/day and she was taking 200 mg/day of Oxycodone. Subsequently, she ended up in Addicts Rehabilitation Center (ARC) New York, Harlem. During her rehabilitation, she developed sickle cell crisis and was transferred from ARC to Harlem Hospital Center for management. More recently, she stated that in July 2018, she went to St. John's Riverside Hospital for Detox. From there, she was transferred to Queens General Hospital for management of anemia (low Hb) and ultimately ended up in CDU, FHMC. After correction of Hb and detox, she was transferred to Phelps Hospital for rehabilitation and was initiated on Suboxone therapy. She was admitted for 3 months and eventually signed herself out. On October 31, 2018, she went to St. Thomas. While there, she developed sickle cell crisis and returned back to the US. EMS brought her to NY Presbyterian, Queens for emergency management and from there she was transferred to FHMC CDU again. Patient stated the last time she misused Oxycodone was in September 2018, approximately 90 mg/day. She attempted to quit several times, but developed severe bone pain, diarrhea and vomiting and thus was unable to do so. On inquiry, the patient stated that she decided to change her gender at the age of 15, as "Living as a boy is not possible for me." She stated she was bullied in school for her name despite the name is "unisexual." She could not imagine growing up as a boy. Her mother, who was a police officer, was unable to cope with her decision and was unhappy with her choice. So the patient ran away from the home and ended up living in the streets. She got involved in several illegal activities in order to support herself. However, patient mother came to visit her all the time whenever she was admitted at the hospital due to Sickle cell Crisis. In 2010, she went to Washington DC and completed a Phlebotomy course and later moved to SC for a job. Regarding her past psychiatric history, patient endorsed she was impulsive, aggressive and easily angered when she was a child. Patient admitted that she stabbed one of her classmates with pencil when she was in the first grade and used to get into physical fights often in School. She admitted that she stabbed people multiple times, stating it was to "defend myself, as you know living as a transgender in this society is not easy." Patient reported that she only acted out when provoked in those instances. She denied any homicidal ideation or intent. She reports being diagnosed with Bipolar Disorder 8 years ago and was tried on several different medications, including Zoloft, Prozac, and Thorazine. However, she was noncompliant with Medications since 2010, because she did not believe that she had Bipolar Disorder. At the time of the interview, she reported feeling sad and anxious, stating, "I don't know how to deal with the pain and withdrawals." She felt tired as she believed her Hb was low. On query, she denied loss of hope, guilt, insomnia, loss of

appetite, loss of concentration, racing thoughts, excessive happiness, distractibility, paranoia, auditory or visual hallucination, and abnormal movement. She denied any previous suicide attempts or self-injurious behaviors. She experimented with cocaine, marijuana many years ago but last use was in 2013, stating-“it’s not my stuff,” and she did not like the taste/smell and the way she felt while on it. Patient was HIV positive, diagnosed at the age of 17, presented with swollen cervical lymph nodes and fatigue. Patient suspected she was infected during sexual encounters though she got multiple blood transfusions for SCD. Her maternal Grandmother had sickle cell anemia died in 2013. Patient was born in Queens, NY, raised by biological mother until age 15 when she ran away from home. She dropped out of school in the 10th grade and earned her GED. Initially, she worked as a construction worker, and then later as a Phlebotomist in 2010. On mental status examination, patient appeared stated age, maintained good eye contact, overweight, cooperative and engaged in the interview. There was no psychomotor agitation or retardation. The speech was normal in rate, rhythm, volume and content. She was anxious and affect was mood congruent, appropriate, and reactive. There was no delusion, no homicidal/suicidal ideation, intent or plan. Thought process was linear, coherent, organized, goal-directed. Her sensorium was intact. She was alert, awake and oriented to time, place and person. Her attention, concentration, memory were intact. Impulse control was good at the time of interview. Insight and judgment were good. Working diagnoses include Opioid use disorder, Borderline personality disorder, Gender Dysphoria, Sickle Cell Disease with multiple sickle pain crises and positive HIV status. Patient was treated with Methadone taper protocol which she tolerated well. Patient was offered and educated on Methadone maintenance treatment, Suboxone and Naltrexone therapy. Patient acknowledged and verbalized her understandings. Patient would continue the hormone therapy for her gender dysphoria and would do reconstruction surgery when ready. Regarding SCD and pain crises Hematology consultation was made and treated accordingly.

**Conclusions:** It is obvious from the above-mentioned case that multiple stressors played a significant role in the development of opioid use disorder in the patient. Patient’s borderline personality, gender dysphoria, positive HIV status; all are responsible in many ways to make the patient prone to misuse of opioids and subsequently development of opioid dependence and withdrawal syndrome. But we need to keep in mind that the primary diagnosis of the patient was SCD with multiple sickle pain crises. An individual targeted, optimum pain management can alleviate the sufferings of the patient and his/her surroundings in a larger amount. Though opioid still remains the first choice of options treating the acute and chronic pain in SCD, but optimizing benefits and minimizing adverse effects of chronic opioid therapy are challenging.

**Summary:** Mechanism based target therapy should be considered for pain management in sickle cell disease. The first approach should be the development of disease modifying agents that target sickle pathobiology of the pain. The second approach is to use non-opioid analgesics that target the CNS.<sup>2</sup> Multiple studies and clinical trials are going on the development of disease-modifying agents targeting the components of pain pathology in SCD and mechanism of action of opioid analgesic. Though pain is a subjective experience proper assessment of an acute pain episode, reassessment after the initial therapy and a comprehensive assessment of chronic pain are warranted to avoid unnecessary use of opioids.<sup>1</sup> Use of a standardized pain assessment tool and ‘opioid risk tool’ are necessary before starting

opioid therapy. Educating patients and family members about the pain and prophylactic use of Hydroxyurea to reduce the frequency of acute pain episodes can play an important role in the management of SCD. Beside non-opioid analgesics other adjuvant therapies including anxiolytics, anticonvulsants, clonidine, antidepressants can be used to reduce opioid burden as it is evident that emotional stresses involving autonomic nervous system can contribute to VOCs.<sup>6</sup> Non-pharmacological integrative interventions like acupuncture, dietary supplements, cognitive behavioral therapies are also being used to minimize the complications of long-term opioid use. In the end, SCD is incurable unless bone marrow transplantation. So psychosocial aspects confronting the patients, families, healthcare providers, and the community should be addressed minutely and patients must be assured that pain management will be optimal and individualized.

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**Funding Sources:** None

## Poster 2: A Case of an Impaired Physician with Alcohol Use Disorder and Multiple Medical Comorbidities

**Pantea Farahmand, MD**, *Boston Medical Center*; **Michael Hsu, MD**, *Brigham and Women's Hospital*; **Joji Suzuki, MD**, *Brigham and Women's Hospital*

**Background:** This is a case of a former physician with a complex medical history including sick sinus syndrome, congenital long QT syndrome, recurrent bilateral pulmonary embolisms, autonomic dysfunction of unknown etiology, and suspected posterior reversible encephalopathy syndrome (PRES). She has a psychiatric history of alcohol use disorder severe, major depressive disorder, borderline personality disorder, and generalized anxiety disorder for which she is on chronic benzodiazepines (klonopin and lorazepam). She presented to a large Boston hospital with worsening light-headedness, vomiting, and diarrhea complicated by falls. Addiction Psychiatry was consulted for recommendations for a rapid benzodiazepine taper. There are three educational objectives that are highlighted by this case including providing substance use treatment for an impaired medical professional, providing substance use treatment in a medical setting, and psycho-medical considerations when tapering benzodiazepines.

**Methods:** This is a case report in which consent was obtained from the patient.

**Results:** There are several specific considerations that are unique to providing substance use treatment to a medical professional. There are risks of overlapping professional circles outside of treatment, mandated reporting considerations, etc. While evidence supported substance use treatments have been adapted to physician-patients—12-step programs and motivational interviewing—there are also specific transference-countertransference issues that practitioners treating the physician-patient. Having an addictions consultation service in the medical setting allows increased access to substance use treatment and reduction in medical risks associated with a substance use disorder. However, the novelty of the service requires psychoeducation of providers and staff on effective treatments for substance use disorders. In this case the addictions service's recommendations of a slow outpatient-monitored benzodiazepine taper was counter intuitive to the medical service's goal of a rapid benzodiazepine taper.

**Conclusions:** Rates of substance and alcohol use among medical professionals are comparable to the general population. However, treatment of the impaired physician has unique challenges that are highlighted in this case.

**Summary:** This a case to be presented in a poster. It has implications for clinical practice and education in that it explores substance use treatment for an impaired medical professional, providing substance use treatment in a medical setting, and psycho-medical considerations when tapering benzodiazepines.

**Funding Sources:** None

### Poster 3: A Case of Chronic Alcoholism and Psychosis

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**Background:** Cerebellar cognitive affective syndrome (CCAS) is characterized by impairments of executive function, spatial organization, linguistic processing and affect regulation that can be attributed to a cerebellar pathology. Chronic alcohol use has been shown to cause generalized cerebellar degeneration, however there is a no literature describing cerebellar cognitive and emotional impairments in individuals with a history of chronic alcohol use.

**Methods:** Clinical data was collected during an eleven-day hospitalization at an academic medical center. A PubMed literature search was performed to identify existing data on the link between chronic alcohol use, cerebellar degeneration and the development CCAS.

**Results:** The patient is a 32-year-old man with alcohol use disorder who presented with new onset psychosis and radiologic evidence of cerebellar degeneration. The patient was initially treated for Wernicke's encephalopathy but also demonstrated remarkable affect dysregulation, ornate visual hallucinations and paranoia. His hallucinations subsided with antipsychotic medications, but he remained delusional and demonstrated cognitive and affective deficits in 10/10 domains assessed by the CCAS scale throughout the hospital stay.

**Conclusions:** This case may present an example of CCAS induced by chronic alcoholism. Given the high prevalence of alcohol use disorder in the US population, it is possible that this syndrome may be under recognized, though such changes in behavior may have devastating consequences on psychosocial functioning.

**Summary:** More work should be done to try and identify the connection between CCAS and chronic alcoholism if it exists. This may help identify such cases for timely treatment and care coordination.

**Funding Sources:** None

## Poster 4: A118G mu Opioid Receptor Polymorphism in Tramadol Dependent and Tramadol Induced Psychosis. A study on an Egyptian sample.

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**Background:** According to the latest National Addiction Survey in Egypt, tramadol addiction is one of the most prevalent Substance Use Disorder. The association between single nucleotide polymorphism (SNP) A118G of Opioid receptor mu 1 (OPRM1) gene and tramadol addiction varies among populations. However, it has not been studied yet in the Egyptian population. Previous studies have revealed that tramadol is one of the leading causes of Drug Induced Psychosis (DIP) in Egypt. The underlying mechanisms, whether genetic or environmental, have not been established yet. The study examines:- (1) the association between A118G genotypes and tramadol dependent patients (2) risk factors for tramadol dependence in Egypt including demographic data, A118G genotype, tramadol pattern of abuse and patient's personality profile. The association between tramadol induced psychosis and A118G genotype is to be studied.

**Methods:** The present descriptive cross-sectional study has been conducted at the outpatient clinic of Neuropsychiatry department, Menoufia University hospital and Shebin Elkom Hospital of Mental Health on two groups of patients. It reported regular tramadol use in the past 12 months (20- 50 years). Diagnosis is confirmed through structured clinical interview for DSM-IV axis 1 disorders (SCID- 1). The patients studied are two groups :- group (1) diagnosed as tramadol dependent (no= 20) and group (2) diagnosed as tramadol induced psychosis (no=20). The healthy control group (no=20) matched with age and sex has been compared with the previous groups of patients as regards: demographic data, A118G genotype, personality profile which is measured by Arabic version of temperament and character inventory-Revised (TCI -R) and tramadol pattern of use assessed by 33 items from semistructured interview sheet of the Institute of psychiatry, Ain Shams University hospital, Egypt. A multivariate logistic regression for tramadol dependence group was performed to explore the risk factors among demographic data, patterns of tramadol use, genotyping and personality profiles.

**Results:** Results indicate that GG genotype percentage was significantly higher in tramadol dependent group than the healthy control group (35%, 10%), respectively ( $p < 0.05$ ). Multiple logistic regression among tramadol dependent patients group determine greater endorsement on low socioeconomic status, OPRM1 gene, GG genotype and Novelty seeking as risk factors for tramadol dependence in the Egyptian sample studied. However, there is no significant association between GG genotype and tramadol induced psychosis to emphasize the importance of acquired environmental factors compared to genetic factors with their implications in the assessment, prevention and treatment of drug induced psychosis.

**Conclusions:** Genotyping revealed significant association between GG genotype of the OPRM1 gene and tramadol dependence in the Egyptian population studied. This has an impact on the characteristics of tramadol use. Risk factors assessment among the group studied would result in better assessment, prevention and treatment strategies. Personality profile of the tramadol dependent participants studied

determine novelty seeking as a significant factor for tramadol dependence which can be used for early detection and better strategies for tramadol dependence and prevention of Substance Use Disorders(SUDs)

**Summary:** The study signifies the neurobiological basis of tramadol dependence on an Egyptian sample. It assesses the common clinical characteristics of tramadol use disorder together with the predisposing personality profiles in Egypt. The results implement new policies in Strategic action plans in the field of tramadol dependence by better prevention, assessment and treatment. Meanwhile, it signifies the environmental factors in tramadol induced psychosis in Egypt.

**Funding Sources:** None



## Poster 5: Abuse, Toxicology and The Resurgence of Propylhexedrine: A Review

**Nikhil Teja, MD**, *Dartmouth-Hitchcock Medical Center*; **Cornel Stanciu, MD**, *Dartmouth-Hitchcock Medical Center*

**Background:** Propylhexedrine, the active ingredient in over-the-counter nasal decongestant Benzedrex, carries significant abuse potential and health risks. Propylhexedrine replaced the highly abusable amphetamine sulfate as the active ingredient in Benzedrex in 1949, however its abuse presents a novel constellation of concerns. While much of the literature surrounding its abuse comes from the 1970s and 1980s, we have encountered several cases of psychosis resulting from its abuse. Awareness of the hazards associated with this medication should be of interest to both physicians and legislators. Given the relative paucity of recent literature, in addition to reviewing the current literature, we supplement our review of Propylhexedrine abuse by drawing from online user forums. Propylhexedrine is only available in the United States in inhalers for the relief of nasal congestion due to colds, allergic rhinitis and sinusitis under the trade name Benzedrex® (Smith 1998). In Europe, propylhexedrine is available in an oral form marketed as an anorectic (Obesin) (Wesson 1986). Initially regarded as a substance of low abuse potential, it replaced amphetamine sulfate as the active ingredient in nasal decongestant Benzedrex, reducing airway resistance without rebound congestion seen with other products on the market (Wesson 1986). Structurally similar to amphetamine, propylhexedrine found in nasal decongestant inhalers is racemic, with the laevorotary isomer acting as the predominant releaser of nor-epinephrine and dopamine in the central nervous system (Fernandez 2012). Propylhexedrine abuse was first identified in the literature in 1970 in New Zealand in a case involving acute psychosis reminiscent of amphetamine psychosis (Anderson 1970). Numerous case reports emerged in the American literature in the 1970s and 1980s, and while there was a relative surge in cocaine and methamphetamine use during this period, Smith et. Al 1988 did not find an increase in its abuse during this period after studying surveying data from several major metropolitan areas. In the 1990s and 2000s there was a single published case report involving death from intravenous injection, although online user forums suggest propylhexedrine abuse still persisted. Propylhexedrine toxicity case reports returned to the literature in 2011 with a fatality involving its combination with Mitagryine (an active agent in Kratom) (Holler 2011). There have been no studies into the prevalence of recent Benzedrex abuse. Given the cases seen at New Hampshire Hospital, case reports in 2011 and 2012, as well as our review of online user forums, Propylhexedrine abuse may be on the rise and its classification as a Class IV substance with no restrictions on bulk purchases should be revisited (Fernandez 2012).

**Methods:** This poster presentation utilizes a combination of literature review using major biomedical library databases (including PubMed, Scopus, and Cochrane) online user forum data (Erowid, Bluelight and Reddit), and brief presentation of 2 case reports (Dr. Stanciu) to present current available information on Propylhexedrine (Benzedrex) abuse.

**Results:** There is a paucity of studies and case reports (28) addressing Propylhexedrine misuse, the primary findings which are summarised in the poster. There is no published data on incidence of Propylhexedrine misuse. This lack of academically reliable information motivated exploration of user

forums for information regarding subjective user effects, doses and patterns of use and acquisition. A compilation of subjective user effects and adverse reactions is presented.

**Conclusions:** There are numerous case studies and reports of the dangers associated with propylhexedrine abuse. Despite its ready availability and extensive user forums discussing its abuse potential, this seemingly innocuous substance's darker side is rarely covered in medical education and appears largely unregulated, and policy makers should be aware of the threat it poses.

**Summary:** Poster presentation on Propylhexedrine abuse that draws from traditional medical literature as well as online user forums to bring awareness to physicians treating stimulant use disorders as well policy makers.

**Funding Sources:** None

## Poster 6: Acute Psychiatric Hospitalization as an Opportunity to Initiate Buprenorphine Treatment

**Matthew Mosquera, MD, *Partners HealthCare*; Joji Suzuki, MD, *Partners HealthCare***

**Background:** In the year 2017, 47,600 people in America died from opioid overdose, an increase from 42,00 overdose deaths in 2016 and 33,901 in 2015. Buried within this alarming trend, is the lesser talked about detail that an unknown percentage of the overdose deaths are in fact suicides. A 2004 meta-analysis demonstrated that individuals with opioid use disorder (OUD) are associated with a more than 13-fold increased risk for suicide death when compared with the general population. Occurring in tandem with the opioid crisis, is the mental health crisis in America, specifically increased suicide rates and inpatient hospitalization rates. According to CDC, during the 16-year period from 2001 to 2017, the total suicide rate increased 31%, and from 2005 to 2014, the total number of inpatient hospital stays for mental health/substance use conditions rose 12.2%. Pulling these two crises together, OUD and depression have high co-morbidity rates, and multiple studies have shown that buprenorphine not only reduces overdose and all-cause mortality in individuals with OUD, but has also demonstrated efficacy in the reduction of depressive symptoms and suicidal ideation. However, buprenorphine initiation can be difficult, as withdrawal symptoms can be easily precipitated, especially when transferring from methadone, and success rates improve with close monitoring for control of withdrawal symptoms. Considering this challenge, inpatient psychiatric admissions represent an underutilized opportunity for buprenorphine initiation for treatment of opioid use disorder, especially in the setting of co-morbid depression and/or suicidal ideation.

**Methods:** We present a case of buprenorphine initiation during an acute inpatient psychiatric hospitalization for depression and persistent suicidal ideation. The patient was a 29-year-old Caucasian homeless woman with high risk social history (victim of sex trafficking and multiple sexual assaults) and a psychiatric history notable for depression, anxiety, PTSD, multiple prior suicide attempts, cocaine use disorder, and opioid use disorder with ongoing significant intravenous heroin use while on methadone, who presented to the emergency department in the setting of a suicide attempt after intentional overdose of her prescribed clonidine medication. The patient was admitted to the medicine floor for stabilization, and then transferred to the inpatient psychiatric unit for elevated risk of self-harm in the setting of active suicidal ideation and worsening depressive symptoms. Upon admission to the inpatient psychiatric unit, patient expressed a strong desire in transitioning to buprenorphine for treatment of opioid use disorder. She had previously been on buprenorphine with good effect that she described as superior to methadone (especially with craving reduction), and reported strong preference to resume buprenorphine with a goal for sobriety from heroin and reduction in both symptoms of depression and suicidal ideation. She also identified the inpatient psychiatric unit as the ideal setting for the transition from methadone to buprenorphine for multiple reasons, first and foremost, the ability to carefully monitor for and treat withdrawal symptoms, and also due to her dissatisfaction with previous initiations on detoxification units and in the outpatient setting because of inadequate instruction/oversight and poor withdrawal symptoms management. In order to transition from high-dose methadone to buprenorphine, oxycodone and ancillary medications were utilized as bridging treatment.

Additional psychiatric history notable for 4 prior inpatient psychiatric hospitalizations (previously for suicide attempt via prazosin overdose, suicidal ideation, and benzodiazepine withdrawal), multiple prior suicide attempts (each by overdose of prescribed medication), and previous diagnoses of major depressive disorder, PTSD, unspecified anxiety disorder, opioid use disorder, cocaine use disorder, benzodiazepine use disorder. Substance Use History notable for daily intravenous heroin use (about 1g per day) in addition to daily methadone, frequent IV and intranasal cocaine use (about ~\$400 per day), and history of illicit benzodiazepine (denied supplemental use on top of prescribed clonazepam). Social history notable for main source of income via sex work and history of frequent sexual assaults by her pimp (patient presented to the hospital “on the run” from her pimp, requesting admission under an alias and visitors restricted), unstable housing (patient identified as being homeless), and significant lack of psychosocial supports in her local area (patient’s described her parents as supportive and currently with custody of her 8-year-old son, but living remotely in another state). Legal History notable for prior 30-day incarceration for substance use related charge in 2015 (during which time patient’s home methadone medication was discontinued and she was provided no ancillary medications for withdrawal symptoms). We also summarize the relevant points from a PubMed literature search on available resources for transition from methadone to buprenorphine as well as existing data for buprenorphine initiations on inpatient psychiatric units.

**Results:** During an acute inpatient hospitalization to psychiatric unit, a patient was successfully transitioned from high dose methadone to buprenorphine/naloxone treatment for opioid use disorder using oxycodone and ancillary medications as bridging treatment. Additional indications for initiation of buprenorphine included worsening depressive symptoms and suicidal ideation. Details of the buprenorphine initiation and transition from methadone went as follows, on the morning of admission to the psychiatric unit, the patient’s methadone was discontinued. She was started on scheduled oral oxycodone 15mg every 3 hours with additional 5mg available as needed every 3 hours. As far as ancillary medications for withdrawal symptom management, she was started on loperamide (2-4mg PO Q8hrs PRN) for diarrhea, ondansetron (4-8mg PO Q8hrs PRN) and promethazine (25mg PO Q6hrs PRN) for nausea, ibuprofen (600mg PO Q6hrs PRN), dicyclomine (20mg PO Q4hrs PRN) for abdominal cramping, diphenhydramine (50mg PO Q8hrs PRN) for nasal congestion and insomnia, methocarbamol (750mg PO Q6hrs PRN) for muscle cramps, and hydroxyzine (50mg PO Q6hrs PRN) for anxiety. As needed clonidine (0.1mg PO Q8hrs PRN) was restarted on day 7 per patient request for management of anxiety. Her total daily dose of oxycodone on day 1 was 90mg and 120mg on days 2 and 3. On day 4, the patient’s initial clinical opiate withdrawal score (COWS) was recorded as 10 with moderate symptoms of opioid withdrawal, in response her scheduled dose of oxycodone was increased from 15mg to 20mg. On day 5, the patient’s COWS score was recorded as 9 and although there was no significant drop in COWS score following the dosage increase, the patient reported experiencing reduced withdrawal symptoms, felt comfortable with the scheduled dosing, and acknowledged the availability of additional 5mg as needed. Of note, patient utilized as needed oxycodone 5mg doses only three times during the 10-day bridge period, once on day 6, and twice on day 10. From days 5 to 10, the patient received 20mg of oxycodone at regularly scheduled 3 hours intervals. On the morning of day 10, the patient’s COWS was 8 and the decision was made by patient and treatment team to proceed with buprenorphine the following morning. This decision was based on the patient’s preference and

understanding of her withdrawal symptoms given previous inductions, as well as a stable COWS. All oxycodone medication was discontinued after 10pm the night of day 10. On the morning of induction, day 11 post discontinuation of methadone, COWS was 14, and she was dosed with 4 mg/1 mg of buprenorphine/naloxone sublingual. At 1-hour post initial induction dose, her repeat COWS was 6, and an additional 4mg/1mg dose was provided 1 hour later. At 4-hour intervals thereafter, she was given two additional doses of buprenorphine/naloxone at 4 mg/1 mg sublingual for a total daily dose of 16mg buprenorphine and reported good control of her withdrawal symptoms. For the remainder of her admission, days 12-20, patient was continued on 8mg/2 mg of buprenorphine/naloxone sublingual three times daily, for a total daily dose of 24mg buprenorphine. In terms of ancillary medications, the patient utilized most amount (both in terms of variety and frequency) during days 1-4, post methadone discontinuation, and during days 11-14, post buprenorphine induction. Her most frequently utilized medications, both before and after buprenorphine induction, were clonidine and promethazine. Following the successful buprenorphine induction patient was deemed appropriate for discharge by day 13; however, her discharge was delayed by challenges with aftercare planning. Patient required a new buprenorphine/naloxone prescriber, outpatient day program, and safe housing outside of reach from her pimp. Of note, throughout her time on the unit, the patient was admitted under pseudonym and her visitor list was restricted to her father only, who was required to show multiple forms of identification upon entry and exit of the unit. Eventually by day 20 of her admission, patient was discharged to a domestic violence shelter outside of city limits with dual diagnosis intensive outpatient program and local buprenorphine/naloxone prescriber. Based on a PubMed literature search as of May 2019, there are no published case reports involving the initiation of buprenorphine during inpatient psychiatric hospitalizations or studies demonstrating rates of buprenorphine initiation during inpatient psychiatric hospitalizations.

**Conclusions:** This case demonstrates that inpatient psychiatric hospitalizations represent an underutilized opportunity for buprenorphine initiation, given close monitoring and control of withdrawal symptoms, an ability that increases the likelihood of successful initiation, and also the high prevalence of co-morbid depression and/suicidal ideation which provides an additional indication for buprenorphine initiation. Additionally, initiation while on an inpatient unit, allows for management of complicating factors such as transition from high-dose methadone and high-risk social histories.

**Summary:** The combination of opioid and mental health crises in the United States have resulted in dramatic increases in opioid overdose deaths, suicide rates, and inpatient psychiatric hospitalizations. Patient with OUD have an extremely increased risk for suicide death given high likelihood for completion. OUD and depression have high co-morbidity rates, and in patients with OUD presenting to inpatient psychiatric units, this rate is likely even higher. Buprenorphine reduces overdose and all-cause mortality in OUD and has also demonstrated efficacy in the reduction of depressive symptoms including suicidal ideation. Little data exists on the rates of buprenorphine initiation during acute psychiatric hospitalizations. Inpatient psychiatric unit represent an ideal location for initiating buprenorphine given the ability for close monitoring and control of withdrawal symptoms, high prevalence of co-morbid depression, and capacity to manage complicating factors such as transition from methadone and high-risk social histories. The case presented demonstrates not only feasibility, but also the importance of

utilizing inpatient psychiatric hospitalizations to initiate buprenorphine and provide a life-saving treatment to patients in desperate need.

**Funding Sources:** None

## Poster 7: Addictions and Criminal Responsibility

**Stephanie Yarnell, MD, PhD, *Brown University***

**Background:** The criminal justice system and SUDs are intertwined. Drug-related incarcerations are a chief driver of the overall increased federal and state prison populations, which exploded from roughly 500,000 in 1980 to over 2.3 million- and carries significant social and financial costs to society. Outside of specific drug-related charges, substance use is also frequently involved in general criminal offenses. Research on state and federal prisoners demonstrated that half of all prisoners reported alcohol or drug use at the time of their first offense. Given these numbers, chances are you will have patients involved with the legal system. Yet, most physicians know surprisingly little about the way the legal system treats addiction. Using an actual forensic case, this presentation will discuss the role of addictions in the criminal justice system. Emphasis will be placed on exploring the legal view of addictions overtime through a review historical trends and landmark legal cases in the process. The presentation will end with discussing the role of addictions within the Not Guilty by Reason of Insanity plea. This presentation will invite participants to consider this information as it pertains to the case presentation, as well as utilizing strategically placed questions to encourage thought provoking conversation amongst participants.

**Methods:** Legal precedent was reviewed to determine older historical trends regarding how courts have viewed intoxication. Landmark legal cases were subsequently reviewed for cases of relevance to addictions and criminal responsibility.

**Results:** These cases were reviewed and distilled to pertinent take aways and points for discussion. Interesting moral and ethical considerations were highlighted and brought forth for the purposes of encouraging thought provoking discussion to help drive home the discussion. Emphasis was placed on the role of intoxication in criminal responsibility and culpability. At current, voluntary intoxication- and addiction more broadly- provide protection in only a narrow window of circumstances.

**Conclusions:** The role of intoxication within the legal system has a complex history, but the cases affect clinical practice and access to care. Given the high numbers of patients struggling with both substance use disorders and legal difficulties, it is imperative that physicians have a broader understanding of the role of addictions in criminal responsibility. Particular importance should be paid to understanding the limited circumstances in which addiction can be considered in court.

**Summary:** This poster will review historical trends and landmark cases involving substance use and criminal responsibility. These efforts will help provide education on a frequently misunderstood topic and help better prepare physicians to take part in advocacy and policy discussions around addictions in the court room- and help clinicians better advocate for legally involved patients.

**Funding Sources:** None

## Poster 8: Parenting in the Twenty-First Century: What is “Dangerous”?

**Stephanie Yarnell, MD, PhD.** *Brown University*; **Simha Ravven, MD,** *Yale University*

**Background:** Illinois was the first state to address the legal culpability of women who commit criminal acts during episodes of postpartum mental illness, and brings legislation more in line with the longstanding Infanticide Act of 1938. The Infanticide Act of 1938 is a UK law that allows consideration of a woman’s perinatal mental health in determining culpability. But is Illinois an anomaly or the first in what will become a growing trend? The cultural narrative in the United States around postpartum mental illness, a woman’s risk to her children’s health, and even how-to-parent is a complicated one with many controversial cases. Legal proceedings have stemmed from topics such as for fetal harm, abortion and fetal personhood statutes, substance use and pregnancy, environmental toxins, vaccination controversies, dietary restrictions, and even whether a child should be allowed to play outside. This presentation will discuss Illinois’ new legislation regarding the effects of postpartum mental illness on culpability, as well as specific, high-profile civil and criminal cases exploring what it means to be “dangerous” to a child’s health.

**Methods:** This presentation reviewed recent criminal and civil cases to determine so-called “high profile” cases that were extensively covered in the media. These cases were highlighted and actual news clippings along with brief descriptions of the stories were used to highlight themes. Conscious and unconscious beliefs about race, wealth (and poverty) and ideals and fantasies of motherhood are also explored in brief.

**Results:** Legal proceedings have stemmed from topics such as fetal harm, abortion and fetal personhood statutes, substance use and pregnancy, environmental toxins, vaccination controversies, dietary restrictions, and even whether a child should be allowed to play outside. Among common themes that emerged was the role of substance use in pregnancy.

**Conclusions:** This presentation discussed Illinois’ legislation regarding the effects of postpartum mental illness on culpability, as well as specific, high-profile civil and criminal cases exploring what it means to be “dangerous” to a child’s health. Through discussion of controversial cases, this poster highlights the changing social and legal standards for child harm and neglect and begs us to perform a more in-depth analysis of the assessment of risk in American parenthood, particularly motherhood. Despite the seemingly positive move by the Illinois legislature, there seems to be a strong trend toward prosecution of pregnant women for fetal harm and exposure to risk, including substance use.

**Summary:** This poster directly evaluates recent policy changes and moves on to explore the implications of recent civil and criminal cases across the nation. The outcomes of these cases determine case-law, which in turn affects the clinical practice and reporting standards. Thus, these cases are of paramount importance and the growing trends across the nation must be discussed.

**Funding Sources:** None



## Poster 9: An Exploratory Study of Drug Use Encounters by New York City Business Managers

**Miranda Greiner, MD**, *Weill Cornell Medicine - New York Presbyterian*; **Jonathan Avery, MD**, *Weill Cornell Medicine - New York Presbyterian*

**Background:** Opioid-involved overdoses in the United States have dramatically increased in recent years, largely due to a rise in synthetic opioids. Illicitly manufactured fentanyl and other synthetics are often mixed with heroin, cocaine, street pills marked as “Xanax” and other substances--with or without the user’s knowledge. Drug overdoses are occurring in broader settings than just business bathrooms with the rise in synthetics and counterfeit pills. Clubs and bars with recreational drug use are more vulnerable to public overdoses. Managers are often first-responders to drug overdoses by default, yet limited research has explored their experiences encountering drug use. This exploratory study examines the experiences by New York City business managers with drug encounters, paraphernalia, overdoses, and knowledge in overdose recognition and naloxone.

**Methods:** A survey instrument modeled from a previously implemented survey collected data on manager encounters with drug use occurring in business settings. The survey explored business managers’ encounters with drug use, paraphernalia, overdoses, activating emergency services for individuals, overdoses, and knowledge in overdose recognition and naloxone. Additionally, the survey gauged managers’ perspectives on increasing accessibility to naloxone training and rescue kits, and if they encountered overdoses outside of business settings. Recruitment was guided by convenience and purposive sampling.

**Results:** This study is ongoing and preliminary results reveal that all managers interviewed had encountered drug use in their businesses, more than half (56%) of these managers found drug paraphernalia, and a third (31%) of managers found syringes. A vast majority (81%) of managers activated emergency medical services for a drug encounter and half (50%) after finding individuals unresponsive. Monthly encounters of drug use ranged from none to fifty with a mode and average of 10 encounters. Few managers (13%) had received overdose recognition or naloxone training. All managers shared mutual interest in naloxone being widely available to businesses.

**Conclusions:** The preliminary results of this study indicate that local business managers in New York City are often encountering drug use and activating emergency medical services. There is a need for additional research and expanding overdose recognition and naloxone training to community stakeholders. Additional efforts must be considered amongst national-level stakeholders to combat the opioid crisis such as improved availability of naloxone rescue kits, test strips to detect synthetic opioids in substances, supervised injection facilities, drug consumption rooms, and other interventions reducing the high rates of overdose deaths.

**Summary:** New York City along with the rest of the nation has been experiencing a rise in opioid overdose deaths. Synthetic opioids are now found in counterfeit Xanax, ecstasy, cocaine, and even cannabis where individuals are overdosing unknowingly on synthetic opioids. This project address this

directly by training local business managers how to recognize an overdose and administer naloxone including in bar or club settings. Through this project, we hope to equip our local community with tools to combat opioid overdoses as well as draw awareness to the opioid epidemic and increase naloxone training to laypersons.

**Funding Sources:** None

## Poster 10: An Unlikely Case of Benztropine Misuse in an Elderly Schizophrenic – A Case Report

**Ulziibat Person, MD**, *Nassau University Medical Center*; **Michael Esang, MD, MPH**, *Nassau University Medical Center*; **Odeyuwa Izekor, MSIII**, *American University of the Caribbean School of Medicine*; **Sabina Goldstein MS 3**, *American University of the Caribbean School of Medicine*

**Background:** The prevalence of anticholinergic misuse has been reported as 34%, and occurs mostly in psychiatric patients (1, 2). It is frequently misused to induce a euphoric state and to enhance social skills (1, 2). Anticholinergics, however, increase the risk of bowel obstruction and urinary retention (3).

**Methods:** Literature review and case presentation.

**Results:** We present the case of a 67-year-old Black male with a history of chronic schizophrenia, an enlarged prostate, and essential hypertension. He has been receiving care for several years at the Outpatient Psychiatry Department at our institution and has been free of psychotic symptoms for over 10 years while on a monthly intramuscular injection of 50 mg of Haloperidol Decanoate. His extrapyramidal symptoms had also been controlled with oral Benztropine at 0.5 mg two times a day as needed. During the course of his treatment, he developed hematochezia along with lower abdominal pain, constipation, and difficulty with urination, which was initially attributed to his enlarged prostate. However, a careful history by his psychiatrist subsequently revealed his use of more Benztropine than he was being prescribed. He admitted to taking double his prescribed dose per day, and to taking increasing doses over a period of months, as he had also been receiving this prescription from his gastroenterologist. The psychiatrist then coordinated his care with his outpatient gastroenterologist and urologist. Extensive psychoeducation, over a period of multiple clinic visits, was provided to him on his increased susceptibility to the anticholinergic effects of Benztropine. It was explained that his advanced age and history of an enlarged prostate placed him at an elevated risk of anticholinergic complications. The Benztropine dose was reduced, and shorter duration prescriptions were provided to allow for increased vigilance, and the patient began to use the medication as prescribed. His gastroenterologist and urologist had both ruled out a malignant neoplasm as the etiology of his presentation. These symptoms gradually resolved and the patient continued to receive psychiatric care regularly at our clinic without any further incidents.

**Conclusions:** Anticholinergic drugs can act as potent indirect dopamine agonists (4) in the limbic system. This can explain their misuse potential in both psychiatric and non-psychiatric patients. Benztropine is a synthetic muscarinic-receptor antagonist that competes with acetylcholine at the muscarinic receptor site. Constipation is a minor side effect of haloperidol therapy because of its weak anticholinergic effect. When combined with anticholinergics, it can induce significant gastrointestinal hypomotility, constipation, and rarely paralytic ileus (5).

**Summary:** This case highlights the importance of obtaining a detailed history when previously stable psychiatric patients develop acute symptoms. It also illustrates the importance of coordination among care providers treating a patient and the central role of the psychiatrist in the care of patients with

psychiatric illnesses. Even in elderly patients with no prior substance use history, anticholinergic medications can be abused leading to adverse health outcomes if missed.

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**Funding Sources:** None

## Poster 12: Auto-Brewery Syndrome in a patient of Alcohol use disorder in remission, causing interrelationship problems

**Usman Ahmed, MD, MBA, Rutgers NJMS; Rashi Aggarwal, MD, Rutgers NJMS; Nadia Matin, MD, VA Medical Center, East Orange, NJ; Rabica Shahid, MD, Windsor University School of Medicine**

**Background:** Auto-Brewery syndrome (Gut fermentation syndrome or endogenous ethanol fermentation) is a rare disorder first described in the 1940s. The hallmark of this syndrome is evidence of alcohol intoxication without ingesting alcohol. Ethanol forms in the intestine through fermentation of consumed carbohydrates by yeast or bacteria. We discuss a patient with gut fermentation syndrome initially misdiagnosed with active alcohol use disorder.

**Methods:** A 63-yr-old married, Caucasian male, started showing clinical signs of intoxication when he was not consuming alcohol. Patient presented to the clinic for management of Major Depressive Disorder. During evaluation patient was noted to be intoxicated and alcohol dependence was suspected. Per obtained history, patient admitted to having quit stopping to drinking three years ago following a blackout after one glass of wine. Before this, he could consume a bottle of wine without getting intoxicated. A few months prior to this event, he returned from a Caribbean vacation with Giardiasis and was treated with a prolonged course of antibiotics. Collateral from wife, reported that patient showed clinical signs of intoxication: agitation, alteration in mentation, ataxia, slurring of speech, and even the smell of alcohol on his breath. Patient keeps on denying alcohol ingestion but as he has history of alcohol use disorder, family became skeptic and it started effecting his relationship with his family especially wife. With support from family and friends, patient put a tracker on his phone, bars in his town were asked not to serve him, and his car keys were taken away. Both his wife (a physician) and daughter (who was often at home with the patient) reported that he wasn't drinking.

**Results:** After extensive observation and work-up, it was noted that he showed clinical signs of intoxication 24-48 hours after ingestion of simple carbohydrates (sugars) or within a few hours of severe physical or emotional stress. An attempt to induce alcohol production utilizing a glucose challenge and serial BAC (Blood Alcohol Concentration) resulted in no levels over 3 hours. The diagnosis of intoxication was finally verified during a period of 12 hours continuous supervision and measurement by a DOT-approved Breathalyzer documenting a BAC of 0.24. Patient was put on Nystatin oral suspension QID, daily multivitamin/mineral supplements and a low carbohydrate (<5 gm added sugar per serving) diet. The frequency of positive BAC > 0.06 has decreased from 5 times/week to once/month.

**Conclusions:** Auto-brewery syndrome is a rare condition and clinical consideration should be undertaken with substantial caution, especially in patients with alcohol use disorder, given lack of validated mechanism linking endogenous alcohol production to blood alcohol level. Though treatment algorithm is not validated, judicious use of antibiotic, diet modification (carbohydrate control), anti-fungal therapy and vitamin/mineral supplements have been reported in literature.

**Summary:** Auto-Brewery syndrome is a rare disorder, which shows evidence of alcohol intoxication without ingesting alcohol, due to ethanol formation in intestine through fermentation of consumed carbohydrates by yeast or bacteria.

Though treatment algorithm is not validated, judicious use of antibiotic, diet modification, anti-fungal therapy and vitamin/mineral supplements have been reported in literature.

**Funding Sources:** None

## Poster 13: Buprenorphine a Safer Alternative in Elderly Population with Opioid Use Disorder and Chronic Pain.

**Roopa Sethi, MD**, *University of Kansas Medical Center*; **Dheepthi Arakonam Ravishankar, MBBS**, *University of Kansas Medical Center*

**Background:** Substance use disorder is increasingly becoming a problem among elderly population in the United States. The number of Americans aged 50+ years with a substance use disorder is projected to double from 2.8 million in 2002-2006 to 5.7 million in 2020. People aged 60 years and over in the world has been more 700 million. This accounts for more than 10% of the population. Opioid Use Disorder (OUD) in elderly is a major concern and it is an important challenge to Western societies due to rising numbers, higher incidence of pain problems in this population and their increased susceptibility to adverse effects to medication. Looking at the factors that are liable to influence opioid action in the elderly population we find there is a major challenge awaited for the physician prescribing opioids in the elderly and their high risk of medication-associated complication. Aging has a great impact on pharmacokinetics of opioids and organ function example liver for metabolism and kidney for excretion. Careful titration policy, regular follow up and review is essential in the elderly and dosing intervals may be lengthened subsequently to prevent the misuse.

**Methods:** Thorough literature search with keywords, "buprenorphine," "Opioid use disorder" "elderly" "pain" "older adults" and "Medication Assisted Treatment (MAT)" was done. PubMed, CINAHL, google scholar, medline databases were searched upto May 2019 to identify relevant literature limited to English language. Studies were excluded if they included non-human subjects.

**Results:** Chronic pain treatment in the elderly population include pharmacological treatment with nonopioid, opioid as well as adjuvant medications. Chronic pain in the elderly poses a significant problem due to the age-related metabolic, cognitive and pharmacokinetic changes associated with advanced age make pain control in the elderly a challenge. If a physician suspects opioid use disorder (OUD) in the pain population, it complicates the clinical picture. Out of the drugs used for medication assisted treatment, buprenorphine may be a preferred drug due to various reasons. Its long-acting analgesic property and relative safety mode of administration makes it the best option for the treatment of OUD and pain in the elderly. Buprenorphine acts centrally as a partial mu agonist and a kappa and delta opioid receptor antagonist. Buprenorphine has very high affinity for receptor, long duration of action and slow dissociation rate. Buprenorphine can be used in elderly patients with renal impairment and chronic renal insufficiency, and in hemodialysis patients in whom the pharmacokinetics of the drug is not altered. Buprenorphine pharmacokinetics is unchanged in mild to moderate hepatic impairment. The likelihood of respiratory depression with buprenorphine is less (unlike morphine and fentanyl which causes severe respiratory depression and apnea in high doses). Nausea, vomiting and constipation can occur with buprenorphine but these side effects occur significantly less. Literature search reveals that chronic exposure to buprenorphine has shown no undesirable effects on corticosteroid sensitive immune parameters. Buprenorphine, unlike morphine, was not associated with immunosuppression and did not activate the hypothalamic-pituitary axis, which could be attributed to

its partial agonist effects. Elderly patients need special consideration with several factors like drug delivery and interactions, and treatment compliance. The low incidence of adverse events associated with buprenorphine and low susceptibility to toxicity and opioid abuse makes it the preferred drug for use in the elderly who have decreased tolerance to adverse effects. The use of buprenorphine in the elderly with other drugs such as statins, beta blockers etc. requires further research as buprenorphine is known to inhibit the cytochrome P 450 system. Buprenorphine should be used with caution in elderly when it is being used with drugs like benzodiazepines because of synergistic effect on the Central nervous system causing sedation and respiratory depression. To illustrate this, patient with cancer pain, opioid use disorder or history of drug abuse, buprenorphine would be a reasonable choice in combination with naloxone.

**Conclusions:** The safety and effectiveness of buprenorphine makes it the best choice for older individuals who have a higher predisposition for the development of renal insufficiency or hepatic impairment. Its low potential for drug to drug interaction and the beneficial effects on the immune system makes it the ideal choice for opioid use in the elderly. It must be remembered, however, that buprenorphine can cause sedation when used with other central nervous system depressants and the elderly should be monitored carefully for it. More outcome studies are needed on the effectiveness of buprenorphine for opioid use disorder and control of chronic pain in the elderly.

**Summary:** Opioid use disorder in the elderly is increasing. Recognition of OUD in elderly by physicians is a challenge. In elderly who got dependent on opioids while being treated for pain, buprenorphine might be a safer alternative as compared to other drugs. Knowing the safety profile and effectiveness of this medication would help physicians treat the patient appropriately without hesitation.

**Funding Sources:** None



## Poster 14: Buprenorphine Self-Regulation for Infrequent Cravings in Patients with Opioid Use Disorder without Regular Maintenance Therapy

**Robert Rymowicz, DO**, Rutgers New Jersey Medical School; **Erin Zerbo, MD**, Rutgers New Jersey Medical School; **Mia Kunitomo, BS**, Rutgers New Jersey Medical School; **Pallavi Joshi, DO, MA**, Northwell Health-Staten Island University Hospital; **Elizabeth Fam, BA**, Rutgers-NJMS

**Background:** Buprenorphine is a partial agonist of the  $\mu$ -opioid receptor and a Schedule III controlled substance available for the treatment of opioid use disorder as an oral liquid, tablet, sublingual film, depot injection, and implant. In the United States, immediate-acting formulations are more commonly available as a combination medication including naloxone. Buprenorphine products are approved for detoxification and for maintenance treatment of a potentially indefinite duration, with regularly scheduled dosing. Buprenorphine products are not prescribed for use on an as needed basis, but in practice are frequently administered this way. A growing body of evidence supports emergency department initiated buprenorphine/naloxone, with many patients failing to present for follow-up. The diversion of buprenorphine is well studied, and is often available through the same channels as illicit opioids. Less is known about the pro re nata self-administration of buprenorphine by patients with opioid use disorders in remission without maintenance therapy, but patient reports suggest that the practice is not uncommon.

**Methods:** A review of available literature was conducted using PubMed to determine if previous scholarly work had been attempted on the subject of buprenorphine administered as needed in the context of opioid use disorder in remission without regular maintenance therapy. In light of the small number of results and various possible terms to describe what in DSM-5 is referred to as opioid use disorder, it was not necessary to limit the scope of the search with exclusionary criteria. Methadone was later included in an attempt to yield additional information, with the hope that findings relevant to it might be generalized to buprenorphine.

**Results:** No results were found discussing the as needed administration of buprenorphine or methadone to patients with opioid use disorders in remission without regular maintenance therapy.

**Conclusions:** In the clinical experience of the author, patients have occasionally reported using small doses of buprenorphine products on an irregular basis, as needed, to self-medicate in response to the psychological distress of cravings, and to avoid potential relapse on illicit opioids. While buprenorphine use under such circumstances may well meet diagnostic criteria for opioid use disorder, it nonetheless represents a successful harm-reduction strategy, and may in fact predispose a patient to fewer adverse effects than maintenance therapy – a critical consideration for geriatric and medically complicated populations.

**Summary:** Further studies are needed to determine whether such a strategy should be discouraged, condoned, or encouraged. Patients who feel that they do not require frequent dosing should not be forced to choose between over-medication and side-effects through maintenance therapy, or risk of relapse through detoxification and abstinence.

**Funding Sources:** None

## Poster 16: Characteristics of Opioid Overdose Survivors Admitted to Hospital Emergency Departments

**Nina Cooperman, PsyD**, *Rutgers Robert Wood Johnson Medical School*; **Anna Kline, PhD**, *Rutgers Robert Wood Johnson Medical School*; **Jill Williams, MD**, *Rutgers Robert Wood Johnson Medical School*; **Trish Dooley-Budsock, MA**, *Rutgers Robert Wood Johnson Medical School*

**Background:** There is an opioid overdose epidemic in the United States, and effective interventions that link people with an opioid use disorder (OUD) and who have overdosed to medication-assisted treatment (MAT) are needed. Hospital emergency departments (EDs) provide an opportunity to link people who have overdosed to MAT (i.e., methadone, buprenorphine, or naltrexone); interventions are being implemented across the country to help link people with an OUD to MAT. Understanding the characteristics of individuals currently being admitted to EDs for opioid overdoses and their motivation for treatment and knowledge about MAT could help inform treatment linkage efforts.

**Methods:** To inform a larger study of ED-based interventions for MAT treatment linkage among individuals admitted to hospital EDs for an opioid overdose, we conducted a pilot survey study in two urban hospitals in New Jersey. People admitted to the EDs for an opioid overdose were recruited and interviewed (N=52) during their ED admission.

**Results:** Participants were mostly male (83%) and Black (58%) or Hispanic (27%), with a mean age of 45 ( $\pm 11$ ). A high percentage of participants had a history of depression (56%), anxiety (50%), bipolar disorder (38%), and posttraumatic stress disorder (28%). Most had experienced at least one previous overdose (69%), with 21% experiencing 10 or more. Although most participants heard about methadone (82%), buprenorphine (82%), or naltrexone (50%), a minority had ever participated in these treatments (25%, 16%, and 8%, respectively). However, 88% reported high motivation to stop using drugs, and 70% reported willingness to enter treatment for substance use as soon as possible.

**Conclusions:** ED-based interventions that link individuals who have had an opioid overdose to treatment and also consider mental health and MAT knowledge are needed.

**Summary:** Most participants had experienced multiple overdoses and were highly motivated for treatment. However, a minority had ever received MAT, and many still had gaps in knowledge about MAT. Further, the majority of participants reported a history of psychiatric disorders. ED-based interventions link individuals who have had an opioid overdose to treatment and also consider mental health and MAT knowledge are needed.

**Funding Sources:** This work has been supported by the Laura and John Arnold Foundation

## Poster 17: Chronic Pain Patients have Greater Rates of Substance Use, Family Substance Use History, and History of Childhood Sexual Abuse when Compared to Psychiatric Controls: A Case-Control Analysis.

**Xavier Jimenez, MD, Cleveland Clinic; Molly Do, MD, Cleveland Clinic; Olivia Hogue, PhD, Cleveland Clinic**

**Background:** Chronic pain is known to be associated with numerous comorbidities including psychiatric disease and addiction; this has been demonstrated repeatedly when compared to healthy control populations. However, less is known about these comorbidities in the chronic pain population when compared to a psychiatric control group. Furthermore, specific clinical and developmental features such as substance use, family substance use history, and childhood trauma histories have been observed in high rates in chronic pain patients, though not rigorously compared with psychiatric comparators. Therefore, the goal of this study is to determine whether chronic pain patients differ from psychiatric controls with regards to substance use, family substance use, family psychiatric history, and/or childhood trauma. We hypothesized greater rates specifically of family substance use history and childhood trauma histories amongst chronic pain patients when compared to psychiatric controls.

**Methods:** Retrospective analysis of demographic, clinical, and historical features in both chronic pain patients and psychiatric (non-pain) patients was conducted. Both groups were selected from ambulatory clinics from the same time period. Variables of interest included age, sex, employment status, marital status, and past psychiatric, family psychiatric, substance use, family substance use, and trauma histories. Simple logistic regression models were used to determine whether groups differed on variables of interest, controlling for sex or age as necessary.

**Results:** The sample included 107 chronic pain patients and 130 psychiatry controls. The most common pain complaint amongst chronic pain patients was diffuse body pain (62.6%). When controlling for sex and age, patients with chronic pain had more than twice the odds of a history of substance use ( $p = .003$ ). Patients with chronic pain had twice the odds of a family history of substance abuse ( $p = .01$ ). When controlling for sex, patients with chronic pain had twice the odds of a history of childhood sexual abuse ( $p = .031$ ). There were no other statistically-significant differences between groups.

**Conclusions:** This analysis confirms anecdotal suspicions of greater rates of substance use, family substance use history, and childhood trauma history (specifically sexual abuse) amongst chronic pain patients when compared to psychiatric controls. Mechanistic possibilities are explored, and implications for treatment are discussed.

**Funding Sources:** None

## Poster 18: Comparing Outcomes of Neonates Born to Mothers with Opioid Use Disorder

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**Background:** To minimize negative consequences of opioid use disorder in pregnancy, medication assisted therapy (MAT) with methadone and buprenorphine has been widely used, but few studies compare their effects on neonates. This study compares how in utero exposure to methadone, buprenorphine, or no MAT affects neonatal length of hospitalization and pharmacotherapy requirements to treat neonatal abstinence syndrome (NAS).

**Methods:** This is a retrospective study of 154 mother-neonate dyads admitted to a community-based hospital network over a 24-month period (2016 to 2018). Subjects were identified by electronic medical record query for opioid-positive maternal or neonatal urine drug screens, opioid-positive neonatal cord blood, maternal MAT enrollment, or NAS diagnosis. Mothers without opioid use disorder were excluded. Data were collected on maternal MAT program enrollment (if any), neonatal hospitalization length, NAS treatment type and length, and potential correlates. Correlates included demographics; maternal use of tobacco, illicit drugs, or SSRI; gestational age; neonatal biometrics; and others. Statistical comparisons were performed via Fisher exact, Chi-square, and Kruskal-Wallis tests as appropriate.

**Results:** Forty-two neonates were born to mothers not treated with MAT antepartum (no MAT group), 46 to mothers treated with methadone (methadone group), and 66 to mothers treated with buprenorphine (buprenorphine group). Neonates requiring opioid to treat NAS were 86%, 70%, and 48% in no MAT, methadone, and buprenorphine groups, respectively ( $p=0.00011$ ). Median (and interquartile range, IQR) lengths of neonatal hospitalization were 18 (IQR 19), 25 (IQR 22), and 14 (IQR 18) days for no MAT, methadone, and buprenorphine groups, respectively ( $p=0.0020$ ). Median lengths of opioid treatment for NAS were 15 (IQR 17), 13 (IQR 23), and 0 (IQR 13) days in no MAT, methadone, and buprenorphine groups ( $p=0.00071$ ).

**Conclusions:** Managing opioid use disorder in pregnancy with buprenorphine yields shorter neonatal hospitalizations and NAS pharmacotherapy duration compared to methadone or no MAT. Further research is needed to determine which maternal treatment minimizes neonatal effects.

**Summary:** Opioid use disorder is becoming increasingly common in pregnancy. Its negative effects can be ameliorated by treating affected mothers with MAT during pregnancy. This study of 154 mother-neonate dyads compared three groups: (1) neonates born to mothers without MAT treatment, (2) neonates born to mothers treated with methadone MAT, and (3) neonates born to mothers treated with buprenorphine MAT. Of the three groups, neonates born to mothers treated with buprenorphine MAT had the shortest hospitalizations and the lowest opioid requirements for NAS treatment.

**Funding Sources:** Family and Social Services Administration of Indiana, NAS Grant

## Poster 20: Current Practice in Withdrawal Management: Opportunities to Improve Treatment of Opioid Use Disorder

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**Background:** Medications for the treatment of opioid use disorder (OUD; extended-release injectable naltrexone [XR-NTX], buprenorphine, and methadone) are effective yet underutilized. A 7-10 day opioid-free period is recommended prior to initiating XR-NTX. While safe and effective withdrawal management (detoxification) protocols have emerged from recent research, there remains a lack of standardized protocols to guide clinicians. This study examined current practices in withdrawal management and XR-NTX induction and the perceived barriers to XR-NTX for the treatment of OUD across practice settings.

**Methods:** A mixed-methods study using both quantitative and qualitative data was conducted. Health care providers (HCPs) who treated >5 people with OUD/month and intended to prescribe a medication for OUD in the next 6 months completed a cross-sectional quantitative online survey. A subset of these participated in in-depth qualitative telephone interviews. HCPs were stratified by their primary practice setting as "outpatient" (clinics or office-based sites) or "inpatient" (residential facilities or hospitals). Survey responses were summarized for all HCPs and stratified by primary practice setting and prescribing history (prescribers vs. non-prescribers of antagonist therapy in the past 12 months).

**Results:** The study sample included 148 HCPs (outpatient HCPs n=99 and inpatient HCPs n=49) who completed the online survey; 35 of whom participated in in-depth interviews. The HCPs were primarily male (74%), White (72%), and physicians (82%). The majority (78%) were primary care providers (PCPs), and only around one-fourth of HCPs were addiction specialists. Most HCPs had performed withdrawal management in patients with OUD in the previous 12 months. Tapering doses of buprenorphine was the most commonly used method (outpatient HCPs 69% and inpatient HCPs 57%). More inpatient HCPs (44%) than outpatient HCPs (34%) used an induction regimen (including withdrawal management) for <7 days. Nearly 69% of HCPs offered XR-NTX following withdrawal management; however, only 16% successfully initiated >50% of their patients onto XR-NTX (inpatient HCPs 21% and outpatient HCPs 13%). Only 44% of inpatient and 38% of outpatient HCPs had received training in XR-NTX induction procedures. In both practice settings, more antagonist prescribers than non-prescribers reported having adequate access to continuing medical education opportunities in addiction (inpatient 83% vs. 60%, and outpatient 86% vs. 69%). More antagonist prescribers than non-prescribers also reported the availability of sufficient support staff to treat patients with OUD (inpatient 72% vs. 45%, and outpatient 77% vs. 62%). Regarding perceived barriers to initiating treatment with XR-NTX, more inpatient HCPs reported knowledge gaps about effective withdrawal management as a barrier compared to outpatient HCPs (71% vs. 56%). In both settings most HCPs (>75% for each item) identified patients' fear of withdrawal, HCPs' concern about patient relapse, lack of insurance coverage for withdrawal management,

reimbursement for support services, linkages between detoxification and outpatient programs, and availability of detoxification facilities as barriers to prescribing XR-NTX.

**Conclusions:** Given the growing opioid epidemic in the United States, it is important to understand barriers to the utilization of medications from the perspective of HCPs. Among the HCPs surveyed the success rate of inducing patients with OUD onto XR-NTX following withdrawal management was low. Training opportunities related to withdrawal management and induction onto XR-NTX may enhance success with XR-NTX initiation. Policies focusing on expanded insurance coverage for management of OUD including reimbursement for withdrawal management and infrastructure support linking detoxification centers with outpatient programs are warranted. Limitations include a small sample of HCPs who were mainly PCPs, therefore the results may not be generalizable to other provider specialties.

**Summary:** Medications for the treatment of OUD (XR-NTX, buprenorphine, and methadone) are effective yet underutilized. A mixed-methods study using both quantitative and qualitative data was conducted. Health care providers who treated >5 people with OUD/month and intended to prescribe a medication for OUD in the next 6 months were included in the study. Among the HCPs surveyed, the success rate of inducing patients with OUD onto XR-NTX following withdrawal management was low. Training opportunities related to withdrawal management and induction onto XR-NTX may enhance success with XR-NTX initiation. Policies focusing on expanded insurance coverage for management of OUD including reimbursement for withdrawal management and infrastructure support linking detoxification centers with outpatient programs are warranted.

**Funding Sources:** Center of Excellence in Substance Addiction Treatment and Education (CESATE) at VA Puget Sound Health Care System.

## Poster 22: Does Pre-existing Alcohol Dependence increase the risk of developing Post-Traumatic Stress Disorder? Results from a longitudinal nationally-representative sample.

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**Background:** There is inconsistent evidence in the literature on Alcohol Use Disorder (AUD) being a risk factor for Post-Traumatic Stress Disorder (PTSD). This study aims to evaluate the potential risk AUD poses on PTSD development.

**Methods:** Longitudinal data was obtained from 30,180 individuals (16,882 females) with and without AUD from National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) waves I and II. Using propensity score methods, we matched individuals with AUD (alcohol abuse and/or dependence using DSM-IV criteria) to those without AUD, at baseline, on demographics, familial and clinical factors to estimate the risk of development of PTSD after trauma exposure, then tested if alcohol dependence or alcohol abuse separately, as a secondary analysis, increases the risk of PTSD development. Data were adjusted for complex survey methods. We also explored the effect of AUD on exposure to various types of traumas.

**Results:** Individuals with AUD had an increased risk of being exposed to all types of trauma between wave I and II (60.6% vs. 48.3% of controls). Among individuals who were exposed to trauma between the two waves (N=14,107), AUD had no effect on subsequent PTSD development (OR: 1.00; 95%CI: 0.72-1.39; p=0.99) after matching and controlling for covariates, but those with alcohol dependence alone did (OR:1.76; 95%CI: 1.05-2.95; p=0.03).

**Conclusions:** The results support that AUD increases the risk of being exposed to trauma and that alcohol dependence increases the risk of PTSD development. These findings suggest that prevention methods from PTSD after trauma exposure for individuals with alcohol dependence are needed.

**Summary:** The literature does not consistently support Alcohol Use Disorder (AUD) as a risk factor for the subsequent development of Post-Traumatic Stress Disorder (PTSD). This study re-examined that relationship. Longitudinal data were obtained from 30,180 individuals (16,882 females) with and without AUD from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) waves I and II. Individuals with AUD were matched by covariates to those without AUD to estimate the risk of trauma exposure and development of PTSD after trauma exposure. Through secondary analysis, those with alcohol dependence and abuse were compared against each other as to whether they increased the risk for PTSD development. Among individuals who were exposed to trauma between the two waves (N=14,107), AUD had no effect on subsequent PTSD development (OR: 1.00; 95%CI: 0.72-1.39; p=0.99) after matching and controlling for covariates, but those with alcohol dependence alone had an increased risk of developing PTSD after trauma exposure (OR:1.76; 95%CI: 1.05-2.95;



$p=0.03$ ). These results add support to the presence of AUD and alcohol dependence as predisposing risk factors for trauma exposure and development of PTSD respectively, and suggest the need for appropriate screening and psychoeducation in this group of patients.

**Funding Sources:** None

## Poster 24: Efficacy and Safety of Varenicline for Smoking Cessation in Schizophrenia: A Meta-Analysis.

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**Background:** Smoking represents a major public health problem among patients with schizophrenia. To this end, some studies have investigated the efficacy of varenicline for facilitating smoking cessation in schizophrenia patients. The present analysis seeks to synthesize the results of these studies as well as document the reported side effects of using this medication.

**Methods:** An electronic search was performed using five major databases: PubMed, Scopus, EMBASE, Web of Science, and Cochrane Library. Included in the current analysis were randomized clinical trials (RCTs) that have investigated the effect of varenicline in promoting smoking cessation in patients with schizophrenia. Risk of bias among included RCTs was assessed using the Cochrane Collaboration's quality assessment tool.

**Results:** Among the 828 screened articles, only four RCTs, which involved 239 participants, were eligible for meta-analysis. In patients with schizophrenia, varenicline treatment when compared to placebo significantly reduced the number of cigarettes consumed per day [SMD (95% CI) = 0.89(0.57–1.22)] and expired carbon monoxide levels [SMD (95% CI) = 0.50 (0.06–0.94)] respectively.

**Conclusions:** Despite a limited number of studies included in the meta-analysis, our results suggest that varenicline is an effective and safe drug to assist smoking cessation in patients with schizophrenia. Future large-scale well-designed RCTs are required to validate these findings.

**Summary:** The current meta-analysis demonstrates therapeutic efficacy of varenicline in smoking cessation in clinically stable schizophrenic patients. However, the conclusion is subjected to certain limitations. Because of pre-established inclusion criteria and relatively a few clinical studies performed on this topic, we analyzed only a small number of studies. The larger controlled trials on this topic are needed to draw a firm and evidence-based conclusion. Future clinical studies should consider assessing the impact of the duration of varenicline treatment, its role in relapse prevention over extended periods of time, dose-dependent responses for smoking cessation, and consider smoking reduction in addition to smoking cessation.

Some unique aspects of current metanalysis:

A) The novelty of the current study is evidenced by results, which were drawn after modifying and refining our analytic methodology.

B) We expanded parameters of literature search, added recently published studies especially after 2015 (Last known metanalysis on this topic was conducted in 2015 by Kishi et al.,).

C) Our study has some strengths such as refining our inclusion criteria to target only studies that elucidated the efficacy and safety of varenicline for smoking cessation in schizophrenic patients. (

Previously published metanalysis inappropriately included two trials which were not smoking cessation trials- Kishi et al.,).

D) We assessed the quality of evidence by using the Cochrane tool, which is the universally accepted and recommended methodology for analysis of randomized trials.

E) The results of our study show that varenicline is an effective and safe drug to use for smoking cessation in patients with schizophrenia.

Reference: Kishi T, Iwata N. Varenicline for smoking cessation in people with schizophrenia: systematic review and meta-analysis. *Eur Arch Psychiatry Clin Neurosci.* (2015) 265:259–68. doi: 10.1007/s00406-014-0551-3

**Funding Sources:** None

## Poster 25: Embracing Complexity: An Example of Shared Care in Addictions Psychiatry

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**Background:** Substance use disorders and mental illnesses are often comorbid, with varying levels of psychiatric and addictions complexity. As Rapid Access Addictions Medicine (RAAM) clinics have evolved to provide urgent care to individuals struggling with opioid and other substance use disorders, treatment of co-occurring mental illnesses has also become important. Access to psychiatry varies greatly across Ontario, Canada, and these complex clients are identified by SAMHSA as needing, “intensive, comprehensive, and integrated services for both their substance use and mental disorders” (<https://www.ncbi.nlm.nih.gov/books/NBK64184/>).

**Methods:** This is a descriptive study of an evolving relationship between addictions psychiatry and a multidisciplinary team in a region with limited access to psychiatric services.

**Results:** The Brantford RAAM Clinic is a multidisciplinary team which opened in the fall of 2018 to provide addictions treatment services to the city of Brantford and surrounding area. The RAAM initially requested psychiatric consultations using a telepsychiatry model, to meet the needs of complex clients with psychiatric and substance use comorbidities. To meet these needs, care has grown beyond psychiatric consultations to include case conferences, educational rounds and the integration of the consultant into the team, such as through the use of shared EMR. This evolving model has been acceptable to the team and allowed capacity building as the RAAM grows.

**Conclusions:** Consultations alone were not sufficient to serve the needs of a RAAM with significant psychiatric comorbidity. Integrated telepsychiatry care has provided a way of increasing psychiatric services for this clinic.

**Summary:** Clients with both significant mental health concerns and significant substance use disorders require intensive services. This is challenging in under-resourced areas. Our experience shows that addictions telepsychiatry can address these needs, but consultations alone were insufficient, and a greater integration of the consultant was beneficial.

**Funding Sources:** None

## Poster 26: Examining the Worldwide Use of Kratom (*Mitragyna speciosa*) in the Adolescent Population: A Literature Review

**Ashvin Sood, MD, NYU Langone; Olufisayo Omotunde, MD, NYU Langone; Asha Martin, MD, NYU Langone; Jose Vito, MD, NYU**

**Background:** Kratom, also known as *Mitragyna speciosa*, has become an increasingly abused psychoactive substance worldwide due to its opiate and stimulant properties. Historically, Kratom was used by farmers to combat fatigue after work. Over the past several decades, the availability of Kratom has increased, with users having the ability to purchase Kratom online. Additionally, the cost of Kratom compared to other opiate agents is relatively low. The aforementioned factors paired with lack of regulation has led to abuse of Kratom in adult populations. However, demographic data regarding Kratom use among adolescent populations remains unclear. The purpose of this literature review is to closely examine epidemiology pertaining to Kratom use in adolescent populations around the world.

**Methods:** The authors conducted a systematic review of published literature dating from December 2007 to May 2019 via five online databases (PUB-MED, PsycINFO, Web of Science, EMBASE, and MEDLINE.) Key words employed during search inquiries included Kratom, *Mitragyna speciosa*, Mitragynine, and Adolescent.

**Results:** Initially, 2741 articles were gathered. We then excluded case reports, case series, review of literatures, repeated articles, and literature that did not include a child and adolescent population. There was a total of 9 articles that met criteria. These studies assessed trends in Kratom use in the adolescent population, specifically those in Thailand, Italy, and the United States.

**Conclusions:** Studies indicate that Kratom use has grown steadily over the past 2 decades and is more common in the male population, adolescent age range, and those who use multiple substances. Furthermore, studies note an increase in pediatric hospitalizations due to Kratom exposure. However, literature is significantly limited and more epidemiological studies are needed to further characterize Kratom use in the child and adolescent population.

**Summary:** In summary, Kratom use among adolescent populations has increased in the United States and Thailand. This research also allows clinicians to have insight into demographic data regarding adolescent populations who may be at an increased risk of using Kratom. The implications of these findings demonstrates the need to assess for Kratom use in young adult populations.

**Funding Sources:** None

## Poster 27: Extrapolating Long Term Success in MAT

**Matt Wachsmann, MD, PhD, *Serenity Health***

**Background:** Medication Assisted Treatment (MAT) has proven efficacy but is limited by low participation. This is due both to the overwhelming majority of opiate addicts not seeking treatment and to high attrition among those in MAT. Those leaving treatment are generally neither included in analysis nor studies. We used curve analysis, modeling, and analysis of clinical data to demonstrate that most current opiate addicts improve over time and are likely to survive their addiction. Furthermore, we compared groups receiving methadone and those receiving buprenorphine/naloxone (BuN).

**Methods:** Chart data from the first one hundred patients each at two methadone treatment facilities and one outpatient BuN center were analyzed retrospectively. We examined the attrition curves of those receiving methadone and BuN with standard parametric and non-linear regression curve fitting. The characteristics of those returning to treatment were also examined. Furthermore we bootstrapped this information into computer simulations.

**Results:** The 100 patient cohorts were followed for over 6 years at the two methadone centers and for over 3 years in the BuN cohort. Attrition rates were higher with BuN than methadone with 30% of the BuN versus 12% in methadone cohorts leaving after one day, and with similar 10% retention rates at the end of 3 years with BuN treatment compared to an over 6 year observation period with methadone treatment. All attrition curves are best fit by a weibul distribution—logarithmic exponential decline with a declining exponent ( $r^2 > 0.9$  for all groups). The characteristic triphasic curves had a rapid initial decline, a long plateau, and a second late decline was seen in all cohorts but was foreshortened in the BuN group. Each cohort had similar rates of patients returning to therapy. Those returning had similar increased success in terms of longer retention and fewer positive urine screens. For the methadone groups, initial duration in therapy was 11.5 months increasing to 19 months on returning to treatment. Urine toxicology screens were positive for opiates in 41% of samples initially at the methadone centers and decreased in those returning to treatment down to 26%.

**Conclusions:** The similarities between MAT with BuN and methadone outweigh any differences. The best fit to the attrition curve data from each group was to a weibul distribution. In both therapies, the majority of patients in therapy leave and significant numbers of these return. In each group, those who return demonstrated improvement in terms of retention in therapy and urine screens. Attrition was higher in BuN compared to methadone. But with each cycle of leaving and returning being associated with improvement, the accelerated attrition may also hasten attrition from addiction. Indeed, this may be what the terminal phase of the attrition curve represents.

**Summary:** Observations from patients in methadone and BuN treatment programs were retrospectively studied by chart review. Curve analysis implies decreasing failure over time. Data on those returning to therapy supports this. Those in BuN treatment fail faster than those in methadone treatment. While this lowers the numbers in treatment it also likely paradoxically increases therapeutic progress.

**Funding Sources:** None

## Poster 28: The Pharmacology of Psychology. Adapting "Readiness to Change" to Compartmental Analysis.

**Matt Wachsmann, MD, PhD, *Serenity Health***

**Background:** Despite Medication Assisted Treatment being found to be effective at stopping the opiate epidemic, it has not been well utilized. The overwhelming majority of patients with addiction, do not go in a single straight pathway through the states of change. Rather, they go in and out of therapy multiple times. This is considered treatment failure and those falling out of therapy are ignored and often have increased barriers for returning.

**Methods:** Utilizing Prochaska's Readiness to Change Model and also compartmental mathematical models a mathematical model for addiction was built. The effect of changing each of the parameters is presented along with actual clinical data from methadone and suboxone centers. Specifically, data from the first one hundred patients at two methadone treatment facilities and one outpatient suboxone center were analyzed using a variety of measures. We examined the attrition rates at each using both standard parametric statistical analysis and non-linear regression curve fitting. We also looked at the outcomes of those returning to treatment.

**Results:** The attrition rates were quite similar to those reported in the literature with about 10% of those in methadone treatment and 30% of those in suboxone treatment leaving immediately and the rates of attrition in all centers declining over time. Furthermore we found that those returning to therapy had improved outcome in terms of longer retention in treatment and less substance abuse as shown by urine toxicology screens.

**Conclusions:** This has two critical implications that are not currently appreciated: treatment failure and leaving treatment and returning improves outcome measures and is part of the recovery process.

**Summary:** Using standard compartmental pharmacologic modeling, we built a mathematical model for Prochaska's States of Change. Negative outcomes rates and patient groups falling out of treatment were not included in Prochaska's original conception although these are the most clinically relevant. Specifically, mortality, the cohort of patients who have left treatment and the rates of patients having negative outcomes are most relevant to solving the opiate epidemic. Having a mathematical framework allows planning for optimal policies. It highlights what data is most relevant to obtain and also allows optimization of treatment even with sparse or missing data.

**Funding Sources:** Serenity Health LLC

## Poster 29: Flick It, I Quit!

**Quincy Zhong, MD**, *University of Virginia in Charlottesville*; **Robert Klesges, PhD**, *University of Virginia*; **Nassima Ait-Daoud Tiouririne, MD**, *University of Virginia*; **Pooja Amin, MD**, *University of Virginia*

**Background:** Smoking cessation is a dynamic process that often involves a sequence of unsuccessful attempts to quit before long-term abstinence is achieved. A significant number of smokers express a desire to quit at various times in their smoking history, and only about one-third of them actually attempt to quit each year and few are successful. We know very little about what factors contribute to making a quit attempt, but previous studies have indicated that motivation to stop, previous attempts to stop, concerns about the harmful effects of smoking, and lower enjoyment of smoking were all predictive of quit attempts. This pilot study aims to capture the number of unplanned quit attempts amongst adult cigarette smokers over the past one year and to assess if these individuals sought help to quit as well as the options used to assist in quitting. The information provided will allow us to tailor interventions that meet patients' needs at the time they express a desire to stop smoking and increase their chances for success.

**Methods:** This study recruited cigarette smoking participants who completed a brief online Qualtrics survey by answering questions related to unplanned quit attempts in the past one year. The questions assessed for number of unplanned quit attempts, motivating factors for the attempts, methods used to assist in the attempts, outcome of the attempts, and resources that participants found helpful during the attempts. We conducted a descriptive analysis of the data collected.

**Results:** 402 participants completed the online survey with almost 42% reporting at least one unplanned quit attempt. The number of all quit attempts ranged from 1 to 50 times over a one year period, with a mean of 2.72 attempts and mode of 2 attempts. The number of unplanned quit attempts ranged from 1 to 44 times, with a mean of 1.3 and a mode of 1 attempt. The most common reason for the unplanned quit attempts was "future health concerns," followed by "doctor's advice to quit" and "can't afford cigarettes." The most common tactic used for unplanned quit attempts was "nicotine therapy." The most common method that participants felt would help them quit was "free nicotine replacement therapy."

**Conclusions:** A significant number of smokers report unplanned quit attempts, with health concerns and doctor advice being the top reasons for these attempts. These results highlight the importance of providers' continual involvement in educating and counseling patients on the adverse health effects of cigarette smoking, even when patients have no intention to quit at the time.

**Summary:** Patients could benefit from referral to a smoking quitline (1-800-QUIT-NOW), which can provide a variety of services including information on medications, free or discounted medications, self-help materials, and referrals to other resources for when the patient feels ready to quit. Another alternative could be a preemptive prescription for nicotine replacement therapy or a smoking cessation medication so patients have it available on the day they decide to quit.



**Funding Sources:** The University of Virginia Strategic Investment Fund supported the advertisements for this study.

## Poster 30: Health Policy of Marijuana

**Thersilla Oberbarnscheidt, MD, *University of Pittsburgh*; Norman Miller, MD, *Univeristy of Georgia***

**Background:** The current trend of legalization of marijuana for recreational or "medical" use is affecting physicians from all disciplines and leads at times to confusion and frustration how to handle the patient's use and understand the current legal aspect of it. Where are we at with the current marijuana laws? What is the positions of the public and major health organizations? What should physicians do for the future trend? Is the legalization beneficial or harmful for the public? This presentation will address these questions.

**Methods:** Systematic review of literature sources: PubMed, Ovid, Web

**Results:** Marijuana is a drug with over 400 chemically active ingredients that are not completely understood and identified. It has a long list of toxic effects ranging from COPD, cancer, Psychiatric conditions depression, anxiety, ADHD to problems with cognition. Yet it is advertised to cure devastating diseases: AIDS, ALS, Huntingtons, Dementias. The public is pushing towards the legalization of marijuana in many states and subjective reports are claiming marijuana to be beneficial while actual controlled research studies have shown controversial data regarding marijuana's clinical efficacy. Major health organizations are warning about the medicinal use of marijuana but economic interests, revenue and tax money as well as users are claiming the continuation of legalization.

**Conclusions:** 1. Commercialism, professionalism, corporations and marijuana industry will likely take over if legalization of marijuana ultimately occurs, and be more safe and healthy than the current local medical marijuana growth and distribution. In a world where widespread use of marijuana is a fact and legalization is a growing trend, large business organizations may have an important and positive role to play. 2. Currently, smoked marijuana has no proven benefit for medical purposes and is not part of main stream medical care, though state medical marijuana laws control and legalize its use. 3. Legalization may occur for marijuana as beverage such as alcohol or a medicine through federal government legislation. 4. Who says it's a perfect world, and marijuana is not going away. As with nicotine and alcohol, education is a starting point to protect the public from harmful effects of marijuana 5. Believe it or not, marijuana is highly addicting and its current unregulated high potency products are highly dangerous. Public health risks include but are not limited to addiction, psychosis and violence, adverse mental health and physical effects mental and legal and social consequences.

**Summary:** Marijuana is a substance that has been used for recreational purposes since ancient years and that is currently discussed to have a therapeutic or medical value and to be seen as a Medicine. According to the FDA, marijuana is classified as a Schedule I drug with high risk of addiction and no medical benefit. However, it is legal in several states for deliberating conditions eg various pain conditions, depression, anxiety, nail patella, glaucoma and even HIV. In addition people use is for various other conditions even though studies have shown greater harmful effects then benefit. Especially with marijuana, there is a high rate of misperception in the users. In addition, marijuana has a unique pharmacology and pharmacodynamics because of its more than 400 partially unknown components and

the storage in the users lipophilic tissues and redistribution long after the last use. The legalization of marijuana is already done in some states and other states are pressured to follow along. This article is a systematic review of literature analyzing the current policies, legal situations and trend as well as politics regarding marijuana and it's use. The article is focused on the natural form of the cannabis sativa plant

**Funding Sources:** None

## Poster 31: Kratom- A lethal drug on the rise

**Thersilla Oberbarnscheidt, MD, *University of Pittsburgh*; Norman Miller, MD, JD, *Augusta University***

**Background:** In Malaysia, Dutch botanist Pieter Korthals in 1831 first discovered Kratom or *Mitragyna speciosa*. Kratom is derived from the *Nitragyna speciose korth*, a tropical forest tree found in Malaysia, Thailand and Myanmar. The trees' leaves contain psychoactive opioid compounds, consumed for thousands of years. Kratom contains alkaloids that bind to opioid receptors, with an opioid drug structure. Kratom induces euphoria, and in lower doses acts similar to a stimulant by increasing energy, alertness, while in higher doses it induces sedation. Kratom is purportedly used for anxiety, depression, inflammation, libido. Importantly, given opioid activity, it suppresses opioid withdrawal. With regular use, Kratom is associated with dependence and addiction. Kratom is gaining increasingly popularity especially among the young in the US population and is causing rising numbers of ER visits, calls to poison control centers and even deaths related to multiple causes. There are currently very limited clinical studies available that demonstrate safety and efficacy in humans. Kratom The FDA has not approved Kratom for medical use and publishes warnings regarding its toxicity. Available information is mostly based on reports from users or animal models. Case reports involving the use of Kratom are concerning and alarming. Kratom is classified as an herbal supplement and therefore easily available to the user as it is sold in convenience stores, online or gas stations. At this point, it is a dangerous drug with opioid activity, freely available without controls for safety.

**Methods:** This poster is a systematic review of literature on the current available data on Kratom guided for physician and clinician education and to raise awareness about Kratom as a substance. Utilized sources were Pubmed, Ovid, Medline, PsychInfo, EMBASE.

**Results:** Kratom induces euphoria, and in lower doses acts similar to a stimulant by increasing energy, alertness, while in higher doses it induces sedation. Kratom is purportedly used for anxiety, depression, inflammation, libido. Importantly, given the opioid activity, it suppresses opioid withdrawal. With regular use, Kratom is associated with dependence and addiction. Kratom is gaining increasingly popularity especially among the youth in the U.S. population and is causing rising number of ER visits, calls to poison control centers and deaths.

**Conclusions:** Kratom is a substance that has been available for a long time especially in Asia that has certainly potent medical properties. However more research and clinical studies are needed to further investigate the properties of Kratom and toxicities. The reported toxic effects of Kratom that have been confirmed in animal studies are concerning. The pharmacology of Kratom appears very fascinating how it can act as a stimulant in low doses but then more as an opioid with sedation in higher doses. Not all chemically active ingredients are yet identified. There is more information to be learned about Kratom. Kratom might have some medical properties but unlike FDA approved medications, one sample is not the compatible with the next as the concentrations of active ingredients are varying from plant to plant. The legal availability makes Kratom and marijuana socially acceptable and is also easily accessible for the adolescents. There is no data available yet to look at the role of Kratom as a gateway drug and link to other consecutive substances. This is partially the case because only a very small fraction of Kratom

users reach out for medical treatment and get even identified. This has been a problem among substance use disorders in general for decades. Public education is a helpful tool to reach out and eventually prevent further damage. The increasing number of case reports and contact with patients in emergency rooms or poison control centers are alarming to raise a concern to further regulate the availability of Kratom and consider a change to federally controlled substance. The current trend and associated risk as well as the economical burden for medical care of kratom users, missed worked days and overall reduced psychosocial functioning are alarming.

**Summary:** Kratom is a substance that has been around for a long time but is nowadays gaining popularity. It is not federally regulated and available through the internet and smoke shops. It is commonly advertised for opioid withdrawal treatment in blots. For physicians it is a difficult substance to encounter with. Kratom won't show positive in regular drug screens and physician have often no knowledge regarding the treatment of kratom intoxication and withdrawal. It is important given the increasing numbers of Kratom related overdoses and calls to poison control centers to educated physicians and the general public about this substance.

**Funding Sources:** None

## Poster 32: How to identify "Buprenorphine Spiked" Urine Specimen in Buprenorphine Maintenance Clinic?

**Jagdeep Kaur, MD, MRO, FAPA, Keystone Health Center; Irakli Mania, MD, FAPA, Keystone Health Center**

**Background:** For the treatment of Opioid Use Disorder (OUD), buprenorphine is primarily prescribed in office-based clinical settings. Buprenorphine is a partial mu-opioid agonist that is used as maintenance therapy for OUD. Buprenorphine, buprenorphine-naloxone products are misused and diverted often. Close monitoring of treatment adherence is highly recommended for substance use disorders. Urine drug screen is the most common method to check treatment adherence. Urine drug screen is done to detect the presence or absence of licit, illicit substance as well as buprenorphine in the urine. There is a possibility of passing a screening urine test in the buprenorphine clinic by adding prescribed medication (Buprenorphine or Buprenorphine- Naloxone) in the urine. Further testing is required to confirm adulteration, and understanding those results is complex. Levels of buprenorphine (free and conjugated), norbuprenorphine (free and conjugated) and presence of naloxone in the urine can explain the urine adulteration. Free buprenorphine concentrations in the urine usually are quite low, and norbuprenorphine- glucuronide levels are the highest (1).

**Methods:** Electronic search of published review articles on buprenorphine drug testing and metabolism, case reports in Pubmed, Cochrane library, MEDLINE was done. Book chapters on buprenorphine metabolism were reviewed. Keywords: buprenorphine metabolism, norbuprenorphine, conjugated buprenorphine, conjugated norbuprenorphine, naloxone

**Results:** Urine specimens from patients reporting urine adulteration had significantly higher urine buprenorphine and lower norbuprenorphine levels than specimens from patients without reported or suspected urine adulteration (2). Buprenorphine  $\geq 700\text{ng/ml}$  offers the best accuracy for discriminating between adulterated and non-adulterated urine (2). Norbup:Bup  $\leq 0.02$  as an indication of urine adulteration. The presence of unconjugated naloxone can further confirm the suspicion of urine sample adulteration with Buprenorphine- Naloxone products (3). Buprenorphine is metabolized by a combination of N-dealkylation, via liver cytochrome p450 (CYP) 3A4 enzyme and glucuronidation (4). Its metabolites are buprenorphine-3-glucuronide (B-3-G), norbuprenorphine, and norbuprenorphine-3-glucuronide (NB-3-G) (5). Screening test (qualitative) for urine buprenorphine is done via immunoassay and confirmation test (quantitative) is done via gas chromatography-mass spectrometry (GC-MS) and liquid chromatography- tandem mass spectrometry (LC-MS/MS). Quantitative test results are for total buprenorphine (free buprenorphine+B-3-G) and total norbuprenorphine( free norbuprenorphine+ NB-3-G). Urinary elimination of norbuprenorphine-glucuronide was highest followed by buprenorphine-glucuronide and norbuprenorphine with little parent compound present in the urine. Free buprenorphine concentrations in urine are normally quite low and norbuprenorphine- glucuronide levels are the highest. Urine total norbuprenorphine levels were higher than total buprenorphine levels.

**Conclusions:** Following strict specimen collection procedures and/or direct observation is a foolproof way to stop adulteration and substitution. In clinical settings where respect for patient and non-invasion of patient privacy are the priorities, it is difficult to suspect a patient for cheating or diversion. Addressing the misuse and diversion of buprenorphine is must to improve treatment outcomes. Confirmatory testing needs to be ordered. The clinician should be trained to interpret quantitative test results. When in doubt, toxicologists should be consulted. Dialogue with the patient to explore the reasoning behind the "spiking" urine sample needs to be conducted in a non-judgmental manner. Being aligned with patient and possibly increasing level of care is in order in these instances as opposed to punitively discharging patients from the treatment program. Revisiting the treatment plan and making changes accordingly, e.g., frequent medication management visits and/or psychosocial counseling in addition to MAT.

**Summary:** For the treatment of Opioid Use Disorder (OUD), buprenorphine is available in a sublingual, buccal, subcutaneous implant and long-acting subcutaneous injection formulation. Urine drug screen is the most common test done in buprenorphine clinics to monitor adherence. Immunoassay tests are qualitative tests detecting free or conjugated buprenorphine in the urine. To pass the urine test patient can adulterate urine sample with buprenorphine or buprenorphine-naloxone products. The quantitative test is required to know levels of buprenorphine and its metabolite norbuprenorphine in the urine. Urinary elimination of norbuprenorphine-glucuronide was highest followed by buprenorphine-glucuronide and norbuprenorphine with little parent compound present in the urine. Free buprenorphine concentrations in urine are normally quite low and norbuprenorphine-glucuronide levels are the highest. Urine total norbuprenorphine levels were higher than total buprenorphine levels. Buprenorphine  $\geq 700\text{ng/ml}$  offers the best accuracy for discriminating between adulterated and non-adulterated urine. Norbup:Bup  $\leq 0.02$  as an indication of urine adulteration. The presence of unconjugated naloxone can further confirm the suspicion of urine sample adulteration with Buprenorphine-Naloxone products.

**Funding Sources:** None

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## Poster 33: Ibogaine Therapy for Acute Opioid Withdrawal and Long-Term Abstinence: A Review of the Evidence

**Zachary Poliacoff, MS4**, *University of South Florida Morsani College of Medicine*; **Shixie Jiang, MD**, *University of South Florida*

**Background:** The United States is in the midst of an opioid abuse epidemic, and despite increasing public awareness and government efforts in recent years the problem continues to worsen. The CDC estimates that there was a 2.5-fold increase in opioid overdose deaths from 2007 to 2017, from 18,515 per year to 47,600 per year. Overdoses from cocaine and benzodiazepines without the involvement of opioids, by contrast, have remained stable over this same period. Current interventions are focused on preventing opioid abuse and rehabilitating dependent users. The primary medications used in rehabilitation include methadone, buprenorphine, and naltrexone. However, these treatment modalities are limited by restricted availability, high rate of relapse, and inability to address the psychological factors of addiction. Identifying new methods for combating opioid dependence are of paramount importance. One promising treatment is the use of ibogaine in mediating withdrawal symptoms and reducing long term relapse rates. Ibogaine is a naturally-occurring psychoactive substance found in several species plants in the Apocynaceae family. In the US, Ibogaine HCl has been patented for rapid interruption of narcotic addiction syndrome, but is classified as a schedule I substance. It acts at numerous sites, including multiple opioid receptor subtypes, NMDA receptors, serotonin uptake sites, and reduces the opioid-mediated efflux of dopamine. Because studies on the effects of ibogaine on opioid dependence in humans are limited, it is therefore important to assess the current evidence and determine if the literature supports the use of ibogaine for the treatment of opioid abuse.

**Methods:** A literature review was performed on PubMed and Google Scholar using the search string “ibogaine detoxification”. We examined 168 articles and included seven that examined the effects of ibogaine on either short-term withdrawal symptoms or long-term abstinence in humans. Case reports and articles that solely evaluated the effects of ibogaine on other forms of non-opioid substance abuse, ibogaine’s effects on subjective mood, and ibogaine in animal models were excluded.

**Results:** All seven studies assessed the attenuating effects of ibogaine administration on opioid withdrawal symptoms after discontinuation of an opioid maintenance regimen. No study administered opioids after administration of ibogaine. Four studies used a single dose of ibogaine, while three studies administered ibogaine over 24-96 hours. Five of these studies used clinically validated measures of withdrawal severity such as the Subjective Opioid Withdrawal Scale (SOWS), Clinical Opioid Withdrawal Scale (COWS), or Objective Opioid Withdrawal Scale (OOWS). All studies reported significant decreases in subjective and/or objective symptoms of withdrawal following ibogaine administration. Two studies found that 76% and 78% of participants did not demonstrate objective signs of opioid withdrawal 24 and 48 hours after intervention respectively. No study reported any participant dropout during the withdrawal period. However, two participants across the seven studies died within 24 hours of intervention, possibly due to the cardiotoxic effects of ibogaine. Three studies assessed abstinence at one year following ibogaine administration and found 23-



54% of participants were opioid-free at twelve months, although the number of participants who received naltrexone therapy over this period was not reported. One study found that 31% of participants were abstinent for at least two years following treatment. One study which assessed long-term subjective mood with the Beck Depression Inventory (BDI) found a significant decrease in BDI score at 12 months. Studies which assessed participant attitudes towards ibogaine therapy found that a majority of participants believed treatment was an overall positive experience. One study reported increased satisfaction with ibogaine treatment compared to other medically assisted withdrawal modalities.

**Conclusions:** The evidence assessed by this review is uniformly in favor of the use of ibogaine therapy in ameliorating acute opioid withdrawal symptoms. Critically, no study reported any participants who dropped out during the acute withdrawal period. By contrast, the dropout rate during medically assisted withdrawal has been found to approach 50% under ideal conditions using buprenorphine or methadone in the inpatient setting, the current best practices in medically assisted withdrawal modalities. Ibogaine also requires a significantly less intensive dosing schedule and shorter treatment duration than these alternatives, and many study participants treated with ibogaine experienced only mild or no withdrawal symptoms. Evidence for its benefit in facilitating long-term abstinence is also positive but more limited. The current literature cannot be taken as unequivocal support for ibogaine therapy due to widespread methodological issues such as a lack of experimental controls and inconsistent reporting methods. Without appropriate controls, it is difficult to draw conclusions about whether ibogaine represents an improvement in medically assisted withdrawal compared to buprenorphine and methadone. Furthermore, the deaths associated with ibogaine therapy indicate that more research is necessary to determine optimal dosing strategies and contraindications to use. These issues with the extant literature on ibogaine's use in addiction therapy are likely a consequence of the drug's status as a schedule I substance in the US. Given the severity of the current opioid crisis and the apparent benefit of ibogaine in mediating withdrawal in these preliminary studies, however, further investigation is warranted. We suggest loosening restrictions on ibogaine for investigational purposes and further studies directly comparing the efficacy of ibogaine, buprenorphine, and methadone in facilitating medically assisted withdrawal as measured by the severity of withdrawal symptoms during treatment and treatment completion rates.

**Summary:** The ongoing opioid epidemic has not responded to current interventions aimed at rehabilitating opioid abusers, in part due to the difficulties posed by opioid withdrawal syndrome. Ibogaine, a naturally occurring, psychoactive, schedule I substance, has been implicated in ameliorating withdrawal symptoms and increasing rates of long-term abstinence. Although the current literature provides evidence of a positive effect, all extant studies are limited by methodological issues that make drawing specific conclusions difficult. Nevertheless, given the promise ibogaine shows in the preliminary studies examined by this review, we suggest loosening restrictions on ibogaine and propose further studies directly comparing the efficacy of ibogaine, buprenorphine, and methadone in facilitating medically assisted withdrawal.

**Funding Sources:** None

## Poster 34: Incident Risk of Unintentional Opioid Overdose Deaths is Associated with Incident Intentional Death by Suicide: A Public Health Imperative

**Lawrence Adler, MD**, *Clinical Insights, Inc.*; **Nithin Krishna, MBBS**, *University of Maryland School of Medicine*

**Background:** Mortality from unintentional opioid overdoses and suicide mortality have both been increased dramatically over 2013 to 2017 in the United States; suicide is the tenth leading cause of death in the United States. The CDC reports that these deaths substantially contribute to decreased life expectancy and represent a public health challenge. Data from the CDC Wonder database indicates a very significant geographical county-level correlation of incident suicide mortality and incident mortality from opioid overdoses. Addiction psychiatry and addiction medicine specialists are familiar with the importance of secondary prevention of harmful substance and alcohol use in their evaluation of patients (eg, NIDA-Quick screen). However the CDC data suggests that screening for suicidal ideation and behavior using a validated screening instrument would be useful in detection of persons at risk for suicide. Although addiction psychiatry specialists are well-aware of the importance of diagnosing co-morbid psychiatric disorders in their patients, death by suicide also occurs in persons who are not suffering syndromal psychiatric illnesses. This preventive screening enhances both the clinicians' practices and enhances the destigmatization of both addictive disorders and of suicidal thoughts and behaviors.

**Methods:** EMBASE, Medline Health, and PubMed were queried utilizing search parameters [Opioid AND Overdose], [Opioid AND Suicide], [Opioid AND Neurobiology], [Addiction AND Neurobiology], [Pain AND Suicide]. In addition, open source data from the Centers for Disease Control and preliminary epidemiologic analyses of suicide rate and opioid overdose deaths at a granular U. S. population level were reviewed.

**Results:** Incident suicide and incident death by opioid overdose are increasing rapidly, reflecting a public health crisis.

-Suicides increased from 44,965 to 47,143 from 2016 to 2017, a 4.8% increase.

-Opioid overdose deaths increased 42,249 to 47,600 during that period, a 12.7% increase.

-During that period, deaths from synthetic opioids (excluding methadone) increased from 19,413 to 28,466, a 46.6% increase.

-The increase in deaths from synthetic opioids appears to be driven by illicitly manufactured fentanyl.

The CDC Wonder database was analyzed to study incident suicide at a county level across the United States. This analysis demonstrated a "suicide belt" in the intermountain western U. S. which displayed significant overlap with the CDC map of opioid overdose deaths. Analysis utilizing geographic weighted regression demonstrated that mortality due to drug overdose was a significant explanatory variable for incident suicide.

**Conclusions:** 1. For clinical practice, these results emphasize the importance for enhanced screening for suicidal ideation and behaviors.

2. A significant research implication is that there may be convergent neurobiologic substrates in opioid use disorders and in suicide. There exists current evidence that dysregulated anti-reward systems (lateral habenula) may be involved in the misery of opioid dependence and the despair underlying death by suicide.

3. These issues should be incorporated into the education of students, residents and practitioners.

4. More broadly, school education and education of families would enhance primary prevention and secondary prevention of death by suicide.

5. At a policy level, stigma must be reduced. If persons remain reluctant to discuss suicide and to discuss substance use, preventive approaches will be hampered.

**Summary:** This presentation proposes enhanced screening for suicidal ideas and behaviors by addiction psychiatry specialists given the rapid increases in the mortality from opioid overdose deaths and its geographical correlation to deaths by suicide. Research should focus on designing valid and reliable screening instruments. Furthermore, continued research into converging neurobiology should be pursued. Education and policy should focus on destigmatization.

**Funding Sources:** None

## Poster 35: Is Maternal Kratom Use associated with Neonatal Abstinence Syndrome: A review

**Souparno Mitra, MD**, *BronxCare Health Systems*; **Sanya Virani, MD, MPH**, *Maimonides Medical Center*

**Background:** Kratom (*Mitragyna speciosa*) is a herb native to Southeast Asia which has been in use for aeons for pain relief and mood enhancement. It is traditionally consumed as a beverage or by chewing leaves. The active ingredients found in kratom include mitragynine and 7-hydroxymitragynine. In the United States (US), kratom, which is available as a supplement, has become popular for controlling withdrawal symptoms from opioid cessation. However, the FDA has issued several warnings about the safety of kratom containing products. Case studies have alluded to the occurrence of features of Neonatal Abstinence Syndrome (NAS) in infants born to mothers who regularly used Kratom. Our poster reviews case reports where this association was observed.

**Methods:** A comprehensive literature was conducted using Pubmed and Google Scholar with a combination of keywords “Kratom AND pregnancy”, “Kratom AND maternal”, “Kratom AND neonatal”, “Kratom AND newborn”, “Mitragyna AND pregnancy”, “Mitragyna AND maternal”, “Mitragyna AND neonatal”, “Mitragyna AND newborn”. As part of the inclusion criteria, the primary focus was on maternal use of kratom and its consequences in humans i.e. pregnant mothers and neonates. 8 unique abstracts were identified and reviewed.

**Results:** The reviewed papers suggest that infants exposed to Kratom via the transplacental route exhibit symptoms such as breathing difficulties, irritability, jitteriness, muscle hypertonicity, and a high-pitched inconsolable cry which are features of NAS. Though no treatment protocols exist for managing kratom withdrawal, the studies suggested symptomatic management of a hyper-adrenergic state. Some studies recommended using methadone, while others recommend use of morphine, rooming-in and close contact with the mother.

**Conclusions:** The association of Kratom use in mothers and the occurrence of features of NAS in neonates is anecdotal at best and further research is required to identify Kratom as a causative agent and quantify the frequency and dosing of use which may be associated with the development of such symptoms. If causation is established, further research may be required to develop treatment protocols. Antenatal review of “complementary and alternative medications” including Kratom and counselling regarding potential effects of such medications should be discussed with expectant mothers.

**Summary:** To the best of our knowledge, no formal clinical trials exist that examine safety or efficacy of Kratom in managing opioid withdrawal. In fact, Kratom has been known to cause dependence and adverse withdrawal symptoms itself. Adverse effects of Kratom have been well-researched and recommendations for its regulation need to be considered as Kratom keeps gaining popularity as a supplement.

**Funding Sources:** None

## Poster 36: It's not just what you do, it's how you do it: Variation in substance use screening outcomes with commonly used screening approaches in primary care clinics

**Timothy Wilens, MD**, *Massachusetts General Hospital, Harvard Medical School*; **Jennifer McNeely, MD, MS**, *NYU School of Medicine*; **Joseph Kannry, MD**, *Icahn School of Medicine at Mt. Sinai*; **Richard Rosenthal, MA, MD**, *Renaissance School of Medicine at Stony Brook University*; **Sarah Wakeman, MD, FASAM**, *Massachusetts General Hospital, Harvard Medical School*; **Sarah Farkas, MD**, *NYU School of Medicine*; **Angeline Adam, MD**, *NYU School of Medicine*; **Carmen Rosa, MS**, *National Institute on Drug Abuse (NIDA)*; **Aimee Wahie, MS**, *The Emmes Corporation*; **Seth Pitts, BS**, *The Emmes Corporation*; **John Rotrosen, MD**, *NYU Langone*

**Background:** Primary care clinics often struggle to choose the approach to alcohol and drug screening that is best suited to their resources, workflows, and patient populations. We are conducting a multi-site study to inform the implementation and feasibility of electronic health record (EHR)-integrated screening.

**Methods:** In two urban academic health systems, researchers worked with stakeholders from 6 clinics to define and implement their optimal screening approach. All clinics used single-item screening questions for alcohol/drugs followed by AUDIT-C/DAST-10. Clinics chose between: (1) screening at routine vs. annual visits; and (2) staff-administered vs. computer self-administered screening. Results were recorded in the EHR, and data was extracted quarterly to describe implementation outcomes including screening rate and detected prevalence of unhealthy (moderate-high risk) use among those screened. Findings are from the first 3-12 months post-implementation at each clinic.

**Results:** Across sites, of 84,311 patients with primary care visits, 58,492 (69%) were screened. In the 4 clinics with mature (9-12 months) implementation, screening rates ranged from 42-95%. Rates were lower (10-22%) in the 2 clinics that recently launched. Screening at routine encounters, in comparison to annual visits, achieved higher screening rates for alcohol (90-95% vs. 42-62%) and drugs (90-94% vs 38-60%). Staff-administered screening, in comparison to patient self-administered screening, had lower rates of detection of unhealthy alcohol use (2% vs. 15-37%). Detection of unhealthy drug use was low, ranging from 0.3-1.5%.

**Conclusions:** EHR-integrated screening was feasible to implement in at least 4 of the 6 clinics; 1-year results (available Fall 2019) will determine feasibility at all sites. Self-administered screening at routine primary care visits achieved the highest rates of screening and detection of unhealthy alcohol use. Although limited by differences among clinics and their patient populations, this study provides insight into outcomes that may be expected with commonly used screening strategies in primary care.

**Summary:** This multi-site study conducted in the NIDA Clinical Trials Network seeks to inform the implementation and feasibility of electronic health record (EHR)-integrated screening for substance use in primary care. This study will provide insight into outcomes that may be expected with commonly used screening strategies in primary care and may assist in fine-tuning the most appropriate approach to

alcohol and drug screening best suited for primary care clinics, based on their individual resources, workflows, and patient populations.

**Funding Sources:** Supported by National Institute on Drug Abuse cooperative awards: U10DA013035, UG1DA013035, and UG1DA015831

## Poster 37: Psychiatric Profiles of Young People with Autism Spectrum Disorder with and without Substance Use Disorders

**Timothy Wilens, MD**, *Massachusetts General Hospital/Harvard Medical School*; **Benjamin Isenber, BA**, *Massachusetts General Hospital and Vanderbilt University*; **Marykate Martelon, MPH**, *Massachusetts General Hospital and Massachusetts Department of Public Health*

**Background:** Although Substance Use Disorders (SUD) and Autism Spectrum Disorder (ASD) are highly comorbid with other psychiatric disorders and commonly onset early in life, little research has been conducted on their overlap. The simultaneous presence of these disorders can complicate and undermine standard treatments highlighting the need for a more nuanced understanding of this population. The present study sought to compare the psychiatric profiles of young people with ASD to young people with ASD and SUD to better elucidate similarities and differences between these two groups and potentially identify predictors of SUD in ASD.

**Methods:** Blinded structured interviews were conducted with 63 young adults with ASD seeking psychopharmacological care in an outpatient psychiatry clinic. The blinded structured interviews assessed for comorbid psychiatric conditions, substance use and SUD, and academic, cognitive, and global functioning. Conduct disorder, which typically has diagnostic criterion pertaining to substance use, was assessed independently from substance use in this study. Multivariate logistic regression controlling for age was used to analyze the associations between group (ASD vs. ASD + SUD) and psychiatric comorbidity.

**Results:** The study sample consisted of 42 subjects with ASD (average age  $26.2 \pm 8.9$  years, 64% male and 97% Caucasian) and 21 subjects with ASD and SUD (average age  $35.2 \pm 12.6$  years, 67% male and 90% Caucasian). No significant differences in rates of depression, psychosis, oppositional defiant disorder, attention-deficit/hyperactivity disorder, anxiety disorders, academic, cognitive, and global functioning were found. Individuals with ASD and SUD were significantly more likely ( $p = .002$ ) to smoke cigarettes (29%) than those with ASD only (5%), and were also significantly more likely ( $p = .03$ ) to have conduct disorder (25%) than those with ASD only (5%).

**Conclusions:** These data indicate that overall, patients with ASD with and without comorbid SUD have similar psychiatric profiles. These data also suggest that conduct disorder, a well-studied predictor of SUD in neurotypical populations, may also predict the development of SUD in individuals with ASD. Because conduct disorder typically onsets in childhood, prior to initiation of substance use, it may be an indicator of increased risk for future SUD in individuals with ASD. These findings highlight the importance of assessing for conduct disorder in youth with ASD, a comorbidity that may be overlooked when treating this population. Smoking was also significantly more prevalent in the ASD and SUD group, however, from these data we cannot determine whether cigarette smoking precedes SUD in ASD populations, occurs in tandem with SUD, or onsets following the development of SUD as smoking age of onset was not assessed for.

**Summary:** This study sought to compare the psychiatric profiles of young people with autism spectrum disorder (ASD) with and without comorbid Substance Use Disorder (SUD) to identify potential predictors of SUD in individuals with ASD and to better inform future treatment and prevention strategies. The findings of this study indicate that conduct disorder might predict the development of SUD in young people with ASD and should therefore be assessed for in ASD treatment settings and targeted in prevention efforts.

**Funding Sources:** None



## Poster 38: Knowledge and Attitude Changes Towards Opioid Use Disorder and Naloxone Use Among Medical Students

**Tabitha Moses, MS**, *Wayne State University School of Medicine*; **Rafael Ramos, MS**, *Wayne State University School of Medicine*; **Michael Garmo, BS**, *Wayne State University School of Medicine*; **Eva Waineo, MD**, *Wayne State University School of Medicine*; **Mark Greenwald, PhD**, *Wayne State University School of Medicine*

**Background:** Overdose is the leading cause of preventable death in the USA. There have been efforts to distribute naloxone as a tool for harm reduction to those who need it; however, negative attitudes of healthcare workers and lack of knowledge may impact distribution. Medical schools have begun training students in opioid overdose prevention and treatment; initial studies found trainings improve student knowledge in responding to overdoses, but it remains unclear whether the traditional curriculum contributes to this knowledge. The present study aimed to evaluate baseline medical student knowledge about opioids, opioid overdoses, and naloxone use.

**Methods:** We distributed 15-minute online surveys via the email lists of all 4 classes at the Wayne State University School of Medicine as part of a wider initiative on Opioid Overdose Prevention and Response Training. Student participation was voluntary and confidential. These baseline surveys included questions about past experiences and knowledge of opioid use disorder (OUD) and overdoses, clinical experiences, and attitudes towards patients with OUD. These were assessed with the validated Opioid Overdose Knowledge (OOK), Opioid Overdose Attitudes, and Medical Conditions Regard Scales (adapted for Substance Use Disorders [SUDs]).

**Results:** 252 students (29.0% M1, 25% M2, 21.8% M3, 24.2% M4) completed the survey. We found differences in total knowledge (OOKS) across class years (M1  $44.68 \pm 4.86$ , M2  $48.05 \pm 4.62$ , M3  $47.24 \pm 5.22$ , M4  $49.37 \pm 4.29$ ;  $F(3,251)=11.8$ ;  $p<.001$ ), although within subsections of the measure there were no differences between class years. Students with more clinical experience (e.g. M4s) scored higher on the subscales regarding naloxone use and signs of an opioid overdose; scores for the opioid overdose risk factor subscale and the actions in an overdose subscale did not differ between classes. Improvements across measures of opioid overdose attitudes were also found across class year ( $F(3,251)=4.2$ ;  $p=.006$ ). Notably, students in the final year of training scored lower on certain subscales of the Medical Conditions Regard Scale, indicating less willingness to work with patients with SUDs. We also identified interest in medication treatment and naloxone trainings should these opportunities arise.

**Conclusions:** The results highlight how gradual exposure to knowledge and activities concerning OUD through clinical experience improve student knowledge and overall attitudes regarding opioid overdose. Improving this knowledge-base earlier in the undergraduate medical curriculum by complementing volunteering opportunities with additional training sessions such as the buprenorphine-waiver training program or in-house naloxone training is believed to improve attitudes, knowledge, and confidence prior to starting clinical rotations. Unfortunately, results also showed more negative attitudes among students with more clinical experience (M4s) towards patients with SUDs. This indicates a need for further training during clinical years and education of best ways to respond positively when working

with this patient population. These findings support a continued, integrated curriculum on OUD and naloxone in medical education with a need for an improved focus on methods to improve students' attitudes toward patients with OUD.

**Summary:** The present study aimed to evaluate baseline medical student knowledge about opioids, opioid overdoses, and naloxone use. As a point of focus, the study aimed to identify how people's knowledge in areas and attitudes towards patients differed depending on their medical school training. Variables such as volunteering clinical experiences and whether students were in the pre-clinical or clinical portion of their training were noted with the aim of identifying the best way to complement the curriculum at Wayne State University School of Medicine for training professionals capable of understanding and treating a population dealing with SUDs.

**Funding Sources:** None

## Poster 39: HHEB Project(Housing, Health and Employment Improvements with Buprenorphine)

**Nauman Ashraf, MD**, *Ozark Center Psychiatry Residency Program*; **Raquel Reno, BSW**, *Ozark Center's Turnaround Ranch*; **Lisa Watson, CPS, CRPR**, *Ozark Center's Turnaround Ranch*; **Allison Smith, DO**, *Ozark Center's Turnaround Ranch*

**Background:** Buprenorphine is an evidence-based medication-assisted treatment used to treat Opioid Use Disorder (OUD). It has shown to improve the quality of life for patients in treatment for OUD. The benefits of this medication go beyond just the individual treated. The Buprenorphine Outpatient Outcomes Project (BOOP) is a study conducted in Maryland aimed to assess the quality of life in buprenorphine patients. The results from this study demonstrate that OUD patients that are prescribed buprenorphine and actively engage in therapy have decreased rates of hospitalization, decreased legal charges, and better quality of life (Sittambalam et al., 2014). Aside from benefiting the individual, the cost-benefits from the results improve the quality of the community. Anecdotal evidence provided by our patients has suggested significant and lasting improvements in the quality of life for patients, their families, and the community as a whole. We are seeking to do a retrospective study to compile data from our quantitative survey given to the patients in the month of April 2019, enrolled in the New Directions Buprenorphine Program at Ozark Center. The quantitative survey asks questions about participant's engagement in meaningful employment as well as the duration of employment, access to quality housing and duration of housing status, and access and participation in healthcare services to address medical conditions outside of an emergent setting and to access regular preventative monitoring and treatment of health conditions.

**Methods:** Retrospective Study was conducted to review our brief quantitative surveys provided to most patients engaged in the buprenorphine treatment at our New Directions outpatient clinic to track their progress. The questionnaire specifically asked questions about housing status and duration, employment status and duration, correlation with treatment, meaningful activities for unemployed participants, primary care status before and after treatment, medical screening and treatments for high maintenance health conditions and communicable diseases. We reviewed our quantitative surveys to report rates of improvement in the above-mentioned categories compared to the rates prior to engagement in the Buprenorphine clinic. The data obtained was compared to the preexisting state and national data to determine quality improvements.

**Results:** A total of 100 participants were included in the study. Of those who participated, 51% reported current employment which is almost double the 2015 Treatment Episode Data Set (TEDS, 2018) discharge data at 26.3% employment at discharge from an outpatient medication-assisted opiate therapy. From the 51% employed, 72.5% gained meaningful employment while in treatment as opposed to the increase of 24% employment during treatment (Parran et al., 2009). The remaining 49% reported being unemployed. Within the 49%, almost half (46.9%) reported having a disability prohibiting them from working 12% lower than the 2015 TEDS (2018) at discharge. In comparison, 40.8% are actively seeking meaningful employment, also 12% lower than the 2015 TEDS (2018) at discharge. Of those who

are unemployed, 71.4% are giving back to the community via participation in various activities and philanthropy. In addition to giving back to the community, an improvement in the quality of life was indicated as almost half of the participants (45%) reported being homeless prior to entering into treatment, with an outstanding drop of 14%, compared to the TEDS (2018) reported drop of only 0.6%, only 31% reported a current homeless status. The 14% decrease of homelessness was reflected in a 14% increase in participants who are currently renting their residence. Maintaining the trend of quality life improvement is sustained in the domain of participant's healthcare. Prior to treatment, only one-third of participants reported having a primary care physician (PCP). PCP utilization has increased to two-thirds of participants since engaging in treatment. Further health care reports since engaging in treatment, illustrate screening and treatment for high maintenance health conditions and communicable diseases. A staggering 56% of participants reported being tested for either high maintenance health conditions, such as hypertension, diabetes, or cirrhosis, or communicable diseases, such as hepatitis B and C, HIV, AIDS, and other STI's, with 26% then receiving treatment for their conditions. The primary objective of the study was to assess the quality of life prior to and after engaging in treatment with Buprenorphine treatment and the secondary outcome effect for the community.

**Conclusions:** The summary of our data concludes that participants are improving their lives, as well as, improving the quality of life for the community since engaging in treatment utilizing buprenorphine treatment. Participants are contributing to the economy of the community by becoming rental tenants, gaining employment, and decreasing healthcare risks by seeking screening and treatment for healthcare needs, therefore, lowering emergent healthcare costs. In addition to contributing to the economy, they are also participating in community-based events. The benefits of treatment utilizing buprenorphine appear to surpass the individual and permeate into the community as a whole.

**Summary:** This is a quality improvement project and we looked at improvement in patients housing, employment and healthcare pre and post buprenorphine treatment. Patient with opioid use disorder struggle with maintaining good general health, stable housing and employment. Our data shows that buprenorphine treatment not only helps these patients get treatment for their opioid use disorder but also help them make significant improvement in their housing, employment and healthcare, which is always the bigger goal of any treatment to make a meaningful positive change in patients' lives. It has a great impact on reducing health care burden if people are healthier and employed, and help inform future research and public health policies.

**Funding Sources:** None

## Poster 40: Kratom and Hepatotoxicity – A Case and Review of Literature

**Do Hyung Kim, DO**, *University of Kansas Medical Center*; **Dheepthi Ravishankar, MBBS**, *University of Kansas Medical Center*; **Roopa Sethi, MD**, *University of Kansas Medical Center*

**Background:** Kratom (*Mitragyna speciosa*) is a tropical plant native to Southeast Asia whose analgesic properties have gained popularity in the United States as an alternative to opioids. It is postulated to work as a stimulant and as an analgesic making it a desirable substance of abuse. The use of kratom has been on the rise in the United States due to its wide availability and affordability despite the limited knowledge of its safety profile. Kratom products are sold in various forms and are available through online stores, gas stations or local smoke shops. Kratom has been linked to multiple reports of seizure, coma, hepatic injury and death raising concern for its safety and lack of regulation. There is increasing suspicion that this recreational substance may be harmful to the liver. In this report, we illustrate cases of kratom induced hepatotoxicity to keep our patients and providers well-informed and to protect our patients from possible harm.

**Methods:** We present a case of acute liver injury in a 34 year old male with a history of opioid use disorder who presented with two days of nausea, vomiting, right upper quadrant pain, dark urine and jaundice. He reports having consumed up to 28 kratom capsules per day for 3 months prior to admission to combat his opioid craving. We outline the workup, his hospital course and treatment. We also summarize published case reports of kratom hepatotoxicity. PubMed, CINAHL, EBSCO databases were searched up to May 2019 with key terms “kratom”, “*Mitragyna speciosa*”, “liver injury”, “hepatitis”, “hepatotoxicity” and “opioid use disorder” in human. This led to a total of 10 case reports of kratom-induced hepatotoxicity for review.

**Results:** Our laboratory and imaging workup revealed that while our patient most likely suffered acute liver injury from reinfection with hepatitis C, underlying liver damage from his frequent kratom use cannot be ruled out. Collated data from case reports illustrate similar chief complaints consisting of jaundice, abdominal pain and dark urine. These published cases demonstrate kratom induced liver injury by liver biopsy in the absence of confounding factors, suggesting kratom as an independent risk factor for hepatotoxicity.

**Conclusions:** Although the available literature on kratom is limited, there is growing evidence this substance can lead to hepatotoxicity necessitating emergent medical treatment. We highlight the significant danger associated with kratom to increase awareness and recognition for clinical manifestations of kratom induced hepatotoxicity. Although vast majority of patients were treated supportively in published reports, two cases interestingly made use of N-acetylcysteine and ursodeoxycholic acid with improvement in liver function. Kratom’s toxic effects on liver have been demonstrated in murine models; however further research is required to elucidate the mechanism of kratom induced hepatotoxicity as well as to explore alternative methods of treatment.

**Summary:** In this report, we present a case of acute liver injury in a kratom user and review published case reports of kratom induced liver injury. This underscores the need for complete history taking including over the counter recreational products as many substances including kratom are not detected on routine urine drug screen. More knowledge on kratom will help clarify its the potential benefits vs. dangers.

**Funding Sources:** None

## Poster 41: Management of Benzodiazepine Refractory Delirium Tremens: A Review

**Shixie Jiang, MD**, *University of South Florida*; **Chemar David, MS4**, *University of South Florida*; **Zachary Poliacoff, MS4**, *University of South Florida Morsani College of Medicine*; **Benjamin Spurling, MD**, *University of South Florida*

**Background:** Alcohol use disorders are maladaptive patterns of severe alcohol consumption that can lead to innumerable health conditions and consist of the most serious drug abuse problems in our country. Alcohol withdrawal syndrome occurs within hours to days after cessation or significant reduction in usage. The most severe form is known as delirium tremens, which can occur in 5% of alcoholics and may have mortality rates as high as 15% if unresolved. Its symptoms include confusion, mental status changes, perceptual disturbances, agitation, and autonomic hyperactivity. Typical management includes loading of benzodiazepines, most commonly lorazepam, chlordiazepoxide, or diazepam. However when these options fail or cannot be utilized, there exist no definitive guidelines on further treatment regimens. The following is a review of the literature that investigates alternative treatment paradigms for delirium tremens.

**Methods:** A search of relevant literature was conducted on PubMed using the MeSH term combinations of “delirium tremens,” “benzodiazepine,” “alternative,” “refractory,” and “treatment.” In addition to this, a search and review was conducted on clinicaltrials.gov using the phrase “delirium tremens,” to identify and review ongoing novel management studies.

**Results:** The PubMed search yielded 36 results of which 12 papers consisting of reviews, clinical trials, and feasibility studies were deemed appropriate for this review. The dates ranged from December 1997 through November 2017. Alternative medications studied involved the usage of phenobarbital, propofol, dexmedetomidine, haloperidol, and ketamine. The most amount of data available was for phenobarbital, propofol, and dexmedetomidine, the least involving ketamine. Study design involved identification of benzodiazepine refractory delirium as, “persistent CIWA-Ar >25, frank delirium or inability to control symptoms despite medication, requiring 200mg or more in the initial 3 hours or 400mg or more in the initial 8 hours for diazepam, and/or 30mg or more in the initial 3 hour or 60mg or more of lorazepam in the initial 8 hours.” Phenobarbital was the only agent consistently used successfully as monotherapy. Other agents were mostly given as adjunctive agents with decreased agitation as well. Utilization of these agents showed primary outcomes consisting of similar time to resolution of symptoms, increases/decreases in intubation time, decreased severity and rates of agitation, and ICU and hospital LOS. In terms of symptomatic and especially agitation control, each agent was demonstrated to be efficacious when given adjunctively with a benzodiazepine; however side effects including bradycardia, seizures, QTc prolongation, and respiratory depression were findings reported by the authors. A search of “delirium tremens,” on ClinicalTrials.gov revealed 4 current clinical trials for alternative management protocols, conducted in the United States, France, and Mexico.

**Conclusions:** Despite diversity in study design, primary outcomes, dosages, treatment duration, and patient populations, the literature revealed that there are efficacious adjunctive treatments to delirium

tremens in benzodiazepine refractory situations. No strong evidence was substantiated for monotherapy. The major caveats of these agents are reflected by the different types of significant side effects accompanying each of them.

**Summary:** Overall, the current evidence reveals several options for medications that can be used to control severe cases of benzodiazepine refractory delirium tremens. No suitable monotherapy has been identified yet; however these adjunctive therapies have been associated with efficacious rates of symptomatic control despite their notable side effects. In the future, more studies involving newer agents such as dexmedetomidine and ketamine could be conducted for such alcohol withdrawal delirium and even in milder cases of alcohol withdrawal to prevent such precipitation even.

**Funding Sources:** None



## Poster 42: Medication Assisted Treatment in Alcohol Use Disorder: Can Education and EMR interventions increase prescriptions?

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**Background:** Alcohol Use Disorder (AUD) is a problem among US veterans with more than 40% of veterans having a lifetime history of alcohol use disorder. VA guidelines recommend medication-assisted treatment (MAT) in the treatment of moderate to severe AUD. These medications include Naltrexone, Acamprosate, Disulfiram, and Topiramate. Despite this recommendation, they are underutilized. VA administrative data reveals that during the last quarter of 2017, 9.24% of patients with AUD in the Detroit VA received MAT compared to a national average of 10.5%. Our first PDSA cycle introduced a survey to psychiatrist and psychiatry residents to identify barriers, perceptions, and practices to using MAT in AUD. This survey assessed the most common medications that were prescribed for AUD. Our survey also gathered information regarding physician preference for sustainable interventions that may lead to increased rates for prescribing MAT. A local survey of VA psychiatrists suggested two barriers to MAT: patients' lack of interest and psychiatrists' lack of perceived effectiveness. Provision of education and Electronic Medical Record (EMR) alerts to prescribe MAT were the preferred Quality Improvement (QI) interventions to increase MAT.

**Methods:** The project was conducted at the outpatient psychiatry clinic in the Detroit VA hospital between March-August 2018. Interventions targeting psychiatrists were developed based on the survey and implemented in March 2018. The questionnaire was self-administered, followed by a brief unstructured interview for qualitative data. The survey was a 6-item questionnaire distributed to 10 psychiatrists and 12 psychiatry residents at the Detroit VA in January 2017. We assessed rates at which MAT was offered and prescribed. We enquired about common barriers faced while prescribing MAT as well as factors influencing decisions to prescribe MAT. A list of 249 patients with alcohol-related disorders that may benefit from MAT was generated, and psychiatrists received a seminar on MAT guidelines and a course on motivational interviewing. Patients charts were then tagged with an EMR alert reminding psychiatrists to consider MAT. Post audit data was gathered in August 2018.

**Results:** Of the original 249 patients, 124 (50%) were seen as routine follow up between April to August 2018. During this period 56 (45%) were offered MAT, out of which 40 patients (71%) declined. Of those receiving MAT, 10 patients received Naltrexone and 5 received Acamprosate. A total of 69 patients (56%) received a referral to substance abuse program. Naltrexone was the most preferred medication overall. Although Gabapentin was equally preferred by psychiatrists, it is not considered first line by VA DoD guidelines for treating AUD. Among psychiatrists, most common barrier to prescribe MAT was lack of compliance whereas residents' primarily cited a lack of experience. The most important factor

influencing prescription of MAT was patient willingness to take the medications and a willingness to quit alcohol.

**Conclusions:** MAT treatment for AUD is underutilized, nationally and in Detroit. Our intervention increased the number of people treated with MAT by 12% over a period of 5 months. Reasons for not meeting our goal include (1) guidelines recommend MAT in cases of moderate to severe AUD (per DSM-5), whereas the VA system uses the ICD system that does not have an analogous diagnosis, (2) psychiatrist turn-over, (3) patient preference, and (4) referral to substance abuse treatment program. This latter point may suggest a reluctance to prescribe altogether, the findings suggest a need for booster sessions in motivational interviewing, provider education on MAT and patient education programs to meet VA guidelines.

**Summary:** We present a Quality improvement initiative that aimed to increase the number of Medication Assisted Treatment (MAT) prescriptions by 15% over 5 months in a sample of veterans. Provision of education and Electronic Medical Record (EMR) alerts were the preferred Quality Improvement (QI) interventions to increase rates of MAT prescriptions. Our intervention increased the number of people treated with MAT by 12% over a period of 5 months.

**Funding Sources:** None

## Poster 43: Multi-dimensional approach in Substance Use Disorder Patients showing Improved Mortality

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**Background:** Substance Use Disorder (SUD) is a chronic disease associated with significant adverse social, medical, economic, and psychiatric impacts. The costs of abuse and addiction include increased mortality and morbidity (Bailey, Campagna & Dart 2009; Rehm et al. 2009) and increased health care expenditures (Clark, Samnaliev & McGovern 2009; Rehm et al. 2009). Given the slow rates of adoption of new practices increasing rates of abuse and the gap between the number of people who need treatment and those receiving treatment, the field of addiction treatment must continue to evolve to ensure access to efficacious, cost-effective services that promote long-term recovery. One such intervention is medication-assisted treatment (MAT). There is also growing emphasis on the incorporation of recovery-coaches in different treatment settings of SUDs. Recovery coaches (RCs) work in range of settings, including recovery community centers where educational, advocacy, and sober social activities organized in churches, faith based institutions, recovery homes/sober housing, jails and prisons, probation and parole programs, drug courts, HIV/AIDS and other health and social centers, and addiction and mental health treatment agencies. Our primary team at UMass Memorial Medical center consists of Addiction Psychiatrists, Addiction Social Workers (SWs) and RCs. The aim of our service is to implement evidence-based approaches in all facets of a SUD patient. We provide access to a range of resources bedside in person and/or via Tele-video consultations with addiction specialists in Psychiatry, SW and RC. Post-discharge coaching measures are discussed with RCs and tailored to meet the patient needs to achieve and maintain sobriety.

**Methods:** Recent Population Statistics (September 2018) released by Massachusetts Department of Public Health (MA DPH) demonstrated in fiscal year 2017, there have been 12,104 admissions related to substance use in Worcester County alone, with 58.7% reporting heroin as their primary substance, 27.2% reported alcohol as their primary substance. In May 2019, MA DPH also reported statewide decrease in opioid-related overdose deaths in 2018 compared to 2017, however in Worcester county, the number opioid related overdose deaths increased from 264 (2017) to 283 in 2018. UMass Memorial Medical Center is a tertiary care hospital with 773 beds and an approximate of 37000 hospital admissions every year. As per our internal database, our Addiction Psychiatry team received 1400 consults from January 2017 to September 2018. Data was collected prospectively as we provided our services to patients seen by the team and retrospectively chart reviews were done electronically over a 60 days period. Prospective data included tracking demographics, past medical/substance use history, pain scales, recovery coach interventions, social work interventions, MAT/Addiction psychiatry consult details, discharge planning and admission details. Retrospective chart reviews done by research coordinators gathered data points regarding ED/Inpatient healthcare utilization status, post discharge community interventions, and deceased status.

**Results:** On data analysis, sadly we noticed 35 deaths, 5 (14%) of these patients declined to receive any of our services. A further breakdown of the deceased patient and the combination of services they received in hospital, we noticed 15 (42%) of the deceased patients had received recovery coach interventions alone and declined to meet with SW/addiction psychiatrist for MAT. 5 (14%) patients had received a combination of RC and SW interventions but declined MAT; 5 (14 %) patients received SW and MAT but received no follow up with RC. 3 (8%) patients received MAT alone. However, data showed zero deaths among patients who made full advantage of the service, which is a combination of MAT from addiction psychiatrist, Social work and recovery coach follow up. Limitations: As mentioned substance use disorder is a chronic disease where a range of factors affect mortality and morbidity. When the location of disposition reviewed among these patients, it was noted that 9 patients were discharged home, 12 patients discharged to skilled nursing facility/rehab/long term care, 13 patients discharged to substance use facility and 1 patient disposed to psychiatric inpatient facility. Data on deceased status was tracked until 60 days post-discharge; our grant ended September 2018, we anticipate doing a 12-month review on the deceased status in September 2019, results with more details on demographics and clinical characteristics will be updated in the final Poster.

**Conclusions:** Results from the data analysis shows improved mortality in SUD patients who received the full range of resources provided by Recovery coach, Social work and Addiction Psychiatrist. Although this single site study supports improved mortality with different treatment strategies, these findings are only correlation data, we are unable to infer direct causation. More clinical research trials are required to prove direct causation, minimize confounding factors and requires replication in other centers before widespread adoption.

**Summary:** As we know, addiction is a complex disease with many co-occurring morbidities and no single treatment is appropriate for everyone. It's important to understand effective treatment attend must address to multiple needs of the individual and not just the substance use. With our ongoing Clinical Service, we continue to try to beat addiction with a multi-faceted approach and help patients achieve long term recovery. We recently expanded our services to Emergency Department to provide early access to treatment by initiating MAT in ED and connecting these patients with Recovery coaching and Bridging services. We are hoping these initiatives will enrich our program and the hospital with more tools to help treat SUD patients and help improve mortality and morbidity rates in not only in hospital but also in the community. Acknowledgements: We would like to acknowledge the continued relentless efforts of our Recovery coaches (Richard Kenny, Rob Ryan, Teresa Phelan, Amy Nichols) and Social Workers (Peter Zawrotniak LICSW and John Monfredo MSW) for their work in the field of Addiction.

**Funding Sources:** Massachusetts Health Policy Commission

## Poster 44: Our Understanding of the Cannabis Curriculum: A Systematic Review of Literature Regarding Cannabis Education in Medical and Residency Programs

**Ashvin Sood, MD**, *New York University*; **Sierra Ferguson, MD**, *Mount Sinai*; **Timothy Rice, MD**, *Mount Sinai*

**Background:** Cannabis use has grown steadily in the past decade, with over 25 million US citizens reporting use in the past month, and over 39 million US citizens reporting use in the past year. Factors that have promoted increased use include legalization of cannabis, perceived safety of cannabis, and greater social acceptance. Despite the steady increase in cannabis use, few medical practitioners feel comfortable discussing, prescribing cannabis, or treating cannabis use disorder. Additionally, trainees in both undergraduate and graduate medical education report feeling unprepared to provide psycho-education about cannabis to patients. Currently, there is no requirement for residency training programs to include cannabis education in the curriculum, and only 9% of US medical schools have documented cannabis related curriculum. Our project was aimed to conduct a systematic review of literature pertaining to curricula involved with cannabis in the undergraduate, graduate, and post-graduate level.

**Methods:** A systematic search of MEDLINE database using the key words cannabis, marijuana, education, and curriculum was conducted. Inclusion criteria involved peer reviewed articles, review articles, and qualitative and quantitative analysis. Exclusion criteria included non-related topics, editorials, and non-peer reviewed sources. Accreditation Council for Graduate Medical Education (ACGME) and American Association of Directors of Psychiatry Residency program (AADPRT) resources were also examined for cannabis education materials. Data was analyzed by two authors separately, and a third author compared these results to those obtained through an independently conducted review utilizing the evidence-based Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedure.

**Results:** 195 articles were identified in the initial review. 29 articles met inclusion and exclusion criteria. Only 1 article included content to cannabis curriculum in medical education. 2 papers called for improved education of cannabis education into the curriculum in pharmacy schools, 1 paper argued for the need for improved training for employees who work at medical marijuana dispensaries, and 11 of the articles involved studies related to improving patient education on cannabis. Data from the ACGME revealed that only 1 month of addiction training is required out of a 48 month psychiatric residency, without specific content related to cannabis education. The AADPRT did not have a model curricula related to cannabis. The PRISMA review identified several additional articles and finalized the review through an evidence-based methodological procedure.

**Conclusions:** A well-developed education curriculum regarding cannabis is lacking for psychiatric residents during their training. Furthermore, addiction psychiatry training is significantly limited during general adult psychiatric residency. Our literature review demonstrates there is a need for the development and implementation of formal curriculum to teach psychiatric residents about cannabis, including topics related to medical and recreational cannabis as well as diagnosis and treatment of

cannabis use disorder. The created PRISMA flow diagram demonstrates the benefits of using evidence-based methodology for systematic reviews in emerging areas within the field of addiction psychiatry and medicine. Developing a curriculum pertaining to cannabis will allow psychiatric residents to have a strong foundation in understanding the pharmacologic properties cannabis, develop confidence in providing psycho-education to patients, and promote interest in pursuing a career in addiction psychiatry.

**Summary:** Cannabis use continues to rise yet many clinical providers do not feel comfortable discussing cannabis with their patients. We conducted an evidence-based systematic review of literature that examined Cannabis education provided to medical trainees. Results indicate that there is limited data regarding cannabis curriculum and that both ACGME and the AADPRT do not have model curricula related to cannabis. Our research implies that further educational initiatives need to be pursued and implemented in both medical and residency training. Creation of a cannabis curriculum will provide trainees with an opportunity to learn about cannabis and translate their didactics into important psychoeducation for their patients.

**Funding Sources:** None

## Poster 45: Alcohol Use and Cigarette Smoking among Mental Health Professionals in China: A Cross-Sectional Survey

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**Background:** Smoking is very prevalent among healthcare professionals in China, with nearly 60% of male Chinese doctors being smokers. On the other hand, alcohol use in recent decades has increased in China. However, limited data are available on alcohol and tobacco use among mental health professionals. This cross-sectional survey was designed to collect such data and their sociodemographic correlates.

**Methods:** This survey was a part of a large-scale, nation-wide online survey of healthcare professionals. Socio-demographic data, along with data on alcohol and cigarette smoking were collected anonymously. The Chinese version of the Alcohol Use Disorder Identification Test (AUDIT-C) was used.

**Results:** In total, 16,256 mental health professionals from 41 major psychiatric hospitals in China completed the survey. Respondents were predominantly female (74.3%). 4576 were doctors, 9825 were nurses, 912 were pharmacists, 265 were clinical psychologists and 678 other professionals. 9.0% of participants reported as current smokers and 3.4% reported as past smokers. 32% of male professionals were current smokers. The rates of cigarette smoking were 12% in doctors (27.1% in males), 7% in nurses (36.7% in males), 5% among clinical psychologists (36.4% in males) and 11% among pharmacists (29.3% in males). 10.4% of participants (29.5% in males vs 3.8% in female) reported drinking alcohol at least twice a month, 2.8% (9.2% in males vs 0.6% in females) reported consumption of alcohol twice a week or more. Using the cut-off of 4 and 2, 19.5% of males and 11.6% of females were positive on AUDIT-C respectively. The rates of screen positive were 15.2% for physicians, 13.0% for nurses and 11.3% for psychologists.

**Conclusions:** Interventions are clearly needed to reduce alcohol and cigarette use and promote their health.

**Summary:** Alcohol and cigarette use are common among mental health professionals. Awareness and interventions are needed to address the issue

**Funding Sources:** None

## Poster 46: Pattern of Substance Use in Patients with Schizophrenia Spectrum Disorders at a Community Teaching Hospital

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**Background:** Schizophrenia spectrum disorders are a group of severe mental illnesses associated with an increased risk for substance use disorders. Dual diagnosis of schizophrenia and substance use disorder (DuDSS) poses a therapeutic challenge and is associated with poorer clinical outcomes. A 2017 national survey found that 8.5 million American aged 18 or older had any mental illness and substance use disorder while 3 million (1.3%) American adults had co-occurring severe mental illness and substance use disorder. Other studies report a lifetime prevalence of DuDSS that ranges between 10% and 70%. The prevalence of substance use and schizophrenia are reportedly higher in inner cities compared to suburban areas. For instance, a review of the scientific literature shows the prevalence of DuDSS ranged from 16% to 30% in inner cities versus 7% to 18% in mixed areas. These have been attributed to the preponderance of social risk factors in urban cities. Unfortunately, many Americans with a substance use disorder often go undiagnosed and as high as 90% of those who need treatment do not receive care. New York City is one of the largest cities in the world and has a high burden of “mentally ill chemically-affected” individuals. Given that schizophrenia spectrum disorders account for over 50% of psychiatric hospitalizations in the City, psychiatric inpatient settings provide an opportunity to detect and provide integrated care for those with DuDSS. The objective of this study is to determine the pattern of substance use among patients admitted for schizophrenia spectrum disorders in an in-patient setting.

**Methods:** A retrospective review of 365 consecutive charts of patients discharged from the psychiatric units of the hospital from July 1, 2017, through September 30, 2017, was conducted. Extracted data were analyzed using SPSS version 20. Frequencies and proportions for demographic and disease-related characteristics were calculated. Pertinent continuous variables were recoded into categorical variables. Chi-square-tests or Fisher’s exact tests were performed for categorical variables. Multivariable logistic regression analysis was performed to assess predictors of co-occurring substance use disorder. The one-sample Kolmogorov–Smirnov test was used to check the normality of distribution of continuous variables. Missing data excluded from analysis. Statistical significance was defined as  $p \leq 0.05$ .

**Results:** Approximately 78% of the total patients were Black (283), males (249; 68%), unemployed (354; 97%), single (348; 95%), and homeless (186; 51%). Their ages ranged from 19 to 79 years (mean = 42 years) and the length of hospital stay ranged from 1 – 129 days (median = 11 days). Of the 365 patients, 268 (77%) had a DuDSS. Of these, 199 (67%) were males and 217 (81%) identified as Black. The most co-occurring substance use included tobacco (213; 62%), cannabis (134; 42%) alcohol (138; 40%), and cocaine (89; 27%). Race and sex were observed to be significantly associated with DuDSS ( $p=0.08$  and  $p=0.01$  respectively).



**Conclusions:** The prevalence of dual diagnosis of substance use disorder and schizophrenia spectrum disorder was high in our study population. Additionally, race and sex were found to correlate with having a dual diagnosis. The results from this study underscore the high burden of co-occurring substance use among patients with severe mental illness in a major city and the need to educate clinicians and target therapeutic interventions, research, and policies to lessen its negative impact.

**Summary:** Dual diagnosis of substance use disorder and mental illness is a major public health impact. Despite this, there is a dearth of psychiatrists and researchers with expertise to manage the growing burden of co-occurring psychiatric and substance use psychiatric disorders. Through this study, we aim to increase the knowledge and awareness of psychiatrists, researchers, and policymakers regarding the epidemiology of substance use among psychiatric inpatients.

**Funding Sources:** None

## Poster 47: Phenobarbital versus Lorazepam for Alcohol Withdrawal Syndrome: A Retrospective Cohort Study

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**Background:** Alcohol is the most widely available abused substance in the United States. An estimated 1.2 million hospital admissions are related to alcohol use annually, and about 500,000 episodes of withdrawal symptoms are severe enough to require clinical attention annually. Sedative-hypnotic agents are recommended as primary agents for management of alcohol withdrawal. However, current evidence does not clearly indicate that a specific agent is superior to others. Only a few double blinded randomized controlled clinical trials done in the emergency department settings have studied treatment of Alcohol Withdrawal Syndrome (AWS). The primary objective of this study is to compare the use of phenobarbital versus lorazepam in management of hospitalized patients with AWS in regards to hospital Length of Stay (LOS).

**Methods:** This is a retrospective cohort study over a two-year period (March/2016- March/2018) from three hospitals within St. Joseph Mercy Health System. Records of 1007 patients, 18 years of age and older, admitted with a primary diagnosis of alcohol withdrawal, and treated by protocol with phenobarbital or lorazepam were reviewed. Patients were excluded from the study if they were directly admitted to the ICU, seen by an Addiction Medicine consultant or transferred to another institution. Six-hundred and six patients met the inclusion criteria (543 in the lorazepam cohort and 63 in the phenobarbital cohort). Adjusted comparisons were done using propensity scoring methods. Hospital LOS was set as the primary outcome. Secondary outcomes included all-cause 30-day readmission rate, alcohol-related 30-day readmission rate, 30-day Emergency Department (ED) visits, and need for Intensive Care Unit (ICU) transfer.

**Results:** Patients who received phenobarbital had a statistically significant shorter hospital LOS as compared to patients who received lorazepam (2.8 versus 3.6 days, P-value < 0.001). Furthermore, the phenobarbital treatment group had statistically significant lower rates of all-cause 30-day readmission (11.11% versus 14.18%, P-value = 0.039) and 30-day ED visits (11.11% versus 18.6%, P-value = 0.014). No statistical significance was detected for alcohol-related 30-day readmission rate and need for ICU transfers between the treatment groups.

**Conclusions:** This pilot retrospective cohort study suggests that phenobarbital might be a reasonable alternative to lorazepam in the management of alcohol withdrawal syndrome patients in regards to hospital length of stay, all-cause 30-day readmission rate, and 30-day ED visits. The study has several limitations, including its retrospective nature, as well as the inherited bias when comparing different hospitals. However, all three facilities are under the same administration in terms of physicians, nurses and pharmaceutical protocols, which would reduce the weight of bias but would not eliminate it.

**Summary:** Alcohol withdrawal syndrome is a serious and costly medical condition. The results of our study showed that patients who received phenobarbital had a statistically significant shorter hospital LOS as compared to patients who received lorazepam (2.8 versus 3.6 days, P-value < 0.001). Our results suggest that in acute-care hospital settings, treating alcohol withdrawal with phenobarbital may result in a shorter length of stay, relative to lorazepam. Larger scale studies, powered to prove non-inferiority of phenobarbital to lorazepam are required to corroborate these findings.

**Funding Sources:** None

## Poster 48: Physiological Sequelae of Electronic Cigarettes: A Systematic Review

**Ibrahim Sablaban, DO**, *Henry Ford Hospital/Wayne State University*

**Background:** While recent data indicate significant declines in combustible tobacco product use, particularly among young people, these reductions have been offset by substantial increases in non-combustible products, most notably electronic nicotine delivery devices (ENDS, or electronic cigarettes). Indeed, e-cigarette use surpassed combustible cigarette use among youth and young adults for the first time in 2014 national data, a trend that has continued to the present, making e-cigarettes prevalence rates lag only behind marijuana and alcohol. A cumulative body of work is beginning to show strong evidence that e-cigarettes are appealing to a younger audience, a sizable portion of whom were never combustible cigarette users. Although e-cigarettes were initially marketed circumventing claims of outright carcinogenicity and harmfulness, and even promoted as effective tools for combustible cigarette cessation, little data exist on the physical effects of e-cigarette use. While combustible cigarettes have been implicated in a multitude of health problems spanning the entire human body, and linked to various cancers, it is paramount that we understand how e-cigarette use may have similar negative effects. Doing so will give clinicians a more robust knowledge base with which to advise and treat their patients.

**Methods:** To help guide our efforts in this area, we conducted a review of publications on MEDLINE through December 31, 2018 in addition to other targeted searches, centered around the health effects of e-cigarette smoking. We included the terms non-combustible cigarettes, electronic cigarettes, e-cigarettes, nc-cigarettes, and vaporized cigarettes coupled with health effects, physical health, and physiological effects. Search terms were broadened to include neuropsychiatric and psychiatric sequelae with the intent of assessing psychological and physical overlap. The final search yielded 118 results. Forty-seven of these manuscripts were excluded due to their research methodology (e.g., solely prevalence rates), repetition, and poor applicability towards our review topic (e.g., association of use with other illicit substances). Of the remaining manuscripts (n = 71), results demonstrated a wide range of deleterious effects across multiple organ systems.

**Results:** Although the review indicated that particular carcinogens (tobacco specific nitrosamines) were present in lower amounts when compared to combustible cigarettes, significant and potentially harmful levels remained in e-cigarettes. In addition, data showed that users may also be putting themselves at risk of deleterious effects at a cellular level from volatile organic compounds or carbonyl compounds not previously appreciated with c-cigarette use. Derangements in heart rate variability, atherosclerotic disease processes, potentiation of bronchitis and obstructive pulmonary processes were the most clearly demonstrated in the data. Suicide and hazardous ingestion are also apparent as a steadily growing concerns, with 9 of our 71 sources demonstrating the use of liquid nicotine delivery mediums in both lethal ingestion and suicide in the United States and abroad.

**Conclusions:** Given the lack of randomized double-blind placebo controlled studies, the majority of the content reviewed involved small sample sizes, case studies, and in vitro research. Generalizability is also limited by the sparsity of data about the direct effects of ENDS on organ systems. ENDS are also non-uniform by design, with a variation of flavor content and delivery mediums, further complicating consistent study. While substances that are classically associated with carcinogenicity in combustible cigarettes are present in lower amounts in ENDS, they are not absent, presenting new concerns. The ENDS solutions themselves are also increasingly implicated as agents of toxic ingestion and suicide, both internationally and in the United States, creating a trend of easier access to potentially lethal means. Given that ENDS regulation is still in its infancy and data suggests continued increases in prevalence among combustible cigarette naive youth, assessing long-term physical effects is of utmost importance. Health care providers are increasingly having conversations with patients about ENDS, though the extent to which physicians and others are knowledgeable about the relative harms and benefits associated with e-cigarette use appears to be low. Thus, more work needs to be done to understand the physical health effects of a burgeoning risky behavior.

**Summary:** We lack robust conclusive data-sets about the detrimental effects of ENDS, but mounting evidence we present suggests that they are not benign and may pose a significant threat to the long term health of the tobacco naive populations rapidly adopting their use. In the same breath, we currently do not have the means to regulate and monitor the long term effects of ENDS due to the non uniformity of the products being sold and their ease of access. It is evident that many in healthcare are not comfortable in their knowledge base with ENDS and may as a result, have a difficult time managing patients who use these products. Educating patients, youth and healthcare providers about the potential detriment these products carry is of utmost importance to mitigate potential harm, until further more conclusive research can be done. Lobbying government with more involvement from psychiatrists and healthcare providers is necessary for more informed-regulation of the sale and distribution of these products.

**Funding Sources:** None

## Poster 49: Prevention and Treatment of Substance Abuse in Medically Ill Adolescents with Disrupted Development using the Integrated Care Model

**JD Henneberry, MD**, *Zucker School of Medicine; Staten Island University Hospital*; **Peng Pang, MD**, *Zucker School of Medicine; Staten Island University Hospital*

**Background:** Adolescent survivors of ALL are at high risk for psychosocial distress secondary to illness related effects on self-concept, self-esteem, bodily experience, threat of death, social development, social isolation, family, and education. ALL survivors acutely experience increased emotional distress during and after their treatment with elevated anxiety and depression scores three-months off therapy (Kunin-Batson 2016). These patients are also at high risk for persistent decline in cognitive, emotional and behavioral, and academic function, with parent surveys showing higher rates of anxiety-depression, headstrong behavior, inattention-hyperactivity, and social withdrawal, compared with siblings, 5-20 years following hematology treatment (Jacola 2016). Several systemic reviews and metanalysis showed improvement with psychological intervention, for emotional distress in pediatric oncology patients, however, data is mostly short-term (Coughtrey 2018, Peikert 2018, Pai 2006). There is limited research examining long-term efficacy of psychosocial intervention in preventing psycho-social developmental deficits, mental health issues, and substance abuse and the associated negative impacts on this population. Several organizations, such as NCCN and SIOP, have guidelines for screening and intervention of psychosocial distress, yet, approximately only 9.3 % of childhood oncological institutions have a standardized approach to psychosocial assessments (Kazac 2012). We aim to show how unmet psychosocial developmental needs in chronic medically ill adolescents may create and amplify psychosocial distress, encourage substance use, and have disastrous (but preventable) consequences. We will also provide recommendations for screening, prevention, and treatment.

**Methods:** This is a case report. This patient was followed by our psychiatry team in several settings including initial evaluation in the emergency room, inpatient psychiatric hospitalization setting, and outpatient clinic. Additionally, throughout the care of this patient, we collaborated with teams such as neurology inpatient consult service, neurology outpatient service, pediatric inpatient service, and pediatric oncology outpatient service. Neurocognitive testing was performed by a licensed neuropsychologist in both inpatient and outpatient settings. PET results were analyzed using Cortex ID by a licensed nuclear medicine radiologist. Written consent for this presentation was obtained from the patient, who also signed a HIPPA release form.

**Results:** CSF results showed a nonspecific neuroinflammatory process as evidenced by elevated CSF IgG, albumin. Notably, anti-NMDA Ab were absent as were oligoclonal bands. Serum results also showed a nonspecific inflammatory process with elevated ESR (20) and CRP (.45) as well as positive anticardiolipin Ab and anti-TPO antibody (thyroid panel was within normal range). 24-hour video EEG was normal. CT and MRI (without contrast) were normal. FDG PET Scan showed hypermetabolism in basal ganglia and anterior cingulate cortex - additionally, abnormally increased frontotemporal occipital gradient was noted; all of which is consistent with encephalitis. Initial neuropsychological testing showed impairments in attention, processing speed, visuospatial ability, and executive function. It was noted

that although sustained attention was preserved, verbal learning, verbal memory, working memory, and planning were significantly impaired. Follow up data will be available for presentation. Note: We will include graphical results of longitudinal neurocognitive improvement, starting with a zero point of catatonia for all domains and provide comparative data to both patients with cannabis use as well as chemotherapy history.

**Conclusions:** Substance use and associated negative impact among medically ill adolescents are preventable. Psychosocial and developmental needs of children and adolescents must be accounted for when providing medical care. An integrative care model can be effective in providing this care and preventing substance use in this population. Unfortunately, very little is being done in this population to address the factors causing difficulties in social reintegration and neurocognitive-behavioral decline. Our case shows how our current health care system is failing to provide comprehensive care despite literature supporting its importance. We hope that all will take this case as a humbling reminder of the importance of integrating developmentally based psycho-social treatment into adolescent medical care.

**Summary:** We present the case a 17-year-old female with acute on chronic neurocognitive-behavioral decline manifested by sudden onset of catatonia, withdrawal, avolition, and severe functional impairment with an extended waxing and waning course of recovery. She has a history of ALL (acute lymphoblastic leukemia) with one recurrence, treated extensively with intrathecal and intravenous methotrexate, with one episode of clinically diagnosed methotrexate leukoencephalopathy. Prior to presentation she has been using marijuana oil via a vape pen extensively (at least twice daily for 6 months) to manage her daily anxiety, likely precipitating acute neurocognitive dysfunction in a background of methotrexate induced neurocognitive late effects. We place our findings in emerging literature of neurocognitive late effects of methotrexate in ALL survivors and effects of mental health issues and cannabis use on the adolescent developing mind. Considering the vulnerability of at-risk children and adolescents with chronic medical conditions, we bring to light the profound need for psychoeducation, prevention, psychosocial assessment, and early interventions for ALL patients and their families. This need can only be effective using an integrated care model in mental health professionals, oncologists, pediatricians, families, and schools work in tandem, being mindful of the developmental needs of these patients. Finally, we make recommendations as to how similar patients may be treated with both pharmacologic and nonpharmacological (educational, behavioral, social) approaches.

**Funding Sources:** None

## Poster 50: Problematic Use of a Smartphone Game Leading to Excessive Spending

**Robert Andrew Kleinman, MD, *Stanford University*; Smita Das, MD *Stanford University***

**Background:** Smartphone access is widespread with seventy-seven percent of Americans owning such devices in 2016. With a widely available and accessible platform, vulnerable individuals may have easy access to potentially addictive applications that provide opportunities for in-app purchases. Despite media reports of individuals with high spending on in-game purchases, there do not appear to be previous reports in the scientific literature of problematic game use resulting in excessive in-game spending. This report describes a patient with a rapid escalation in-game purchases within Candy Crush Saga, a “free-to-play” smartphone-based game, to nearly 40% of his monthly income.

**Methods:** Case report.

**Results:** A United States Veteran with post-traumatic stress disorder, major depressive disorder, in remission, and opiate use disorder treated with buprenorphine/naloxone started making in-app purchases within Candy Crush Saga, a game he had been playing for five years. Within six months, his purchases escalated to approximately 40% of his monthly income, and he met DSM-V criteria for internet gaming disorder. Treatment involved motivational interviewing, family therapy, and the patient rescinding access to potential forms of electronic payment.

**Conclusions:** Free-to-play games with in-game purchases have the potential to create significant financial consequences in patients with gaming disorder. Given the widespread availability of these games, further research is needed to understand the effects of these games on vulnerable patient populations.

**Summary:** We report the case of a patient a rapid escalation in-game purchases within Candy Crush Saga to nearly 40% of his monthly income. The case highlights how free-to-play games with in-game purchases have the potential to create significant financial consequences in patients with gaming disorder. Given the widespread availability of these games, further research is needed to understand the effects of these games on vulnerable patient populations.

**Funding Sources:** None



## Poster 51: IV Diphenhydramine Addiction: A Case Series and Review of the Literature

**Lala Park, MD**, *University of Chicago Medical Center*; **Katie Washington Cole, MD, PhD**, *University of Chicago Medical Center*; **Amber Bard, MD**, *University of Chicago Medical Center*; **Holly Shiao, MD**, *University of Chicago Medical Center*

**Background:** Intravenous (IV) diphenhydramine is a medication with antihistaminergic, antimuscarinic, and anticholinergic properties, with FDA-approved indications for allergic reactions to blood/plasma products, adjunctive treatment for anaphylaxis, anti-parkinsonism treatment for patients unable to take PO, and motion sickness. Although there are some descriptions of misuse of diphenhydramine and other antihistaminergic medications in the literature, several cases seen by our consultation-liaison (CL) psychiatry service demonstrate the complexity of IV diphenhydramine misuse among patients with severe chronic medical illnesses.

**Methods:** We conducted a qualitative review of published reports on diphenhydramine misuse. We also documented three patient cases of IV diphenhydramine use, with concern for substance use disorders, seen by our CL psychiatry service in a large, urban academic medical center.

**Results:** Existing literature suggests that misuse of diphenhydramine is associated with patients with schizophrenia and antipsychotic use. However, the three cases identified by our CL psychiatry service were not associated with psychotic illness. The patients we saw had severe, chronic medical illnesses requiring frequent hospitalizations. In each case, the patients specifically requested IV diphenhydramine, instead of oral, to alleviate insomnia, itching or to prevent adverse reactions to blood/plasma products. For patients who had multiple previous admissions, providers varied greatly in their willingness to order IV diphenhydramine. In our three cases, the patients' use of IV diphenhydramine was not the primary consulting question for the CL psychiatry service; instead we were asked to evaluate the patients for comorbid mood, anxiety and/or somatoform disorders alongside existing medical reasons for admission. The patients often had conflicting relationships with members of the primary team, and we used the liaison part of our role as CL psychiatrists. In some cases, excessive use of IV diphenhydramine continued despite side effects that mimicked or worsened the symptoms of their chronic medical illness.

**Conclusions:** The cases presented in this study suggest that some chronic medically ill patients with frequent hospitalizations are at risk for IV diphenhydramine misuse. Variability in physician prescribing behaviors among patients with complex medical and psychiatric comorbidities and challenging patient-provider interactions may increase the risk of IV diphenhydramine misuse. Psychiatrists may not always be asked to participate in the care of these patients. However, when we are involved, detailed medication histories and patient/colleague education may help to prevent further iatrogenic harm to patients.

**Summary:** We conducted a review of published reports on diphenhydramine misuse and documented three patient cases of IV diphenhydramine use, with concern for substance use disorders, seen by our CL

psychiatry service in a large, urban academic medical center. Existing literature suggests that misuse of diphenhydramine is associated with patients with psychotic illnesses. However, the three cases identified by our CL psychiatry service were not associated with psychotic illness. The patients we saw had severe, chronic medical illnesses requiring frequent hospitalizations. Our cases suggest that some chronic medically ill patients with frequent hospitalizations are at risk for IV diphenhydramine misuse. Variability in physician prescribing behaviors and challenging patient-provider interactions may increase the risk of IV diphenhydramine misuse. Psychiatrists may not always be asked to participate in the care of these patients or sometimes may be consulted for reasons other than the underlying IV diphenhydramine misuse. When consulted on the at-risk patients, we can help to prevent further iatrogenic harm to patients by taking detailed medication histories, playing a liaison part of our role as CL psychiatrists, and educating our patients as well as our non-psychiatrist colleagues.

**Funding Sources:** None

## Poster 52: Psychosis Induced by High Potency Cannabis: A Case Report

**Raheel Chaudhry, MD**

**Background:** We present a unique teaching case that can provide a broad differential diagnosis and highlight the role that high potency cannabis can play in psychiatric diagnosis and treatment. There has been approximately 60 % increase in the potency of cannabis in the last 3 to 4 decades. The primary psychoactive agent in Cannabis is delta-9-tetrahydrocannabinol (THC) and it has been approximated that the THC content of street marijuana was <1% in the 1970's compared to the current high potency cannabis that can contain in between 35-90% of THC so therefore there has been an increasing concerns related to its risks including cannabis induced psychosis and its association with early onset psychosis or schizophrenia. Cannabis of high potency can be associated with increased risk of psychosis and early onset psychosis or schizophrenia.

**Methods:** We present a case of psychosis induced by high potency cannabis and discuss its psychiatric diagnosis & management in clinical practice. Case Report: A 20-year-old male patient with no past psychiatric history who was admitted to the inpatient psychiatric unit for new onset psychosis. Patient has no family history of schizophrenia and he presented with paranoia, hallucination which was new in onset and precipitated by high potency cannabis use. So we performed a literature review of common databases including: Cochrane, PubMed, Embase, Clinical Key, Medline, Web of Science. Search Terms: Cannabis-induced psychosis, High potency cannabis induced psychosis, Cannabis and psychosis, Role of cannabis and schizophrenia, Cannabis and early onset psychosis. Cannabis induced Schizophrenia and Cannabis & co-morbid psychiatric disorders.

**Results:** The literature review strongly supports a correlation between high potency cannabis use leading to psychosis. There is also a strong positive correlation between high potency cannabis leading to or exacerbating early onset psychosis / schizophrenia. The literature review found that approximately 40% of patient who were initially diagnosed with cannabis induced psychosis developed a primary psychotic disorder at one-year follow up.

**Conclusions:** The recreational use of high potency marijuana is increasingly observed in young individuals who presents with early onset psychosis. Through this case discussion and review of current literature, we present information on the importance of timely and specific toxicology screenings, and some of the treatment challenges. Post-discharge follow-up of these patient would include psychoeducation to identify the relationship between high potency cannabis use and psychotic symptoms.

**Summary:** So we alert clinicians to be aware of psychosis induced by high potency cannabis and provide psychoeducation and cannabis use counseling to the patients. Additionally, it will be vital for psychiatrist to further screen for high potency marijuana use in order to assess for potential psychiatric risks.

**Funding Sources:** None

## Poster 53: Rates of Fentanyl Use Among Psychiatric Emergency Room Patients at VA Connecticut Healthcare System

**Stephan Jaeger, MD, *Yale University*; Brian Fuehrlein, MD, PhD, *Yale University*; Gabriela Garcia Vassallo, MD, *Yale University***

**Background:** Opioid use disorder is rapidly growing and has quickly become one of the worst crises faced by The United States. Opioid overdose death rates continue to increase, with over 70,000 deaths occurring in 2017. The one-year span from 2016-2017 saw an increase of over 45% in deaths involving synthetic opioids, including fentanyl. Exposure to fentanyl significantly increases the chance of overdose death, and is primarily responsible for the increase in overdose deaths from 2011 through 2017 (Zoorob 2019). In addition, rapidly emerging Fentanyl analogues are increasing in number and strength and are contributing to overdose deaths. Fentanyl and fentanyl analogues pose a major public health risk. The psychiatric emergency room (PER) at VA Connecticut provides care to veterans with any psychiatric or substance-related emergency. Common presentations include alcohol use, opioid use, cocaine use, suicidal or homicidal ideation, PTSD, psychosis and other crises. Patients typically remain in the PER for an overnight observation and disposition determination following completion of a history and physical examination, routine blood work and collateral information from family and providers. The primary specific aim of this study is to determine the rates of fentanyl in the urine drug screens of all patients who present to the PER at VA Connecticut over a 7-month period. Secondary aims include determining how the presence of fentanyl is related to the presence of other drugs of abuse and to psychiatric diagnosis.

**Methods:** Data were collected for all patient presentations between June 2018 through December 2018. There were 746 total presentations with 497 being unique. Collected data included basic demographic information, psychiatric diagnosis, presence on high risk for suicide list, presenting complaint, disposition plan and urine drug screen for the presence of opioids, cocaine, cannabis, benzodiazepines, methadone, amphetamines and fentanyl. Positive fentanyl urine drug screens were sent for confirmation analysis.

**Results:** Of the 746 presentations, 693 were male and 53 were female. The average age of presentation was 52.4 with a range of 19-98. Rates of various diagnoses includes (note that many had multiple diagnoses hence the total number exceeds the total presentations): Alcohol use disorder: 443 (59.4%), Opioid use disorder: 173 (23.2%), Cocaine use disorder: 217 (29.1%), depressive disorder: 236 (31.6%), bipolar disorder: 131 (17.6%), anxiety disorder other than PTSD: 73 (9.8%), PTSD: 276 (37.0%), psychotic disorder: 95 (12.7%) and cognitive disorder: 47 (6.3%). Of the 746 presentations, 568 urine drug screens (76.1%) and 461 fentanyl screens (61.8% overall, 81.2% of complete UDS) were completed. Of the 461 fentanyl screens, 66 (14.3%) were positive. The average age of those who tested positive for fentanyl was 45.1. the range was 27-80. Of those who tested positive for fentanyl 62 were male and 4 were female. The 66 positive tests were from 55 different veterans, with one veteran testing positive on 4 different presentations and 7 veterans testing positive two different presentations. Of those positive for fentanyl: 44 (66.7%) were also positive for opioids, 31 (47.0%) were also positive for cocaine, 14 (21.2%)

were also positive for cocaine, but negative for other opioids, 17 (25.8%) were positive for cocaine and opioids, 8 (12.1%) were negative for both opioids and cocaine. Of those with a positive fentanyl screen, 39 (59.0%) had a presenting complaint related to opioid use. Regarding psychiatric diagnoses, 24 (36.4%) had a diagnosis of depression, 9 (13.6%) had a diagnosis of bipolar disorder and 28 (42.4%) had a diagnosis of PTSD. Seventy-one of the 746 (9.5%) presentations were identified as being on the high risk for suicide list. Of those, 53 (74.6%) completed urine drug screens. Eleven of the 53 (20.8%) urine drug screens were positive for opioids, and 6 (54.5%) that tested positive for opioids also tested positive for fentanyl, 3 (27.2%) were negative for fentanyl and 2 (18.1%) were not tested for fentanyl. Overall, 44 of the 53 (83%) completed a fentanyl screen. Of these, 12 (27.2%) were positive for fentanyl. Of the positives, 6 were also positive for opioids, 6 (50%) were positive for cocaine. Of note, 5 of the 6 that were positive for cocaine and fentanyl were negative for other opioids.

**Conclusions:** Given the significant correlation between fentanyl use and overdose death it is noteworthy that over 14% of those tested screened positive for fentanyl. Veterans on the high risk for suicide list had higher rates of positive UDS for both opioids and fentanyl, perhaps indicating a higher risk of overdose death in this population. Of note, over 21% of those who screened positive for fentanyl and cocaine screened negative for another opioid, indicating that some of the veterans might not realize they are consuming this incredibly dangerous substance. PTSD and depression were the two highest co-morbid diagnoses for those who screened positive for fentanyl. Overall, it is clear that fentanyl is prevalent in this population, increasing the risk of death by overdose for those who are struggling with substance use disorders and various mental health conditions.

**Summary:** We set out to determine the rates of fentanyl in the urine drug screens of all patients who presented to the PER at VA Connecticut over a 7-month period. Of those tested over 14% screened positive for fentanyl. Only 59% of patients who screened positive for Fentanyl had a presenting complaint of opioid use, which would suggest, without routine screening we are missing a large percentage of patients using fentanyl. Thus, it is possible that we are missing a large number of patients at risk of death by overdose. Knowledge of opioid and fentanyl use will allow us to offer treatment options for opioid use disorder and to take preventive measures, such as providing home Naloxone kits. Although it will come at a cost, and future research should include a cost benefit analysis, it is possible that routine screening for opioids and fentanyl could be of great benefit to patients.

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**Funding Sources:** None

## Poster 54: Recreational Marijuana Legalization: Patient Perception, Knowledge and Use in a Mental Health Clinic

**Matthew Perdue, MD**, *University of Southern California*; **Barbara Van Noppen, PhD**, *University of Southern California*

**Background:** Initiation of marijuana use and frequency of use has increased in the US since 2002 with data showing a differential impact of passage of state medical marijuana laws (MMLs) on increases in use among adults with limited data on the impact of recreational marijuana laws (RMLs) given the relatively recent legislation. Results of national surveys have indicated a trend toward more positive views of marijuana and reduced perceived harmfulness of regular marijuana use across multiple demographics, which has been suggested as an important predictor of the trend in use. Surveys of physician-authorized medical marijuana patients have identified motives for receiving treatment with marijuana that have largely included desire to improve psychiatric symptoms and conditions. In addition, prescribing data from Medicaid and Medicare databases have shown declines in prescriptions of FDA-approved medications for depression, anxiety and psychosis in states subsequent to passage of MMLs despite current evidence indicating no definitive efficacy for and even potential exacerbation of symptoms. Previous studies have described perception of marijuana and motives for use in patients presenting to dispensaries or designated marijuana specialty clinics in states with MMLs though limited data exists for patients receiving formal psychiatric treatment despite the inherent risks of use in this population. The present study aimed to contribute to this understanding in a population receiving community outpatient mental health treatment in California, a state with medical and recreational marijuana legalization, to better guide discussion regarding marijuana use and psychiatric conditions as more states pass legislation.

**Methods:** A literature search was conducted of previous surveys pertinent to assessing marijuana use and current evidence-base for effects of marijuana use on psychiatric conditions. A 27-item survey was created based on these findings using a Likert scale where appropriate to assess the following areas: sociodemographic factors, marijuana use, self-perceived and actual knowledge of marijuana effects on mental health conditions, sources of information accessed to obtain knowledge and interest in discussing marijuana effects with their mental health provider. Participants were English- or Spanish-speaking patients age 21 and older who were actively receiving treatment in the Los Angeles County + University of Southern California (LAC+USC) Medical Center Adult Outpatient Psychiatric Clinic. Patients were approached by clinic staff to assess interest in participating in the study during an outpatient clinic visit while waiting for their appointment over the course of 2 months. The survey was a brief, approximately 10-minute, anonymous, self-completed instrument. Numerical responses were quantified and summarized using counts and percentages. To test for associations between the independent measures and marijuana use status,  $\chi^2$  analyses were performed setting a 2-tailed cutoff for statistical significance at  $P < 0.05$  using SPSS software. Missing data were excluded from individual variables and noted when this occurred. 2019 Posters

**Results:** A total of 63 patients agreed to participate in the study and complete the survey. Women comprised 52% of the sample (n=33) and 60% (n=38) of the sample was age 21 to 44 with 40% (n=25) age 45 years and older. There was no measure of how many eligible patients declined to participate so the overall response rate could not be determined. Almost half (49%, n=31) of all respondents correctly identified the current legal status of marijuana in California with 11% (n=7) indicating that they have previously had a prescription for medical marijuana. One-fourth (25%, n=16) reported using marijuana within the past 30 days with all of these patients indicating that marijuana was used with the intent to improve their mental health. For all respondents, 89% (n=56) viewed their current mental health treatment as either very effective or somewhat effective with no significant difference observed among recent users and non-recent users ( $P=0.427$ ). A total of 27 respondents (43%) agreed that they felt knowledgeable about the effects of marijuana on mental health conditions, which was independent of recent marijuana use status ( $P=0.527$ ). In regard to the effects of marijuana on specific psychiatric conditions and symptoms, 75% (n=46, missing=2) endorsed not knowing if marijuana is an approved treatment for depression, 59% (n=36, missing=2) agreed that marijuana may cause or worsen symptoms of psychosis, and more than half indicated they did not know whether marijuana is an addictive substance (52%, n=31, missing=2) or whether there is risk of withdrawal from regular marijuana use (56%, n=34, missing=2). Recent marijuana users were significantly more likely to agree that marijuana is not addictive ( $P<0.01$ ) and agree that marijuana may cause or worsen symptoms of psychosis ( $P<0.01$ ). No statistically significant differences were observed by marijuana use status on knowledge related to approval of marijuana as a treatment for depression ( $P=0.336$ ) or risk of withdrawal from regular use of marijuana ( $P=0.236$ ). Only 3% (n=2) of respondents indicated that they have previously received information on marijuana and mental health from a healthcare provider with the most frequently reported sources identified as internet search (33%, n=21) and family or friends (40%, n=25). A total of 36 patients (60%, missing 3) agreed that they would be interested in receiving additional information from their mental health provider.

**Conclusions:** In our study, 25% of patients reported using marijuana within the past 30 days, which is higher than the reported 9.5% of adults reporting marijuana use in the past 30 days in a study by the California Department of Public Health in 2016. All recent marijuana use was reported to be with the intent to improve mental health symptoms even though most respondents (89%) described their current treatment in the clinic as either somewhat or very effective. Self-perceived knowledge of marijuana and mental health broadly was not influenced by recent marijuana use with 43% viewing themselves as knowledgeable despite only 3% indicating they have previously received information from a healthcare provider. Responses regarding marijuana and specific psychiatric symptoms and disorders varied with more certainty regarding risk of psychosis compared with depression and addiction.

**Summary:** This study highlights the potential uninformed self-treatment of psychiatric symptoms with marijuana in patients receiving mental health treatment in a state with recent passage of recreational marijuana legislation. Given the increasing access to marijuana in the U.S. through legislative and policy changes, evidence-based information regarding the risks of use needs to be more clearly communicated in the health care setting, particularly in the mental health field given the known risks in certain

disorders. Additional research is needed to better quantify the risks and benefits and determine effective means of communicating this information to have well-informed discussions with patients.

**Funding Sources:** None



## Poster 55: Reducing "No Show" Rates through Implementation of a Stage-Based Model of Care

**Shiva Sharma, MD**, *University of New Mexico*; **Paul Romo, MD**, *University of New Mexico*; **Larissa Maley, PhD**, *University of New Mexico*

**Background:** University of New Mexico Hospital (UNMH) Addiction and Substance Abuse Programs (ASAP) continues to strive for integration of medical and non-medical treatment modalities to serve its patients. Resources for substance abuse treatment are scarce and threatened by services under-utilization especially high no-show rate. ASAP sought to reduce the no-show rate by implementing a trauma-informed care model.

**Methods:** A “pre-post” study design was undertaken with implementation of an adapted three-phase trauma recovery model with the ASAP clinic population. Patients were transitioned to “walk-in” services. No-show rates were compared between appointments completed “walk-in” settings against appointments completed through the previous scheduled system. Frequencies and percentages in a univariate analysis are reported.

**Results:** Average no-show rate for 2017 (22%) and 2018 (16%). Comparable implementation period implementation (23% in 2017 versus 12% in 2018), marks a 43% decrease in no-show rates since implementation. ASAP walk-in from 04/2018 to 10/2018 received 2153 visits with 4% average monthly increase.

**Conclusions:** Expanded time availability to access medical/nonmedical services for substance abuse treatment led to reduction in no-show rate. In turn, wait-time for new patients decreased, provider productivity increased, and clinic revenue increased leading to expansion of treatment staff.

**Summary:** Implementation of “walk-in” medical/nonmedical services led to no-show rate reduction, which led to a direct increase in treatment compliance and provider productivity. Patients receiving substance abuse treatment may encounter barriers to attending scheduled appointments. Flexible timings allow patients to maintain treatment compliance and facilitates treatment of new patients. Reduction in no-show rate cause increase in revenue which in turn can benefit the clinic.

**Funding Sources:** None

## Poster 56: Risk Factors of Suicide in Treatment-Seeking Adults with Opioid Use Disorder

**Mina Rizk, MD**, *Columbia University*; **Barbara Stanley, PhD**, *Columbia University*; **Martina Pavlicova, PhD**, *Columbia University*; **Tse-Hwei Choo, MA**, *Columbia University*; **Jennifer Scodes, MS**, *Columbia University*; **Aimee Campbell, PhD**, *Columbia University*; **Edward Nunes, MD**, *Columbia University*; **John Rotrosen, MD**, *New York University*

**Background:** Life expectancy in the U.S. has declined for three years in a row, fueled largely by a record number of suicides and opioid overdose deaths. Although substance use disorder in general is known to increase suicide risk, opioid use disorders (OUD) have a distinctly strong relationship with suicide as compared with other substances. Around a third of individuals with OUD report a lifetime suicide attempt. However, to date, research on suicide risk in OUD is largely at the population level. In the current study, we examined the risk factors associated with history of suicidal behavior (SB) in treatment-seeking individuals with OUD.

**Methods:** Participants (N=570; 29.6% female; 17.4% Hispanic) were recruited through a multicenter, open-label, randomized trial to compare the effectiveness of extended-release naltrexone versus buprenorphine-naloxone. Participants were 18 years or older, had Diagnostic and Statistical Manual of Mental Disorders-5 opioid use disorder, and had used non-prescribed opioids in the past 30 days. Exclusions included serious current suicidal or homicidal behavior or other serious psychiatric, substance use or medical disorders. Logistic regression models were conducted to compare baseline demographic and clinical characteristics between OUD patients with lifetime history of suicidal behavior (OUD+SB) with those without such history (OUD-SB). All models were adjusted for site as a random effect. All hypothesis tests were two-sided with a significance level of  $\alpha=0.001$  to correct for multiple comparisons.

**Results:** Ninety-four participants (16.5%) endorsed history of suicidal behavior. OUD patients with history of suicidal behavior demonstrated significant degree of comorbid psychiatric disorders and history of stressful life events. Specifically, they were significantly more likely to have comorbid major depressive (OUD+SB= 46.8%; OUD-SB= 28.4%), bipolar (OUD+SB= 25.5%; OUD-SB= 11.6%) and anxiety (OUD+SB= 63.8%; OUD-SB= 41.4%) disorders, history of physical (OUD+SB= 72.3%; OUD-SB= 34.3%) and sexual (OUD+SB= 54.8%; OUD-SB= 21.3%) abuse, compared with those without history of suicidal behavior (all  $p<0.001$ ). Demographic characteristics, duration and type of abused opioid, comorbid other substances abuse, and smoking status did not significantly differentiate the two groups.

**Conclusions:** Comorbid mood and anxiety disorders, and history of physical and sexual abuse may be significantly associated with suicidal behavior in opioid abusing individuals. These findings are consistent with prior studies on methadone-maintenance OUD patients.

**Summary:** Overall, suicide risk factors in OUD patients parallel those reported in general population. What is striking, however, is the extremely high sample prevalence of these risk factors among opioid users, which may have contributed to the high rate of lifetime suicidal behavior for participants in the current study. Clinicians should carefully assess suicidality in OUD patients who have comorbid mood

and anxiety disorders or histories of abuse. This may help in curbing the high suicide rate in this population.

**Funding Sources:** NIDA Clinical Trials Network UG1 DA013035 (PIs: Rotrosen, Nunes). Mina Rizk is supported by the Paul Janssen Postdoctoral Fellowship in Translational Neuroscience.

## Poster 57: Screening in Trauma for Opioid Misuse Prevention: The Role of Social Support

**Amelia Baltes, BS**, *University of Wisconsin School of Medicine and Public Health*; **Christopher Nicholas, PhD**, *University of Wisconsin School of Medicine and Public Health*; **Katherine Mijal, BS**, *University of Wisconsin School of Medicine and Public Health*; **Brienna Deyo, MPH**, *University of Wisconsin School of Medicine and Public Health*; **Randall Brown, MD, PhD**, *University of Wisconsin School of Medicine and Public Health*

**Background:** Opioid addiction and overdose are widespread in the United States. Social supports play a vital role in addiction development, prevention, and recovery, with potential contribution to the risk of initial misuse and ongoing use of substances and during the recovery process. Previous research suggests that the quality of an individual's interpersonal relationships influences their potential for success in treatment for an opioid use disorder. However, further investigation is required to determine what role social support and interpersonal relationships play in the initiation of opioid misuse. The Screening in Trauma for Opioid Misuse Prevention (STOMP) study aims to develop and pilot the implementation of a screening tool for opioid risk at American College of Surgeons Level I and Level II trauma centers throughout Wisconsin. The role of social supports will be investigated and considered for inclusion within the piloted screening tool.

**Methods:** The STOMP study enrolled a total of 295 patients with traumatic injuries from the University of Wisconsin Hospital Trauma and Orthopedic Surgery Services. Eligible and consenting patients completed standardized measures for socio-demographics, substance use history, opioid misuse risk, mental health, medical history, and injury and pain severity. In order to analyze the role of social support among traumatic injury patients, the Interpersonal Support Evaluation List-12 (ISEL-12) was administered during the baseline visit. The ISEL-12 scores reflect the social support present at the time of the initial traumatic injury. In 207 patients, COMM scores 6 months post-discharge and ISEL-12 were evaluated as both primary independent and dependent variables with marital status, morphine equivalent daily dose (MEDD) at baseline (24 hours pre-discharge), opioid use at 6 months post-discharge, pre-injury depression and anxiety (composite PHQ-9 and GAD-7), and discharge pain intensity as clinically relevant covariates.

**Results:** Multiple regression analysis revealed that ISEL-12 ( $\beta = -0.155$ ;  $p = 0.02$ ) and depression/anxiety ( $\beta = 0.316$ ;  $p < 0.001$ ) were significant predictors of COMM scores 6 months post-discharge ( $R^2 = 0.213$ ). Additionally, when controlling for pre-injury depression and anxiety, patients who met COMM cut-off criteria (score  $\geq 9$ ) for aberrant behaviors associated with opioid misuse ( $N = 16$ ), had significantly lower baseline ISEL-12 scores ( $F(1, 206) = 7.166$ ,  $p = 0.008$ ) than negative patients ( $M = 23.63$ ,  $SD = 7.44$  versus  $M = 29.67$ ;  $SD = 6.17$ , respectively).

**Conclusions:** Baseline ISEL-12 scores were negatively related to COMM scores 6 months post-discharge, indicating that higher baseline levels of perceived social support are associated with lower risk for aberrant behaviors associated with opioid misuse. Additionally, baseline levels of perceived social support were significantly lower in patients who met COMM cut-off criteria at 6 months post-discharge.

These findings indicate that the perceived presence and quality of social support within an individual's life may play an important role surrounding the initiation of opioid misuse and should be considered in screening for risks related to potential opioid misuse.

**Summary:** The Screening in Trauma for Opioid Misuse Prevention (STOMP) study aims to create and implement an opioid misuse screening tool at Level I and II trauma centers throughout Wisconsin. This poster presents data surrounding the role of social supports in the presence of traumatic injury. This data is relevant to clinical practice, research, and education as it is important for clinicians to understand how the role of perceived social support impacts the potential initiation of opioid misuse.

**Funding Sources:** Wisconsin Partnership Program - Grant #3152

## Poster 58: Severe Phenibut Withdrawal: A Case Report and Literature Review

**William Wolters, DO**, *University of Kentucky*; **Derek Gilbert, MD**, *University of Kentucky*; **Lon Hays, MD, MBA**, *University Kentucky*

**Background:** Phenibut (4-amino-3-phenyl-butyric acid, PHB) is one of many novel agents that is growing in popularity as a supplement readily available online and is a great example of the changing landscape of substance use disorders. PHB is an analog of gamma-aminobutyric acid (GABA) that acts primarily as a GABA-B agonist similar to that of Baclofen. At high concentrations, PHB can also affect the GABA-A receptor in a way that is akin to benzodiazepines and alcohol. Furthermore, like Gabapentin and Pregabalin, PHB can interact with the alpha1-delta subunit-containing voltage-dependent calcium channels. Given these similarities, PHB is marketed as a supplement that can be used to help treat anxiety, insomnia, and alcohol withdrawal amongst other proposed indications. Not unexpectedly, the actions of PHB on the central nervous system can lead to the potential for misuse, intoxication, and withdrawal.

**Methods:** We collaborated with Family Medicine Inpatient Treatment Team, Critical Care Pulmonary ICU Team, Poison Control Center, and Adult Psychiatric Consult Treatment Team to perform a thorough medical workup for acute psychosis and encephalopathy in the setting of recent PHB withdrawal. We utilized Pubmed for our literature review.

**Results:** Our patient is a 34-year-old male with past psychiatric history significant for anxiety, depression, obsessive-compulsive disorder, and antisocial personality disorder who presented with acute onset auditory and visual hallucinations, tremor, agitation, and altered mental status secondary to PHB withdrawal. The patient reported taking up to 34 g per day of PHB (normal dose listed as 1-3g per day); this was verified by the patients wife. On admission the patient became increasingly agitated and required IM Haldol, Ativan, and Benadryl as well as 4-point restraints. EKG demonstrated NSR with QTc 484, troponins negative, CT head negative for acute process, ammonia negative, Hep panel and HIV negative, CK 78. Initial UDS was unable to be obtained; however UDS on hospital day #3 was positive for acetaminophen, caffeine, diphenhydramine, escitalopram, hydroxyzine, and lorazepam. There was some initial concern for serotonin syndrome given patient's altered mental status, tremors, ankle clonus, tachycardia, and agitation. Psychiatry was consulted and recommended holding the patient's home Lexapro, BuSpar, and Abilify and treating the patient with benzodiazepines based on Clinical Institute Withdrawal Assessment (CIWA) scores given the suspicion that PHB could mimic the withdrawal from benzodiazepines or alcohol. Psychiatry also recommended Baclofen, as this has been used for GABAergic withdrawal symptoms. The patient was then transferred to the ICU due to increasing tachycardia, diaphoresis, agitation, and respiratory distress. He also experienced several episodes of tonic-clonic activity lasting several seconds at a time, one of which was accompanied by incontinence. While in the ICU he was started on a Dexmedetomidine drip which was weaned off within 24 hours. After an eventful 8 day hospital course the patient's mental status began to improve and on the day of discharge, he was no longer scoring on CIWA, was not exhibiting withdrawal symptoms, and was determined to be functioning at his baseline.

**Conclusions:** PHB is a GABA-B agonist that was developed in the Soviet Union in the 1960s and has been used to treat a variety of conditions- anxiety, insomnia, and PTSD and is not an approved medication in Western countries (BMJ Case Rep. 2013). This particular case demonstrates the risk for severe withdrawal.

**Summary:** Given the changing landscape of substance use disorders physicians must stay current on the agents growing in popularity. PHB is easily accessible online and has a potential for misuse, intoxication, and significant withdrawal that could prove life threatening

**Funding Sources:** None

## Poster 59: Subcutaneous buprenorphine for a patient with a history of misusing an indwelling catheter: A case report

**Pantea Farahmand, MD**, *Boston Medical Center*; **Jungjin Kim, MD**, *Partners Health/ Harvard Medical School*; **Claire Twark, MD**, *Brigham and Women's Hospital/Harvard Medical School*; **Joji Suzuki, MD**, *Brigham and Women's Hospital*

**Background:** As the number of opioid-related hospitalizations increase nationally, there is a growing consensus for the need to address opioid use disorder (OUD) in the hospital setting (Saitz 2019). Herein, we describe a case of a patient with OUD and ulcerative colitis who required intermittent placement of a peripherally inserted central catheter (PICC) line for total parenteral nutrition (TPN). In order to assure adherence to buprenorphine treatment, the patient was transitioned from sublingual buprenorphine (SL) to subcutaneous (SC) buprenorphine.

**Methods:** This is a case report in which consent was obtained from the patient.

**Results:** The patient was transitioned to subcutaneous buprenorphine and was able to successfully abstain from illicit substance use and injecting opioids into her PICC line. When she returned for a second medical hospitalization a month later, she reported continued abstinence from illicit opioids that was corroborated by the urine drug screen.

**Conclusions:** SC buprenorphine has the potential to improve adherence to buprenorphine treatment and reduce the risk of PICC misuse for patients who needs long-term PICC placement.

**Summary:** This case presentation illustrates new ways of expanding substance related treatments to medical services, and improving medical outcomes in PWID. This case also provides evidence for the cost effectiveness of having long acting versions of medication assisted treatments for substance use disorder available in hospitals.

**Funding Sources:** None



## Poster 60: Survey of the Barriers to Buprenorphine/Naloxone Prescribing in our Emergency Department at Freeman Health System

**Jordan Stanton, DO**, *Ozark Center Psychiatry Residency Program*; **Nauman Ashraf, MD**, *Ozark Center*; **Ben Cesarz, DO**, *Freeman Health System*

**Background:** In 2017, the number of overdose deaths involving opioids were found to be six times higher than in 1999.<sup>1</sup> According to National Institute on Drug Abuse, more than 130 people in the US die after overdosing on opioids every day.<sup>2</sup> There are two medications that are approved for opioid maintenance treatment for Opioid Use Disorder (OUD) - methadone and buprenorphine (generally dispensed as buprenorphine/naloxone.) Buprenorphine/naloxone has been shown to be a long term and effective solution to treat Opiate use disorder.<sup>3</sup> Although effective treatments are available, these treatments are underutilized in the setting of the Opioid epidemic. <sup>4</sup> People who have OUD often go to the Emergency Department (ED) for evaluation of medical concerns. Therefore, the ED has an opportunity to screen for this disorder and initiate the appropriate treatment. The ED can effectively diagnose and begin the treatment of OUD. D'Onofrio et al., did a study that randomized OUD patients into one of three groups: referral, brief intervention or ED-initiated buprenorphine followed by 10 weeks of continued buprenorphine treatment in a primary care setting.<sup>3</sup> Patients that received ED-initiated buprenorphine with continuation in primary care were more likely to still be engaged in treatment thirty days after being started on it than those in the brief intervention or referral group.<sup>3</sup> There is a clear benefit to diagnosing OUD and facilitating treatment with Buprenorphine/Naloxone right from the Emergency Department. It is hoped that by analyzing our local Hospital Emergency Room barriers to prescribing buprenorphine/naloxone, we can identify opportunities for education and stewardship in an effort to combat the opioid epidemic.

**Methods:** A brief survey was provided to the Emergency Department providers at our local Emergency Departments. The survey collected demographics such as gender, years as a practicing provider and if they are waived or not. The survey then provided a number of possible barriers to prescribing buprenorphine-naloxone and the provider was asked to put a check mark next to the barrier they identified with. A space was provided for providers to list barriers not included in the survey.

**Results:** We provided a survey to 25 providers in the Emergency Department at Freeman Hospital in Joplin and Neosho Missouri. Of the 18 providers that responded to the survey, none were buprenorphine-naloxone waived. Of the providers, 9 were male and 9 were female. The number of years as a practicing provider was charted and it varied between 2 and 22 years. The number one barrier identified by providers in the Emergency Department was lack of training on how to initiate buprenorphine-naloxone. The next most common barrier identified by providers was lack of confidence in the ability to manage Opioid Use Disorder. The third-most common barrier identified was lack of education about buprenorphine-naloxone as a method of treatment. Providers also often cited the barriers of constraints on caring for Opioid Use Disorder patients and concerns about diversion/patient reselling the drug.

**Conclusions:** The study found that there are many barriers keeping providers from initiating buprenorphine-naloxone treatment for Opioid Use Disorder. Most barriers that were identified can likely be addressed with provider education. Creation of a guideline for initiating buprenorphine-naloxone treatment written specifically for the Emergency Department could help overcome the majority of the identified barriers. Guidelines for prescribing as well as resources of outpatient follow-up could provide further help to overcome these barriers. None of the providers that participated in the survey were waived to prescribe buprenorphine-naloxone for Opioid Use Disorder. Future studies could investigate whether buprenorphine-naloxone waived providers identify the same barriers to buprenorphine-naloxone prescribing in the Emergency Department.

**Summary:** This study has identified barriers current providers face when prescribing buprenorphine-naloxone. Identifying these barriers has aided in recognizing gaps in current care for Opioid Use Disorder. This data will be used to create a guideline to provide better care of Opioid Use Disorder patients moving forward as well as to identify areas of opportunity for further education. Further education will include a presentation to the Emergency Department staff to encourage providers to seek out buprenorphine-naloxone waiver training as well as education regarding accurate diagnosis of Opioid Use Disorder in the Emergency Department setting and utilization of our Emergency Department Management of Opiate Use Disorder guideline to improve care of this patient population.

**Funding Sources:** None

## Poster 61: The Addiction Mini-Residency: An Interprofessional Staff Development Workshop

**Gabriela Garcia Vassallo, MD**, *Yale University*; **Brent Moore, PhD**, *Yale University School of Medicine/ VACTHS*; **Christine Lozano, PsyD**, *Yale University School of Medicine/ VACTHS*; **Sarah Sorenson, LCSW**, *OARS Clinic/VHA West Haven*; **Serrita Jane, PhD**, *Yale University School of Medicine/ VACTHS*; **Heather Fries, BA**, *Yale University School of Medicine/ VACTHS*; **Lauretta Grau, PhD**, *Yale School of Public Health*; **Pradeep Mutalik, MD**, *VA Connecticut Scan Echo, VA Medical Center West Haven*; **Ellen Edens, MD, MPE**, *Yale University*

**Background:** Medications for the treatment of opioid use disorders (OUD) are first line treatments and provision of them is standard of care. Despite this, the number of healthcare providers that prescribe medications for OUD is being outstripped by demand. Public health initiatives are advocating for expanded OUD treatment to primary care and general mental health settings, using familiar principles of chronic disease management. Such management requires interprofessional teams including nursing, medicine, pharmacy, social work, etc. It also requires a baseline knowledge of and framework for the treatment of SUD as a chronic condition. Here, we describe an interprofessional workshop designed to improve interprofessional staff knowledge and confidence in identifying and treating OUD.

**Methods:** A 2-day workshop, titled 'Addiction Mini-Residency' was developed by an interprofessional substance use disorder-specialty team with a goal to 'increase agency and optimism in treatment substance use disorders.' Varied educational strategies were used including pre-work audio clips, in-class lectures, videos, facilitated discussions, patient panels, and simulations. Three simulations led interprofessional teams through the diagnosis, medication consent and initiation, and follow-up treatment plans for a patient with OUD. Pretest and posttest surveys assessing participant attitudes and self-rated performance measures were collected over 3 workshops.

**Results:** We conducted five, 2-day mini-residencies. 81 participants attended one of the five trainings with over 90% (n= 73) completing both days. For the first mini-residency, participants reported increased self-efficacy in: assessing, screening, intervening and in using motivational interviewing skills with patients with SUD. Across the next four trainings prescribers (physicians, physician assistants, and nurse practitioners) and non-prescribers (psychologists, pharmacists, RN's, social workers, health technicians, and trainees) reported significant increases in: perceived effectiveness in helping patients with both alcohol use disorder (AUD) and OUD ( $p < .001$ ), self-efficacy of screening OUD ( $p < .001$ ), self-efficacy diagnosing AUD ( $p = .001$ ) and OUD ( $p < .001$ ), self-efficacy discussing treatment options and treating AUD ( $p < .001$ ) and OUD ( $p < .001$ ) and providing or assisting with the provision of Buprenorphine for OUD ( $p = .003$ ). 39% of providers completed Buprenorphine waiver training prior to enrollment and over 70% of those without training reported an interest in completing waiver training post workshop. Feedback from participants was collected and will be presented in the poster.

**Conclusions:** This 2-day interprofessional workshop on SUD treatment had a positive impact on staff understanding of SUDs and the specific rolls and teamwork required to prescribe medications for OUD in primary care and general MH settings. This kind of experience will foster staff preparedness and willingness to conceptualize OUD as a chronic condition amenable to treatment in primary care and general MH settings.

**Summary:** We proposed to develop, implement and evaluate a hospital wide, interprofessional workshop designed to improve healthcare staff knowledge and confidence in identifying and treating OUD. The 2-day workshop had a positive impact on staff understanding of OUD and highlighted the benefits of working as a team in order to effectively manage this patient population. This type of educational experience may foster staff preparedness and willingness to conceptualize OUD as a chronic condition amenable to treatment in primary care and general MH settings. Our long term goal is to disseminate the 2-day workshop to other healthcare institutions in efforts to address the growing need for addiction treatment

**Funding Sources:** None

## Poster 62: The Effect of Baseline Insomnia and its Treatment on the Ability to Quit Smoking

**Maher Karam Hage, MD**, *UT MD Anderson Cancer Center*; **Kareem Seoudy, MD**, *UT MD Anderson Cancer Center*; **George Kypriotakis, PhD**, *UT MD Anderson Cancer Center*; **Diane Beneventi, PhD**, *UT MD Anderson Cancer Center*; **Jennifer Minnix, PhD**, *UT MD Anderson Cancer Center*; **Jason Robinson, PhD**, *UT MD Anderson Cancer Center*; **Janice Blalock, PhD**, *UT MD Anderson Cancer Center*; **Young Cui, PhD**, *UT MD Anderson Cancer Center*; **Paul Cinciripini, PhD**, *UT MD Anderson Cancer Center*

**Background:** 40% of cigarettes sold in the US are consumed by people with history of current mental health disorders including insomnia. Cigarette smoking is associated both with difficulty initiating and maintaining sleep. Conversely, individuals with insomnia symptoms are less likely to quit smoking and more likely to relapse to smoking.

**Methods:** To examine the effect of insomnia on smoking abstinence rates at 3, 6, and 9 months during and following tobacco treatment, we compare patients with insomnia vs. those without insomnia at baseline, and patients with insomnia who were treated (counseling and pharmacotherapy) vs. those not treated. This case-control analysis used data collected from 2006 to 2018 at MD Anderson Cancer Center's Tobacco Treatment Program. Patients who scored 12 or more on the Jenkins Sleep Questionnaire were considered to have insomnia and were referred for onsite psychiatric evaluation and treatment. Self-reports of patients' smoking abstinence were obtained independently by clinical support staff and verified by CO measurement at in-person follow-ups and then by phone at 3, 6 and 9 months from consultation.

**Results:** From a total sample of 6,141, those who had insomnia at baseline 2,532 were less likely to abstain from smoking than those who did not have insomnia 3,609 ( $p < 0.001$ ). This was consistent at 3 months (end of treatment), and at 6- and 9-month time points. At the 9-month follow-up point, patients who underwent treatment for insomnia had higher abstinence rates than those who were not treated (33% versus 27%  $p < 0.05$ ).

**Conclusions:** Having insomnia at baseline correlated with low abstinence rates at all time follow-ups. Among patients with, the 9-month smoking abstinence rate of those treated was significantly better than those untreated.

**Summary:** Poster presentation aiming to highlight the importance of diagnosing and treating insomnia as it has deleterious effects on many aspect of patients' life including in this case ability to quit smoking

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## Poster 63: The Importance of Continuing Care in Substance Abuse: A single Center Experience

**Jasper Werby, BA**, *Northwestern University Feinberg School of Medicine*; **Jeffrey Caldcleugh, LSW**, *Positive Sobriety Institute*; **Daniel Angres, MD**, *Positive Sobriety Institute*

**Background:** Substance abuse is a major problem within this country, taxing in both human lives and healthcare expenditures. An area of research that has been explored previously is the idea of what predicts whether someone will relapse or not. Continuing care is the collection of programming after a more intensive program such as partial hospitalization or day program. This study examines the impact of continuing care on relapse rate while adjusting for multiple other predictors of relapse. By understanding the impact of continuing care on patient outcomes, this work has utility in helping patients engage with informed decisionmaking in terms of next steps.

**Methods:** This study was conducted at the Positive Sobriety Institute which treats a higher proportion of doctors and medical professionals with a range of techniques including mindfulness based treatment. 630 patients with predominantly alcoholism and/or opiate addiction were enrolled in the study over the course of 4 years and shared their demographic data. Their data was then analyzed using STATA with logistic regression and 2 sample t-tests, and non parametric tests when appropriate. The logistic regression was constructed by first assessing for significant variables that were collected using a univariate analysis, and constructed in a manner elaborated by Zhang et al to create a model with the least factors possible while preserving predictive utility.

**Results:** A univariate analysis was conducted, showing that continuing care ( $z=-9.94$ ,  $p=0.000$ ), motivation from work, type of employment, marital status, length of stay in the program, living status, drug of choice, state of residency, and polysubstance abuse were all significant factors in predicting relapse. When input into a logistic regression, continuing care, age, stimulant use, Illinois residency and not being a medical professional were all significant. However, reductions guided by goodness of fit analysis showed two significant variables in the logistic regression, continuing care ( $OR .128$ ,  $z=-8.85$ ,  $p=0.000$ ) and being a non medical professional compared to the doctors and medical professionals in the program ( $OR=2.855$ ,  $z=4.49$ ,  $p=0.000$ ,  $GOF p=.031$ ). Without continuing care in the model compared to all other significant predictors, the pseudo R squared dropped by 40.3% (.2705-->.1614), a larger drop than with any other variable.

**Conclusions:** These data show that continuing care is a vital aspect of treatment in the addiction setting. With this data, it can be used in informed decisionmaking with patients as they decide whether to do continuing care or not. This data could help explain why there is generally such a disparity between physician and non physician outcomes as typically physicians are mandated to continuing care whereas it is a choice for non physicians. Given this data, there is no single action that would better serve their recovery than engaging with continuing care.

**Summary:** Continuing care is an essential component of an addiction program. The continuing care program at PSI leads to significantly better outcomes for patients, both medical professionals and non medical professionals alike. This paper suggests the importance of continuing care in both outcome data as well as in logistic regressions predicting for relapse where continuing care was the single most important variable assessed. It also highlights several other important variables for a logistic regression predicting relapse, including age, what type of drug was used, Illinois residency, and reinforces the trend in the literature that shows medical professionals have better remittance rates than non medical professionals.

**Funding Sources:** None

## Poster 64: The Pharmacology of Psychology. Adapting "Readiness to Change" to Compartmental Analysis

**Tooba Qadir, MD**, *Rutgers New Jersey Medical School*; **Muhammad Aadil, MD**, *Rutgers New Jersey Medical School*; **Huda Fatima, MBBS**, *Dow Medical College*

**Background:** The purpose of this study is to review the factors involved in early drop out in buprenorphine/Naloxone treatment in an outpatient clinical setup.

**Methods:** Clinical trials (including randomized controlled trials (RCTs), quasi-randomized controlled trials, open-labeled trials, quasi-controlled trials, observational studies, and cohort pre- and post-treatment studies) and review papers were searched from Medline, Cochrane Clinical Trials, Cochrane Database of Systemic Reviews and Embase. We used the terms ("Buprenorphine/Naloxone" OR "suboxone" OR "outpatient") AND ("compliance" OR "opioid maintenance therapy"). A time frame limit of five years was applied, and 10 studies were identified based on the selection criteria.

**Results:** Most studies showed that within six month of duration 42% to 62 % patient left the treatment. Multiple risk factors were identified which included disagreement with treatment plan or program staff, program conflict with social life/work/school or college obligations, missing too many days at school, legal problems, side effects of medications, poor transport and another medical or psychiatric problem affecting compliance. Young age and history of polysubstance use were the most important predictors of early dropout.

**Conclusions:** Over half of the patients started on buprenorphine/suboxone treatment in outpatient setting dropout within first six months. Programs should carefully assess these barriers to improve the compliance rate. More studies are required with patient centered focus to assess these barriers and how to improve the compliance rate.

**Summary:** Extensive research must be conducted to analyse and improve rates of adherence to outpatient opioid treatment programs. We need wide-scale education and counselling focused on positive reinforcement and de-stigmatizing opioid use.

**Funding Sources:** None



## Poster 65: The Powerful Influence of Medication Prior Authorization Requirements in American Psychiatry

**Brian Barnett, MD,***Cleveland Clinic*

**Background:** Given concerns about medication prior authorizations (PAs) and other payor cost containment strategies negatively impacting patient care and contributing to inefficient delivery of healthcare, they are gaining increasing attention from medical professional organizations. However, we are unaware of any peer-reviewed, nationwide studies assessing the experience and perceptions of psychiatrists regarding medication PA requirements. To help address this important gap in the literature, we electronically surveyed a random sample of psychiatrist members of the American Psychiatric Association about this issue. This presentation will inform clinicians regarding the impact of a managed care technique that they frequently encounter, but may have given little thought to in terms of its broader impact. It will raise awareness about this underappreciated issue and hopefully help catalyze advocacy efforts focused on reforming the current PA system, especially for patients being treated with Medication Assisted Treatment for opioid use disorder, where delays in treatment can mean life or death.

**Methods:** 1,000 members of the American Psychiatric Association were invited to take an anonymous 26-item Internet-based survey, which inquired about respondent factors including age (in 10-year intervals), gender, number of years treating psychiatric patients, state of primary practice, primary treatment setting, what percentage of medication PA requests the respondent completed themselves versus with assistance of other staff members, and to what percentage of patients in their practice the respondent prescribed medications. Additional questions assessed respondent opinions about the perceived effects of PA requirements on themselves, their patients, and the health care system as a whole. Questions dealing with frequency were answered on a four point frequency scale ranging from “never” to “very rarely” to “occasionally” to “often”. Questions asking about opinions were answered via a five-point Likert-type scale ranging from “strongly disagree” to “strongly agree”, with slight adaptations for some questions. Summary statistics were calculated and presented.

**Results:** The response rate was 33.1%. Most respondents (57.3%) completed PA requests without any assistance, while 15.3% had an assistant who completed most or all of them. Respondents (or their assistants) completed  $78.9 \pm 32.1\%$  of PA requests they were presented with in the previous three months, with 9.1% of respondents completing none of the requests they received and 46.4% completing all of them. 49.1% of respondents reported that PA requests had increased markedly over the previous five years, while 28.8% reported they had increased somewhat, 18.0% that they were unchanged and 4.2% that they had decreased somewhat or markedly. Nearly all respondents reported that PAs either significantly (47.7%) or somewhat (45.8%) reduce job satisfaction, while 0.9% reported that it either somewhat or significantly increases it. More than half of respondents reported that completing PA requests either decreases the amount of time with patients to a significant extent (22.8%) or “more than a little” (31.8), while 17.3% said that it has no effect and 0.9% said it somewhat or significantly increases it. 83.7% of respondents reported that PA requirements have a predominantly negative effect on quality

of patient care, with 15.4% reporting no effect and 0.9% reporting a predominantly positive effect. 81.5% of respondents strongly disagreed with the statement: The requirement for medication PAs increases the safety of patients under your care, while 11.1% moderately disagreed, 4.6% were neutral, and 2.8% moderately or strongly agreed. 46.1% strongly disagreed with the statement: The requirement for medication PAs has reduced the overall cost of treatment to the health care system for patients under your care, while 20.7% moderately disagreed, 19.2% were neutral, 12.1% moderately agreed, and 1.9% strongly agreed. 66.5% of respondents reported either often or occasionally refraining from prescribing a preferred medication because of a PA requirement or anticipation of one. 44.9% of respondents reported either often or occasionally finding it necessary to modify a patient's diagnosis to obtain PA. 43.1% of respondents found it necessary to misrepresent a patient as having failed trials of other medications to obtain PA.

**Conclusions:** This study details the perceptions of a national sample of American psychiatrists concerning the impact of PA requirements on themselves and their patients. Overall, respondents hold predominantly negative views about PA requirements and are skeptical about claims that they decrease health system spending or increase patient safety. This study was unique in its finding of a large number of respondents who reported occasionally or often refraining from prescribing a preferred medication because of a PA requirement or anticipation of one. This raises concerns about whether PA requirements are preventing psychiatric patients from receiving the most effective medications for their conditions. Slightly less than half of respondents reported engaging in some type of deception occasionally or often in order to successfully obtain PA. Our study demonstrates that American psychiatrists do not view the current PA system as an effective, safe or efficient method to address our healthcare system's rising medication expenditures. Therefore, it is essential that advocacy groups begin working with payors to find an alternative solution.

**Summary:** Medication prior authorizations (PAs) are a common part of American general and addiction psychiatric practice. Despite this fact, they have been only minimally studied in the academic literature. Previous studies have shown associations between prior authorization requirements and negative outcomes for patients with a variety of mental illnesses and addictions. Since no national study has been undertaken of psychiatrists to explore their opinions about and experiences with PAs, we conducted a national survey of members of the American Psychiatric Association. Respondents to our survey overwhelmingly felt that PA requirements negatively affect patient care and diminish job satisfaction. A majority also acknowledged that they occasionally or often refrain from prescribing what they consider to be the preferred medication for treatment of a patient's condition due to a PA requirement or the expectation of one. A large minority of respondents reported employing deception occasionally or often when submitting PA requests. Overall, our findings support the need for the development of alternatives to the current PA system to control medication costs.

**Funding Sources:** None

## Poster 66: Tobacco Use in the ADATP (Alcohol and Drug Abuse Partial Hospital Program) at McLean Hospital

**Christoforos Iraklis Giakoumatos, MD**, *Massachusetts General Hospital/Harvard Medical School*; **Jessica Lareau, MSW**, *McLean Hospital*; **Olivera Bogunovic, MD**, *McLean Hospital/Harvard Medical School*

**Background:** Across the world, 6 million people die every year from tobacco use, and it has been estimated that tobacco use will be responsible for more than 8 million deaths annually by 2030. Smoking is the leading cause of preventable death in the US. Among the US adults, 15.1% of them (36.5 million people): 16.7% of the men and 13.6% of the women were smoking cigarettes in 2015. In 2013, it was estimated that 36.5% of adults with any mental illness were using tobacco compared to 25.3% of adults with no mental illness. This project was inspired by the clinical observation of some patients starting using tobacco products or increase their use of such products while enrolled in different addiction treatment programs. This project intended to enhance our understanding of that phenomenon and explore ways in which we can intervene as clinicians.

**Methods:** We created a questionnaire to assess tobacco use (smoking, smokeless and vaping) at the time of admission to the ADATP (Alcohol and Drug Abuse Partial Hospital Program) and while attending the program. We also asked participants whether they used their own tobacco products or if others gave them theirs and if they used tobacco products as a way to socialize with other patients. Prior to this QI project there was a tobacco cessation group that was taking place at variable intervals. We first administered this questionnaire for 3 months prior to implementation of a weekly tobacco cessation group and then we administered it again for another 3 months while a weekly tobacco cessation group was occurring. The group would assess current and prior tobacco use, prior attempts to decrease or cease tobacco use and willingness to decrease/cease tobacco use if patients were smoking at the time of the group. We used motivational interviewing techniques to assess such readiness. We also provided information around medications that can help with their efforts; such as nicotine replacement therapy, varenicline and bupropion.

**Results:** Prior to implementation of the tobacco cessation group: 15 patients completed the questionnaire. Out of them 10 were using tobacco products on the day of admission to the program. 1 patient quit while attending the program. Out of those 9 remaining patients, 3 increased their use of tobacco, 1 decreased it and 5 continued to use the same amount. All of them used their own tobacco products. The majority (55.5%) reported using tobacco as a way to socialize with others. After the implementation of the tobacco cessation group: 25 patients completed the questionnaire. Out of them 13 were using tobacco products on the day of admission to the program. 3 patients quit while attending the program, and 1 patient started using tobacco products while attending the program. Out of the 11 patients who were smoking while attending the program, 1 increased their use of tobacco (the patient that picked up tobacco use), 2 decreased it and 8 continued to use the same amount. 10 out of 11 were using their own tobacco products. The majority (63.6%) reported using tobacco as a way to socialize with others.

**Conclusions:** Our project showed that some patients (3 pre- and 1 post-implementation of the weekly tobacco cessation group) increased their use of tobacco products while in a partial hospitalization program targeting substance use disorders. It also showed that the majority of the patients (55.5% pre- and 63.6% post-implementation of the weekly tobacco cessation group) used tobacco products as a way to socialize with others. None of these results are significant however. There is a trend showing that the group we implemented might have helped in decreasing how many patients start using/increase their use of tobacco products but did not appear to help with the use of tobacco in a more social way.

**Summary:** It has been our clinical observation that some patients start using tobacco products or increase their use of such products while enrolled in different addiction treatment programs. This project intended to enhance our understanding of that phenomenon and explore ways in which we can intervene as clinicians. More studies are needed to explore what drives tobacco use (perhaps variations by age or gender) while attending a program to help with substance use disorders and how we as clinicians can be most helpful. Additionally, it would be interesting to see if patients would end up using fewer tobacco products if offered an indoor space where they could spend their break time (perhaps with equipped with a television, video games and/or computer).

**Funding Sources:** None

## Poster 67: Treatment of Nicotine Dependence by Child and Adolescent Psychiatrists

**Martha J. Ignaszewski, MD**, *Boston Children's Hospital*; **Oscar Bukstein, MD, MPH**, *Boston Children's Hospital/Harvard Medical School*

**Background:** Nicotine use has been found to be more prevalent among patients with psychiatric disorders, and has been found to negatively impact mental health. Nicotine use has been associated with comorbidity, symptom severity, is a risk factor for substance use disorder and relapse, as well as affective disorders, self-harm and suicide rates. The long term consequences of tobacco use are well established, and these patients are at increased risk for cardiovascular disease, pulmonary disease, and cancers with premature mortality. Clinical Practice Guidelines instruct physicians to ask their patients about smoking and to advise against tobacco use. Providers are urged to attend to adolescents because of increased susceptibility to smoking. Early use of tobacco products in childhood and adolescence predicts future nicotine use. Though smoking has been decreasing in youth populations, noncombustible products are being increasingly used for nicotine delivery.

**Methods:** PubMed literature review was performed searching for tobacco, nicotine, smoking, screening, treatment, cessation, and psychiatry, pediatrics, child and adolescent. We summarize the literature associated with nicotine cessation curricula in psychiatric, pediatric and child and adolescent psychiatric training.

**Results:** A survey of psychiatry trainees revealed that 76% of trainees reported their overall ability to help patients cease nicotine use as fair or poor, reporting limited training during medical school and residency. Other research suggests that while 80% of psychiatric providers ask about smoking status, less than 34% recommend nicotine replacement, prescribe pharmacotherapy, or refer smokers for further treatment. Assessment of tobacco treatment in youth mental health settings has received little investigation, and has traditionally been a neglected diagnosis. Studies show that the rate of screening and diagnosis, provision of evidence based recommendations around nicotine cessation, and prescribing of nicotine replacement therapy and other pharmaceutical agents to improve abstinence has increased among pediatricians and psychiatrists following specific training. Programs with nicotine specific treatment programs had more favourable attitudes towards addressing tobacco with increased confidence in resident skills. There is more limited guidance around treatment of non-combustible tobacco products.

**Conclusions:** In spite of longstanding guidelines, there is a paucity of literature investigating nicotine dependence and treatment recommendations among child and adolescent psychiatrists. Adolescent mental health settings are key venues to screen for tobacco use with increasing rates in programs with nicotine cessation training. Training offers the potential of delivering treatment to one of the largest remaining groups of smokers: patients with mental disorders. The research findings indicate the need and interest for tobacco treatment curricula in psychiatric and pediatric training programs. More information is needed about child and adolescent psychiatry providers approaches and attitudes to

nicotine screening, evaluation of dependence, treatment recommendations and adherence to clinical guidelines.

**Summary:** Poster presentation to highlight limited evidence base for child and adolescent psychiatric treatment of nicotine dependence, through a literature review.

**Funding Sources:** None

## Poster 68: Trends in Opioid Overdose Deaths among Older Adults in New York City

**Pallavi Joshi, DO, MA**, *Northwell Health-Staten Island University Hospital*; **Robert Rymowicz, DO**, *Rutgers-NJMS*; **Elizabeth Fam, BA**, *Rutgers-NJMS*

**Background:** Opioid Use Disorder (OUD) is increasing among older adults, which compounds the risk of overdose, falls, cognitive impairments, and drug interactions in this vulnerable population. Older adults are more vulnerable to consequences of unintentional drug overdose, including death. Over the past few years, the rise of fentanyl compounds has increased the rates and risk of unintentional overdose. The aims of this study are to: examine the trends in unintentional overdose deaths among older adults living in New York City; and understand how heroin and fentanyl contribute to overdose deaths in this population.

**Methods:** We present a descriptive analysis of trends in unintentional overdose deaths among older adults living in New York City from 2012-2017. Overdose data was extracted from New York City Department of Health Epi Data Briefs and analyzed. The data was stratified into the following age groups: 15-34 years, 35-54 years, 55-64 years, 65-84 years.

**Results:** There were 163 unintentional overdose deaths among adults aged 55-64 in 2013 and 339 overdose deaths in 2017. There were 33 unintentional overdose deaths among adults aged 65-84 in 2013 and 83 overdose deaths in 2017. The rates of unintentional overdose among adults aged 55-64 years was generally stable between 2013 to 2015. There was an increase in the rate of overdose deaths from 9.1 in 2015 to 16.1 in 2016 (rate ratio = 1.76). During the same time period, the rate among adults aged 65-84 increased from 1.2 in 2015 to 2.6 in 2016 (rate ratio = 2.16) and 3.7 in 2017 (rate ratio = 1.42). There were 78 unintentional overdose deaths involving heroin among adults aged 55-64 in 2013 and 176 overdose deaths involving heroin in 2017. There were 13 unintentional overdose deaths involving heroin among adults aged 65-84 in 2013 and 37 overdose deaths involving heroin in 2017. There was an increase in the rate of unintentional overdose involving heroin in adults aged 55-64 from 8.2 in 2013 to 17.7 in 2017 (rate ratio = 2.15). During the same time period, the rate among adults aged 65-84 increased from 1.4 in 2013 to 3.7 in 2017 (rate ratio = 2.64). However, a similar trend was not seen in younger adults. The overdose rate among adults aged 15-34 increased from 4.8 in 2013 to 8.3 in 2016 (rate ratio = 1.72) and plateaued in 2017, and the rate among adults aged 35-54 increased from 8.2 in 2013 to a peak of 16.2 in 2016, and decreased to 15 in 2017 (rate ratio = 1.64). The rate of unintentional overdose involving fentanyl among adults aged 55-84 years increased from 1.3 in 2015 to 6.3 in 2016 (rate ratio = 4.84). The rate of unintentional overdose involving fentanyl with heroin in this age group increased from 5.8 in 2015 to 12.1 in 2016 (rate ratio = 2.08). The rate of unintentional overdose involving fentanyl without heroin in this age group increased from 0.6 in 2015 to 2.7 in 2016 (rate ratio = 4.5).

**Conclusions:** The population of older adults with OUD in New York City is increasing, and the trend is likely to continue into the next decade. Overall, there was an increasing trend of unintentional overdose deaths involving opioids among older adults. Unintentional overdose rates involving heroin are also

increasing among older adults. There has been a dramatic increase in the rates of unintentional overdose involving fentanyl, both with and without heroin, among older adults. These results highlight areas for further study including understanding how to address the increasing overdose rates among older adults and the role of fentanyl in this epidemic.

**Summary:** The study described above aims to examine the trends in unintentional overdose deaths among older adults living in New York City; and understand how heroin and fentanyl contribute to overdose deaths in this population. Opioid addiction and overdose continues to increase among older adults, but recovery efforts and access to care are limited in this age group. This study highlights areas for further intervention including understanding how to address the increasing overdose rates among older adults and the role of fentanyl in this epidemic.

**Funding Sources:** None



## Poster 69: Use of Motivational Interviewing in Adolescents with Substance Misuse in the Inpatient Setting, Review of Current Research

**Nicole Motakef, MD**, *Kaiser Permanente*; **Christine Au, DO**, *University of California, Irvine*; **Vivianne Chang, BS**, *Western University of Health Sciences*; **Maher Kozman, MD**, *Kaiser Permanente*

**Background:** Motivational interviewing (MI) has been largely accredited for its role in substance and behavioral changes. Treating substance use among the adolescence is especially crucial as it may be their gateway into worsening use, or alternatively a life-long platform for positive change. There is a great amount of research that demonstrates the efficacy of MI in encouraging change in regard to substance use and eliciting self-reflection in a non-threatening manner. MI provides a basis for treatment of adolescents that emphasizes patient-centered approaches that enhance collaboration and supporting autonomy, which then ultimately encourages adolescents to reach their maximum potential.

**Methods:** A review of national and international literature was conducted using keywords "motivational interviewing," "substance use/smoking/marijuana," "adolescent," and "inpatient," that have been published between 2008-2018. The resulting articles were organized into the following categories: qualitative measures and quantitative measures.

**Results:** With the search parameters, a total of 21 articles resulted. Of the quantitative studies, 73% reported a positive change in response to MI on substance use frequency, 72% documented a positive response to effect of MI on continued use of treatment, and 100% of studies addressing the effect of MI intervention on continued abstinence reported a positive response. Of the 5 articles discussing effect of MI intervention on various qualitative measures, 3 documented a positive change.

**Conclusions:** MI can be an effective treatment modality for substance use in adolescents and/or in an inpatient setting. This review demonstrates a positive relationship for the efficacy of MI in 82% of quantitative and 60% of qualitative assessments. Several aspects of MI make it ideal for adolescents because it has no known noteworthy adverse effects and comes at low cost for treatment. MI can be used as a brief modality that can produce lasting, positive change.

**Summary:** This review of 21 articles suggests an overall benefit to MI intervention alone for substance use in adolescents and/or in an inpatient setting.

**Funding Sources:** None

## Poster 70: What is Current and New in the Management of Opioid Use Disorder?

**Sanya Virani, MD**, *Maimonides Medical Center*; **Esther Blessing, MD, PhD**, *New York University*; **John Rotrosen, MD**, *New York University*

**Background:** Currently, drug overdoses (most of them opioid-related) are killing more Americans each year than the number that died at the peak of the HIV epidemic and during the entire 20-year duration of the Vietnam conflict. Over the past decade painkiller prescribing and related overdose fatalities have declined as its causative role has become more widely recognized, however, this continues to play a role in initiation. Rapid strides are being made to increase our current understanding of the neuropharmacological basis of opioid use disorders (OUD). Development of newer targets and testing of existing compounds approved for other indications are at the forefront of research endeavors to combat the opioid epidemic.

**Methods:** A comprehensive search was undertaken to compile and categorize information from various sources including fact sheets and reports from pharmaceutical companies, National Institute of Health Reporter database, clinicaltrials.gov website, PubMed and Google Scholar. Current and developing OUD treatments were contextualized in terms of molecular targets (e.g., opioid receptors, dopamine receptors, transporters, etc.), clinical targets (e.g., craving, withdrawal, relapse, etc.), and targets defined by the “opioid treatment cascade” (e.g., treatment engagement, initiation, retention, re-engagement, etc.). For novel drugs, special attention was paid to how these agents impact neurobiological addiction domains such as negative affect or cognitive and emotional regulation.

**Results:** Data from 214 recent and current clinical trials that informed about study designs, progress, preliminary and final findings, the rationale for use of 14 compounds, including but not limited to cannabis, psychedelics and other chemical entities for the management of OUD and withdrawal states was summarized. The most recent and relevant information about vaccines, biologicals and enzymes, apps and devices undergoing development was retrieved. Additionally, the current status and objectives of ongoing programs and initiatives clarifying specific accommodations made for special population groups like mothers, adolescents, and prisoners in the criminal justice system were delineated. Trials to expand the use of existing marketed agents and new models of care e.g. the support of the National Institute on Drug Abuse (NIDA) helping to end addiction long-term (HEAL) Initiative were described.

**Conclusions:** Authors offered insights into the future of OUD management by summarizing the latest pharmacological, digital/technological and strategic advancements in this field, and highlighted limitations and areas of further development. A broad effort supported by federal, state and local agencies, and by industry, philanthropy and public-private partnerships to develop new molecular entities working via opioid and non-opioid mechanisms has been launched. There is greater emphasis on developing new formulations of existing pharmacotherapies, behavioral interventions, devices, and mHealth applications. The focus is on vastly expanding access to effective interventions from their implementation within addiction specialty settings to mainstream primary care, HIV clinics and emergency departments, criminal justice and other community settings.

**Summary:** The proposed activity will be a poster presentation that will have the following implications for:

1. Clinical practice, research, and education: Practicing clinicians will become aware of the potential use of drugs they prescribe for other conditions in management of acute withdrawal states of OUD. They will also receive a recap of the current and most updated FDA approved guidelines for dosing regimens and maintenance strategies of OUD (methadone, buprenorphine, and naltrexone) and be informed about newer vaccines and enzymes under development.
2. Policy: Prior to the release of newer apps and technologies, there will be room for market research and the resultant policies will serve to regulate uniformity of use and ensure that minimum standards for safety and confidentiality are met. Assessments on cost-effectiveness by economists in the field, utilizing this information will determine policies around the most efficient strategies to expand access to services for the vulnerable sections of society.

**Funding Sources:** None

## Poster 71: You want me to do what??: Yale Addictions Fellowship Self-Guided Scavenger Hunt

**Ellen Edens, MD, MPE, *Yale University*; Robert Werner, MD, *Yale University*; Ismene Petrakis, MD, *Yale University***

**Background:** Innovative models of education in addiction treatment are urgently needed. U.S. medical and other professional schools are working to address the current public health opioid crisis while acknowledging the historically absent emphasis on addiction education in medical curriculum. At present, there are several factors that pose barriers to education about the treatment of substance use disorders. In many U.S. localities, there are few, if any, faculty experts to deliver curriculum and supervision, thus limiting expansion of fellowship and other training programs. In other areas, faculty experts are available, yet are concentrated in academic centers or primarily VA hospitals and unable to provide mentorship regarding community-based addiction treatment. Additionally, clinical experiences may vary widely between trainees based on a particular clinical assignment or mentor. Here we describe an innovative self-directed medical education tool designed to provide standardization to fellows' exposure to clinical skills and community-based treatment resources while also being self-directed, thus requiring minimal direct input from faculty. The Yale Addiction Fellowship Self-Guided Scavenger Hunt was pilot-tested during the 2018-2019 academic year to determine feasibility and overall educational utility.

**Methods:** Scavenger hunt items were identified based on whether the activity was perceived as an essential experience for graduation or one that was important, yet difficult to schedule in available clinical settings. After a faculty member compiled initial items, the list was reviewed and edited by faculty peers to determine the final set. Between July 1, 2018 to June 30, 2019 the Yale Addiction Treatment Self-Guided Scavenger Hunt was piloted by addiction psychiatry and addiction medicine fellows (N=10). Fellows met regularly during supervision to review and problem-solve regarding assignments. Quarterly meetings were held to receive feedback and update the list in order to provide a richer educational experience, assess barriers to engagement, and eliminate extraneous assignments. Each fellow presented on a clinically meaningful experience in an open group. Finally, a year-end focus group was held to determine feasibility, overall utility, and added value to the educational portfolio of the Yale addiction fellowships curriculum.

**Results:** Scavenger hunts are a feasible, effective, and fun way to orient addiction fellowship trainees to the local, statewide, and national addiction treatment systems and to ensure some minimal standardized learning is achieved. This low-tech, learner-driven educational tool can be adapted to local settings and foster community engagement, which is generally intensive to coordinate and may lack faculty leadership. Additionally, as fellows present back on their experiences, learning is multiplied. Fellows, faculty, and academic institutions generally, gain greater knowledge of community resources.

**Conclusions:** Scavenger hunts are a feasible, effective, and fun way to orient addiction fellowship trainees to the local, statewide, and national addiction treatment systems and to ensure some minimal standardized learning is achieved. Additionally, as fellows present back on their experiences, learning is multiplied. Fellows, faculty, and academic institutions generally, gain greater knowledge of community resources.

**Summary:** The low-tech, learner-driven nature of a scavenger hunt and its emphasis on identifying local resources, critical to providing best-practice addiction treatment, make it an ideal educational tool for addiction fellowship programs—which are often programs with limited faculty, clinical, and educational resources.

**Funding Sources:** None

## Poster 72: The Opioid Response Network: Innovations in Providing Evidence-Based Technical Assistance to Communities

**Sara L Calvin, MS**, *RTI, International*; **Karen Oliver, PhD**, *Independent Consultant*; **Kathryn Cates-Wessel, BA**, *American Academy of Addiction Psychiatry*; **Caroline Gray, MSW**, *American Academy of Addiction Psychiatry*; **Brendan Wedehase, RTI, International; **Stephen Orme, MA**, *RTI, International*; **Aimee Campbell, PhD**, *Columbia University*; **Frances Levin, MD**, *Columbia University***

**Background:** Opioid misuse and opioid-related overdoses are an ongoing crisis in the U.S. In 2017, the Substance Abuse and Mental Health Services Administration funded the Opioid Response Network (ORN) (STR-TA grant) to provide free technical assistance (TA), at the local level for evidence-based approaches to prevention, treatment, and recovery. Many TA requests are considered “intensive,” meaning they require multiple activities, cross-system implementation, and sustainability planning. We will describe intensive TA characteristics, innovations, and strategies to meet communities’ needs related to Opioid Use Disorder (OUD) prevention, treatment, and recovery.

**Methods:** The ORN TA framework divides the country into geographic regions, each region is managed by a Technology Transfer Specialist (TTS) and each request via the ORN website is assigned to a specific TTS. TTSs then identify local consultants to respond to requests. TA recipients receive a survey directly after, 3-, and 6-months post request completion.

**Results:** 750 people have received intensive TA consultation from 188 requests, with the potential reach of almost 50,00 people. Examples of intensive TA include implementing statewide call center facilities “warm” hand-offs and developing and implementing telehealth services for adolescents with OUD in rural communities. Additional data for the presentation will include descriptions of intensive TA requests and of persons surveyed will be provided. Discussion of additional requests will emphasize implementation strategies, culturally intelligent approaches, and the breadth of populations served.

**Conclusions:** Discussion of intensive TA can help inform clinicians of implementation strategies their communities can select, implement, and use to overcome barriers to OUD prevention, treatment, and recovery. We will also highlight ORN resources available specifically to address implementation of medications for OUD, and ways to address stigma. This information may help clinicians identify resources available to their patients, communities, and states or territories.

**Summary:** The Opioid Response Network provides free technical assistance of evidence-based prevention, treatment and recovery approaches to local communities. Reviewing both the Technical Assistance framework and innovative and intensive TA requests to date, we are able to understand the scope of how implementation strategies and sustainability planning can both impact sustainability and begin to identify and address barriers to care.

**Funding Sources:** None

## Poster 73: A Needs assessment of MAT Education Among a Health Providers Who Work with Interprofessional Learners.

**Martin Leamon, MD**, *University of California Davis, UC Davis Health System*; **Debra Bakerjian, PhD, APRN, FAAN, FAANP, FGSA**, *UC Davis Betty Irene Moore School of Nursing*; **Gerald Kayingo, PhD, MMSc, PA-C**, *UC Davis Betty Irene Moore School of Nursing*; **Jennifer Edwards, MS, RN**, *UC Davis Betty Irene Moore School of Nursing*; **Ana Marin, MPH**, *UC Davis Betty Irene Moore School of Nursing*; **Carter Yang, MPH**, *UC Davis Betty Irene Moore School of Nursing*

**Background:** Medication-assisted treatment (MAT) with buprenorphine is widely acknowledged as effective treatment for opioid use disorder (OUD), it remains underutilized. The ability to prescribe buprenorphine for OUD has recently been expanded beyond waived physicians to include waived nurse practitioners and physician assistants. Further efforts have included extending buprenorphine prescribing beyond specialty treatment settings into primary care. HRSA awarded a joint project between the School of Medicine and Betty Irene Moore School of Nursing at University of California, Davis a 5-year Primary Care Training Enhancement grant in 2016 to develop and test a community-based collaborative interprofessional primary care model, and in 2017 supplemental funding was added to include MAT-related training. This poster describes an educational needs assessment conducted among key informants to identify both faculty and community provider perceptions of learners' needs around MAT.

**Methods:** Using an iterative feedback process, the authors developed and piloted a semi-structured interview questionnaire. Five interviewers conducted interviews either over the phone or in person from October 2018–March 2019. Key informants represented two groups of health care providers at UC Davis: faculty and community partners. Interviewees were asked about either current student learners (medical, physician assistant and nursing students, pharmacy or medical residents) in the case of faculty. Community partners were asked about new graduates from these programs. Quantitative and qualitative data were collected and recorded in an online manager, Qualtrics. Analysis was completed utilizing Nvivo 12. One researcher independently coded the data, refining the codes using an iterative process in consultation with the larger group of 5 interviewers.

**Results:** A total of 24 interviews were conducted: 11 faculty, 11 community partners and 2 respondents who were both faculty & community partners. Most faculty (73%) and community partners (64%) saw students/recent graduates as unprepared or somewhat unprepared to work with patients with OUD. Based on rank ordering of priorities, faculty felt that students needed the most additional training in working with patients with prescription OUD, whereas community partners felt recent graduates needed the most additional training in working with patients who misuse prescription opioids but do not have OUD. Both groups identified motivational interviewing and related patient-prescriber communication skills as areas where additional training was needed. Both groups felt confident that additional training/education could be provided within their organizations, but both saw multiple barriers to doing so, particularly time limitations in busy schedules or full curricula. Both groups thought that interprofessional training in a workshop or simulation would be valuable.

**Conclusions:** The study highlighted that significant gaps in knowledge and skills to manage patients with OUD are perceived by both faculty and community partners and that neither group had current structures in place to provide this training. Based on these results, we further developed a 4-hour long interprofessional workshop on the assessment and treatment of opioid use disorder in the primary care setting. The workshop included a didactic session led by a topic expert, and a simulation in which groups of 2-3 learners worked with a faculty facilitator to assess, diagnose and treat a patient with opioid use disorder, played by a standardized patient. In total 83 learners and 18 faculty from nursing, medicine and pharmacy participated.

**Summary:** see "Conclusions" above.

**Funding Sources:** None



## NON-CME POSTERS

### Poster 74: Injectable weekly and monthly buprenorphine in the outpatient treatment of fentanyl users with OUD

**Natalie Budilovsky-Kelley**, *Braeburn*; **Edward Nunes, MD**, *Columbia University*; **Sandra Comer, PhD**, *Columbia University*; **Michelle Lofwall, MD**, *University of Kentucky Center for Drug and Alcohol*; **Sharon Walsh, PhD**, *University of Kentucky Center for Drug and Alcohol*; **Stefan Peterson, PhD**, *Camurus AB*; **Fedrik Tiberg, PhD**, *Camurus AB*; **Sonnie Kim, PharmD**, *Braeburn*

**Background:** The introduction of the very high potency opioid analgesic fentanyl into the illicit heroin supply in the U.S. has compounded the opioid epidemic. Clinical reports suggest substantial proportions of patients seeking treatment for opioid use disorder in some regions test positive for fentanyl. Fentanyl and its high potency analogs now account for a majority of overdose deaths, and for the rise in overdose deaths. Few clinical studies conducted to date have tested patients for fentanyl, and data on the effectiveness of buprenorphine (BPN) among fentanyl users is limited.

**Methods:** This 24-week, randomized, double-blind, double-dummy, active-controlled study, evaluated treatment with weekly and monthly injectable extended-release buprenorphine, CAM2038, compared to daily sublingual buprenorphine/naloxone (SL BPN/NX) for initiation and maintenance treatment of patients with opioid use disorder at 35 centers throughout the US. Urine toxicology was conducted using quantitative LC-MS/MS and GC-MS analytical techniques and included fentanyl and norfentanyl. Post-hoc analyses were conducted in the subgroup of participants with evidence of fentanyl use prior to randomization.

**Results:** Of the 428 randomized participants, a total of 111, 62 (29.1%) in the CAM2038 group and 49 (22.8%) in the SL BPN/NX group, demonstrated evidence of fentanyl use prior to randomization. Those with evidence of fentanyl use were primarily at sites in Ohio, Missouri, and Florida. Most participants in the fentanyl-positive group (83.8%) identified heroin as their primary opioid, compared to 66.2% in the fentanyl-negative group. There were no difference in intravenous route of use at baseline for both groups (54.1% vs 51.7% for fentanyl-positive and fentanyl-negative groups, respectively). At baseline, the fentanyl-positive group provided higher mean percentage of positive urine samples as compared to the fentanyl-negative group for cocaine (37.8% vs 20.2%) and benzodiazepines (21.6% vs 12.9%). Over the course of the study, mean percentage of opioid-negative urine toxicology results was ~10% higher for fentanyl-negative vs fentanyl-positive group. Within the fentanyl-positive group, mean opioid-negative urine toxicology results was higher for CAM2038 (29.6%) vs SL BPN/NX (20.0%), a difference of 9.6% (95% CI of -3.9%, 23.2%). For fentanyl-negative group, in both cohorts, opioid withdrawal (evaluated by COWS) and cravings (evaluated by Need-To-Use Visual Analog Scale [VAS]), were suppressed from day 1 and throughout the study, including during transitions from weekly to monthly injections, without significant group differences. For fentanyl-positive group, opioid withdrawal and

cravings were suppressed in both cohorts, however, COWS and VAS scores were lower for CAM2038 vs SL BPN/NX.

**Conclusions:** In this diverse sample of participants seeking treatment for OUD, the subgroup with exposure to fentanyl prior to randomization exhibited markers of greater severity of illness at baseline (more heroin use, more co-occurring non-opioid drug use) and fewer opioid negative urine results during treatment. Consistent with previous post-hoc analyses of subgroups reporting heroin or IV drug use at baseline, treatment with CAM2038 resulted in a greater percentage of urine samples negative for illicit opioids in participants with evidence of fentanyl use prior to randomization vs SL BPN/NX.

**Summary:** The long-acting weekly and monthly injectable BPN, CAM2038, may have an advantage over SL BPN/NX on illicit opioid use outcome among difficult-to-treat patient population, including those who test positive for fentanyl at treatment initiation. As these are post-hoc analyses from a randomized study, results should be interpreted with caution as further studies are needed to confirm the improved effectiveness of CAM2038 in these subgroups.

**Funding Sources:** Braeburn

## Poster 75: Relapse Rates After a Clinical Trial of Lofexidine for Opioid Withdrawal Syndrome

**Mark Pirner, MD, PhD, US WorldMeds, LLC; Thomas Clinch, BS, US WorldMeds, LLC; Thomas Kosten, MD, Baylor College of Medicine**

**Background:** Cessation of opioid misuse is a crucial first step in management of opioid use disorder (OUD); however, long-term abstinence is the ultimate treatment goal. Return to opioid use after initial opioid withdrawal is common with as many as 71% reporting relapse by 1 month and 91% within 1.5 to 3.5 years.<sup>(1)</sup> Completion of an initial treatment program is associated with a reduced risk for relapse.<sup>(1,2)</sup> Lofexidine is an alpha2-adrenergic agonist indicated for mitigation of opioid withdrawal symptoms to facilitate abrupt opioid discontinuation in adults. A recent clinical trial of lofexidine for treatment of opioid withdrawal symptoms collected data on relapse at a 30-day post-study safety follow-up.

**Methods:** This was a randomized, double-blind trial comparing lofexidine 2.16 mg/day (N=229) and 2.88 mg/day (N=222) to placebo (N=151) for 7-days of inpatient treatment followed by an optional 7 days (inpatient or outpatient) of open-label treatment with lofexidine. Subjects were  $\geq 18$  years old, met criteria for OUD and were abruptly withdrawing from short-acting opioids. Subjects were typically referred to community-based treatment programs at study discontinuation. Subjects were considered study completers if, on Day 7, they received at least 1 dose of study medication and completed the Short Opioid Withdrawal Scale of Gossop, the primary study outcome. Telephone follow-up was made 30 days from administration of the last dose of study medication for adverse event evaluation and current treatment status (including self-reported relapse). Descriptive statistics were calculated on relapse data.

**Results:** The majority of subjects were white, male and used heroin as their primary opioid. Ages ranged from 19 to 74 years with mean age  $35 \pm 11$  years. Study completion rates were significantly higher in the lofexidine groups: 41.5% for 2.16-mg ( $P = .007$ ) and 39.6% for 2.88-mg ( $P = .02$ ) vs 27.8% for placebo. Fifty-seven percent of all subjects (345/602) were contacted for 30-day follow-up: of the study completers, 69.8% (157/225) were contacted; of the study non-completers, 49.9% (188/377) were contacted. Of contacted study completers, 75% (118/157) reported no relapse; of contacted study non-completers, 30% (57/188) reported no relapse.

**Conclusions:** Completion of the 7-day treatment portion of the study was associated with a lower rate of self-reported relapse at a 30-day phone follow-up for safety. Although the study was not designed to assess post-withdrawal treatment status, these results complement findings that show completion of an initial treatment program is associated with a reduced risk for relapse.

**Summary:** Lofexidine is an alpha2-adrenergic agonist recently FDA-approved for treatment of opioid withdrawal symptoms. The proportion of subjects completing a 7-day opioid withdrawal study was greater with lofexidine versus placebo. Among all subjects who could be contacted 30 days post-trial, subjects who completed the study reported a lower rate of relapse than those who did not complete.

Treatment of opioid-dependent persons during the early period of opioid withdrawal may facilitate transition to long-term opioid use disorder management and reduce risk for relapse.

**Funding Sources:** US WorldMeds, LLC.

## Poster 76: Predictors of XR-NTX Initiation in Patients with Opioid Use Disorder: Integrated Database Findings

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**Background:** Naltrexone extended-release injectable suspension (XR-NTX), a  $\mu$ -opioid receptor antagonist administered monthly, is indicated for the prevention of relapse following opioid detoxification. Withdrawal management and initiation of treatment can be challenging for some patients. In this retrospective review of data, we used an integrated database of clinical trial data to identify baseline patient characteristics that were associated with receipt of an initial XR-NTX injection.

**Methods:** We conducted a retrospective review of clinical chart data from clinical trials (NCT00476242, NCT01024335, NCT01377610, NCT00577408, NCT02294253) that included individuals (N=388) with opioid use disorder who were treated for opioid withdrawal and received the initial XR-NTX injection (both inpatient and outpatient inductions). We tested for associations between successful induction onto XR-NTX (receipt of initial injection) and baseline variables, including demographic characteristics, substance use, and psychiatric comorbidity in bivariate and multivariable models. Missing baseline variable values were assumed missing at random and imputed by multiple imputation (sequential generalized regression) in the bivariate and multivariable analyses. All covariates in this study were used to impute missing data.

**Results:** An initial XR-NTX injection was received by 50.9% (n=200) of participants. Several baseline factors were significantly associated with receipt of an initial XR-NTX injection in the final multivariable model (estimated adjusted odds ratios (AOR) [95% CI] of receipt of first injection). For the duration of regular opioid use, 10-19 years was associated with a greater likelihood of receiving an XR-NTX injection compared with other durations of use (3-4 years / 5-9 years / 10-19 years / 20-46 years vs 1-2 years; AOR, 1.21 [0.60, 2.44] / 0.69 [0.33, 1.41] / 2.59 [1.19, 5.59] / 0.91 [0.40, 2.08], respectively). A greater likelihood of receiving an initial XR-NTX injection was associated with use of cocaine within the past 7 days (yes vs no; AOR 2.25 [1.16, 4.39]). A lower likelihood of receiving an initial XR-NTX injection was associated with an older age at first opioid use (20-29 years old / 30-54 years old vs 9-19 years old; AOR, 0.45 [0.26, 0.76] / 0.48 [0.25, 0.93], respectively) and heroin use (type of opioid used - heroin vs prescription; AOR, 0.47 [0.27, 0.84]). In a second multivariable model using route of opioid administration (instead of type of opioid used) the intravenous / intranasal routes were associated with lower likelihood of XR-NTX injection (intravenous / intranasal / smoked-or-missing vs oral; AOR, 0.34 [0.16, 0.72] / 0.50 [0.26, 0.96] / 0.86 [0.15, 5.02] respectively).

**Conclusions:** These findings suggest that duration of opioid use may be associated with a greater likelihood of successful XR-NTX induction and that co-occurring cocaine use did not negatively affect transition. Older age, heroin use (versus prescription), and intravenous or intranasal opioid administration (versus oral administration) may be associated with a lower likelihood of successful XR-

NTX induction. This finding is similar to that in previous studies that suggest that more severe OUD (represented by heroin use and intravenous or intranasal opioid administration) is associated with less successful transition onto XR-NTX. Additional support may be beneficial in this and other selected groups of patients when initiating treatment of opioid withdrawal followed by relapse prevention using XR-NTX.

**Summary:** This study identifies potential baseline demographic characteristics of patients with OUD that may be useful when assessing the need for individualized treatment during XR-NTX induction.

**Funding Sources:** Alkermes, Inc.

## Poster 77: Characteristics of Individuals Seeking to Transition from BUP to XR-NTX in a Randomized, Placebo-controlled Trial

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**Background:** For individuals with opioid use disorder (OUD), medication preference may change over time; however, only limited guidance is available to facilitate the transition between medication classes. A double-blind, randomized, placebo-controlled study evaluated induction regimens for individuals seeking to transition from buprenorphine (BUP) to naltrexone extended-release injectable suspension (XR-NTX); overall, 72.3% of participants successfully transitioned to XR-NTX. In this post hoc analysis, we describe the characteristics of participants in this study, including the reasons for seeking to transition from BUP to XR-NTX.

**Methods:** In this Phase 3, hybrid outpatient-residential, multicenter study (NCT02696434), participants (N=101) receiving BUP ( $\geq 3$  months) and seeking antagonist treatment with XR-NTX were randomized (1:1) to oral NTX+BUP or placebo-NTX+BUP for induction onto XR-NTX. In this post hoc analysis, we assessed baseline characteristics, treatment history of participants, self-reported reasons (by questionnaire) for seeking transition from BUP to XR-NTX, and self-reported awareness of XR-NTX as a treatment option.

**Results:** Participants were predominantly male (70.3%) and white (92.1%), with mean age of 35.6 years. At baseline, participants had a mean (standard deviation) Clinical Opiate Withdrawal Scale (COWS) score of 3.2 (2.73), Subjective Opiate Withdrawal Scale (SOWS) score of 6.0 (9.39), and visual analog scale (VAS) score for cravings of 10.5 (20.54; median 1.0). At screening, about one third of participants were positive by urine drug toxicology for cannabis (34.7%) or benzodiazepines (27.7%), and about one third of participants self-reported use of alcohol (26.7%). The most commonly used opioids prior to BUP treatment were intravenous heroin (30.7%), intranasal heroin (18.8%), and oxycodone (16.8%). Most participants (62.4%) had a history of opioid use for  $\geq 3$  years, and 42.6% had used opioids for  $> 5$  years, before their current course of BUP treatment. Of note, about half of participants (55.5%) reported being on their first course of BUP treatment; 60.4% entered the study on a daily dose of 8 mg BUP; and 39.6% were on a daily dose of  $< 8$  mg BUP. The most common reasons for wanting to transition from BUP to XR-NTX were 'seeking to be opioid-free' (63.4%), 'tired of daily pill-taking' (25.7%), and 'side effects from BUP' (5.9%, including 'sweats/chills', 'dizziness/lightheadedness', and 'drowsiness/sleepiness'). More than three quarters of participants (78.2%) stated that they were not aware of XR-NTX as a treatment option when they first initiated BUP treatment.

**Conclusions:** In this population of BUP-treated individuals seeking to transition to XR-NTX, approximately half were former heroin users, and the majority were white and male. For most participants the primary reason for transition from BUP to XR-NTX was 'seeking to be opioid-free'. Most participants reported that they were not aware of XR-NTX as a treatment option at the time of BUP treatment initiation.

**Summary:** The finding that, at BUP treatment initiation, most participants were not aware of the antagonist treatment option highlights the need for healthcare provider training to ensure that individuals are educated on all evidence-based treatment options for OUD, can provide fully informed consent, and participate in shared decision-making. Further, the current study highlights that treatment preferences may change over time, and some individuals in treatment for OUD may seek to transition from agonist to antagonist therapy.

**Funding Sources:** Alkermes, Inc.



## Poster 78: First-time User Experience and Engagement with Prescription Digital Therapeutics for Substance Use Disorders

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**Background:** Substance Use disorder (SUD), a chronic relapsing disease, affected nearly 20 million individuals in the U.S. in 2017.<sup>1</sup> SUD has devastating consequences, including a particularly high risk of lethal overdose. The rising trend in drug overdose deaths driven primarily by opioids is alarming, with more than 72,000 overdose deaths occurring in 2017.<sup>2</sup> Of individuals in need of substance use treatment less than 20% receive care<sup>3</sup>, and even those may not have access to evidence-based practices such as face-to-face cognitive behavioral therapy (CBT). Prescription Digital Therapeutics (PDTs) are a new class of therapeutic delivering evidence-based disease treatment via mobile devices. PDTs have great potential to enhance treatment outcomes and improve access to CBT. reSET® and reSET-O® are FDA market-authorized PDTs for SUD and Opioid Use Disorder (OUD), respectively. The mechanisms of action of reSET and reSET-O include Community Reinforcement Approach (an addiction-specific form of CBT focused primarily on building relapse prevention skills), fluency training, and contingency management.<sup>4</sup> Patient engagement and satisfaction with treatment correlate with positive outcomes such as improved treatment retention.<sup>5–9</sup> Thus, a study was conducted to evaluate early engagement and satisfaction with reSET and reSET-O.

**Methods:** This outpatient, open-label study conducted at Hassman Research Institute enrolled a total of 34 participants: 17 with SUD and 17 with OUD. All participants with OUD received buprenorphine Medication-Assisted Treatment. Participants received a prescription for reSET (90 days) or reSET-O (84 days) and were followed biweekly for therapist appointments and urine drug screens. Surveys and/or structured qualitative interviews were conducted at baseline (n=31), Week 4 (n=27) and Week 12 (n=26) to evaluate ease of installation, ease of use, user satisfaction, and motivation to use reSET and reSET-O. Participant responses to each interview question were recorded and analyzed for common themes. Engagement metrics (e.g. app usage) were quantified from weekly user activity logs to complement user survey and interview results.

**Results:** Participants reported high satisfaction with the onboarding process (installation and first time use of the PDTs): all participants rated installation as easy or very easy, and all participants were satisfied or very satisfied with installation. All participants were motivated or very motivated to use reSET and reSET-O at baseline. Continued engagement was observed across the 12-week treatment period with over 50% of participants using their assigned PDT at week 12. Participants reported that the therapeutic content was easy to understand, relevant and helpful: over 93% of reSET (n=15) and 100% of reSET-O (n=12) participants found the content as easy to understand, over 85% of reSET and 83% of reSET-O participants found the content relevant, and 100% of participants found the therapeutic content helpful. Interviews uncovered diverse patient values and motivations underlying participants' interest and engagement in the PDTs, ranging from the ability to access therapy outside of groups to the

utility of a PDT as a craving management tool. Nearly all (>85%) participants practiced skills learned from therapeutic lessons daily or weekly, a trend that remained consistent at week 12. Some participants (13% reSET; 41% reSET-O) reported difficulty incorporating reSET and reSET-O into their daily lives. This challenge was more apparent for participants who received reSET-O. Participant interviews revealed four key themes corresponding with survey data relevant to difficulty incorporating a PDT into daily life: participants reported problems with remembering to use their PDT, lack of time, distractions, and unplanned events as barriers to use. Participants who described incorporating reSET and reSET-O into their daily routines were generally more successful with using the PDTs in their daily lives.

**Conclusions:** The data presented here demonstrate high patient satisfaction with the reSET and reSET-O PDTs. Importantly, participants practiced skills daily or weekly, consistent with the intent of CRA to build skills that prevent relapse to substance use. Although engagement and satisfaction with the PDTs were high, some participants found it difficult to fit a PDT into daily life. Qualitative interviews revealed themes associated with varied experiences incorporating PDTs into daily life and the importance of anchoring use of a PDT to a daily routine for greater success. These data may support patient-provider discussions on strategies for successful integration of PDTs into a treatment plan to maximize patient benefit.

**Summary:** This open-labeled study evaluated early engagement and satisfaction with the reSET and reSET-O Prescription Digital Therapeutics. The findings demonstrate high patient satisfaction and may inform treatment providers on the benefits and potential strategies for successful integration of PDTs into a treatment plan to maximize patient benefit.

**Funding Sources:** Pear Therapeutics

## Poster 79: Proof-of-Concept Study of a Gamified Prescription Digital Therapeutic for Individuals with Opioid Use Disorder

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**Background:** The U.S. is in the midst of an opioid epidemic. Opioid overdose deaths have skyrocketed in the past decade, killing a record 47,000 people in 2017, an average of 130 people per day.[1] Medication-Assisted Treatment (MAT), the standard of care for Opioid Use Disorder (OUD), pairs FDA-approved pharmacotherapy such as buprenorphine with behavioral interventions. Although buprenorphine MAT improves patient outcomes[2], [3] treatment attrition remains a major challenge. Patient engagement and satisfaction with treatment improve treatment retention and clinical outcomes. One approach to improving treatment engagement and patient outcomes is to leverage digital technology (e.g. Prescription Digital Therapeutics or PDTs). PDTs are FDA market-authorized software that treats disease. reSET-O®, a PDT for patients with OUD, delivers addiction-specific behavioral therapy based on the Community Reinforcement Approach (CRA) and improves buprenorphine treatment outcomes.[4], [5] While effective, reSET-O utilizes didactic methods to deliver therapeutic content (i.e. narrated text, video scenarios and worksheets). We hypothesize that a more interactive method of therapeutic content delivery using gamification techniques may improve patient satisfaction with treatment.

**Methods:** A proof-of-concept study was conducted to evaluate whether a more engaging method of delivering validated therapeutic content enhanced usability and patient satisfaction with a PDT. A prototype consisting of a single reSET-O therapeutic module was developed and evaluated by 8 individuals with OUD. Prototype game mechanics were modeled on existing knowledge-based games that emphasize memory retention and retrieval. This approach was used because the therapeutic content focuses on building skills that patients can implement to support behavior change. Key CRA concepts within the module were separated into digestible sequences of text focused on small, achievable goals to drive motivation and engagement. Virtual rewards earned via progression through the module were added to provide positive reinforcement for continued participation. Participants evaluated both the original module version and the gamified prototype. Surveys and focus groups were conducted to assess satisfaction, appeal, and intention to use the PDT in the future.

**Results:** Survey results showed that 100% of participants preferred the gamified prototype. Participants reported acceptable ease of use for both module versions, with 75% rating the gamified prototype as very easy/easy to navigate compared to 63% for the current version. Patients were more satisfied with the gamified prototype (88%) compared to the original version satisfaction (50%) and significantly more patients reported the gamified version as appealing ( $\chi^2 = 4.4$ ,  $p = 0.035$ ). Although not statistically significant, due to lack of statistical power, there was a 66% increase in future use of the gamified version compared to the original version.

**Conclusions:** These data demonstrate feasibility and patient preference of the gamified presentation of therapeutic content. Future efforts will focus on continued gamification of this PDT using iterative patient feedback to guide development followed by evaluation of the gamified PDT in a randomized, controlled trial.

**Summary:** The results of this feasibility study support the hypothesis that leveraging techniques like gamification to deliver therapeutic content in a more engaging way enhances patient satisfaction.

**Funding Sources:** Pear Therapeutics