TRUST

Treatment *for Individuals who* **U**se **St**imulants

A Protocol Using Empirically-Supported Behavioral Treatments for People with Stimulant Use Disorders

Version Date: March 15, 2021

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Introduction

Over the past 30 years there has been extensive research done on the development of treatments for individuals with Stimulant Use Disorder (StimUD). There has been considerable evidence compiled about what "works" and what does not. Currently there are no medications approved by the FDA for StimUD treatment. However, there are several behavioral strategies that do have evidence of efficacy in assisting individuals to reduce and/or discontinue their stimulant use. These approaches include contingency management, cognitive behavioral therapy, community reinforcement approach, motivational interviewing and physical exercise.

The extent to which these strategies with supportive evidence are currently being used in real world treatment programs varies greatly from state to state, from program to program. This is unfortunate as there is clear evidence that use of stimulants (cocaine and methamphetamine) is increasing and becoming more deadly. To provide individuals with the best chance of effectively addressing their stimulant problem, the use of approaches supported by research is highly recommended.

Purpose of this Manual

The authors of this manual have been involved in research, treatment, and training efforts on stimulant use disorder for over 30 years. Over this period, the research on stimulant use disorder and its treatment has vastly increased and there is a great interest to better understand StimUD and provide effective treatment for people who use cocaine and methamphetamine.

We have produced this manual to promote the use of research-supported strategies for StimUD treatment. The manual attempts to combine a number of strategies into a framework that is appropriate for use by clinicians in settings where people with StimUD receive treatment. This manual does not intend to be a cookbook and the materials used and the framework for their use are not intended to be an inflexible, one-size-fits-all prescription. At the end of the manual, we list a variety of treatment materials (see appendix) that can be added or substituted for the ones we are recommending. We provide the contents of this manual and the framework

for combining these treatment materials as one example for how research supported strategies can be combined into a structured treatment experience.

The audience for the manual includes healthcare professionals who provide treatment services for individuals with StimUD. One category of these professionals who we particularly hope will benefit are therapists and other behavioral health clinicians who work in substance use disorder specialty care treatment programs. The manual has been written with this group in mind.

The manual intends to:

1. Provide new information about the use and effects of cocaine and methamphetamine.
2. Present some the key clinical challenges that clinicians face when treating this population.
3. Review the evidence-based treatment strategies for StimUD treatment.
4. Discuss how motivational interviewing (MI) is central to the effective engagement of individuals in treatment and to assisting them with behavior change during treatment.
5. Present how elements of community reinforcement approach (CRA) and cognitive behavioral therapy (CBT) can be used to assist individuals with StimUD to reduce/discontinue their drug use and prevent relapse.
6. Describe a procedure for incorporating positive incentives into the treatment milieu.
7. Provide information and guidance for how physical exercise can benefit individuals who are attempting to reduce/discontinue their use of methamphetamine and cocaine.
8. Describe a plan for providing continuing care to assist individuals to sustain the progress they have made in a structured treatment program.
9. List an array of manuals and training resources for other research supported substance use disorder treatment approaches.

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Acknowledgements
The authors would like to acknowledge the assistance provided by Thomas Freese, PhD, Gloria Miele, PhD. and Valerie P Antonini, MPH. Christine Morgan has provided invaluable support with the production of the manual along with additional help from Benjamin Nguyen, MSW, CPH.

The materials in this manual include content and worksheets from the Matrix Model Therapist Manual (SAMHSA, 2006); from the Community Reinforcement Approach, plus Vouchers Manual (NIDA, 2020).

Person-first Language

Throughout this document we make a concerted effort to use person-first and gender-neutral language. Person-first language refers to individuals who use drugs/alcohol and/or are in treatment for substance use disorder (eg. “Individuals who use cocaine or methamphetamine”), rather than using more stigmatizing terms (eg. “addict” or “cocaine/methamphetamine users”).

We also make an effort to use inclusive, gender-neutral language and choose to use “they” instead of he or she as a singular pronoun.

Because old habits are difficult to change, we may have inadvertently used the older and more stigmatizing terminology at some points in the document. We apologize for these oversights and encourage those using this manual to join us in the effort to use person-first and gender-neutral adaptations to their language as well.

Chapter 1: Background

Introduction

The group of drugs classified as psychomotor stimulants: methamphetamine, cocaine and prescription stimulants, including methylphenidate (Ritalin, Concerta), amphetamines (Adderall, Vyvance) are widely used in the US with considerable geographic variation in which of the stimulant drugs is used in which part of the US. Methamphetamine and cocaine are currently the most widely available stimulants and are the focus of this manual. However, there are reports about increasing misuse of prescription stimulants in some geographical areas. The content of this document may be useful in addressing the needs of individuals who are misusing prescription stimulants.

The increase in stimulant use and dependence beginning in the middle of the 2010-2020 decade and continuing, is being referred to by some federal officials as "the 4th wave" of the opioid epidemic. Increasing amounts of the cocaine and methamphetamine produced by drug cartels and transported into the US, now contain varying amounts of the very potent opioid, fentanyl. Price for these drugs has gone down and availability, purity and potency has gone up in much of the US, to the point where in many (most?) parts of the US, some form of psychomotor stimulant is widely available and much of the stimulant product sold on the street includes fentanyl. In large part, the addition of fentanyl to cocaine and methamphetamine supplies has resulted in dramatically increased rates of overdose and overdose deaths associated with cocaine and methamphetamine use.

Acute and Chronic Health Effects of Stimulant Use and Dependence

The acute effects of stimulant use include euphoria, increased talkativeness, hyperactivity, erratic changes in mood, increased blood pressure, elevated body temperature, and rapid heart and breathing rates. Other acute symptoms include reduced fatigue, reduced hunger, increased energy, increased sexual drive, and increased self-confidence. Heavy and long-term chronic stimulant use is frequently associated with psychosis, paranoia, symptoms of anxiety and depression, social withdrawal, emotional volatility, and violence.

Medical Consequences of Stimulant Use

Cocaine and methamphetamine use is known to be associated with acute and chronic medical conditions affecting multiple organ systems. The most common symptoms among patients presenting in medical settings are acute stimulant intoxication, psychosis, stroke, agitation, suicidality, cardiovascular abnormalities, dermatologic issues, dental disease and non-responsiveness due to tonic-clonic seizure activity. Use of stimulants by pregnant women can result in dangers to the woman, to the fetus and to child development problems.

Overdose risk

Acute stimulant toxicity has also been associated with fatalities resulting from drug-induced seizures, hyperthermia, hypoxic stress, and cardiovascular complications. A large amount of the methamphetamine and cocaine that is trafficked into the United States and sold on the streets in 2021 contains unpredictable levels of fentanyl. The use of these combination stimulant-fentanyl products creates a very high risk for overdose/overdose death, since fentanyl is a very potent opioid that suppresses respiration, and the individual has no way of knowing how much fentanyl is in the street drug product sold as methamphetamine or cocaine. Many individuals who use cocaine and methamphetamine do not have high tolerance for opioids, and they may not be aware of the overdose risk posed by fentanyl.

During initial contacts with treatment-seeking individuals who use stimulants, it is important to assess their awareness of the dangers from fentanyl and educate them about these risks. Individuals who use by injection are at greatest risk for overdose and overdose death. Individuals who are using by injection and have experienced overdose are good candidates to be given naloxone (Narcan) overdose reversal tools and instructions on their use. Having staff who are knowledgeable and conversant in the dangers of meth/fentanyl overdose and able to fully inform patients about risks and use of naloxone for overdose is critical.

Cardiovascular Effects

Cardiopulmonary consequences are common among individuals who use stimulants. Chest pain, hypertension, shortness of breath, and tachycardia are common in ER cases. Also seen in ERs is acute coronary syndrome (ACS), which has been documented in 25% of cases in individuals who misuse methamphetamine admitted for chest pain, resulting from myocardial ischemia (reduced blood flow to the heart), with increased risk of arrhythmias and cardiogenic shock (inability of the heart to pump sufficient blood, usually after a severe heart attack). Cardiomyopathy related to stimulant use may be reversible with cessation of drug use. Pulmonary edema (fluid in the lungs) was found in over 70% of methamphetamine-related deaths, as well as pulmonary hypertension.

Effects on Teeth and Skin

Dental disease ("meth mouth") and other oral complications are common among individuals who use methamphetamine chronically. Oral health problems most often seen include rampant cavities, tooth fracture, and periodontal disease (e.g., gingivitis, periodontitis). In addition to cavities and gingivitis, individuals who use methamphetamine often present with tooth wear and temporomandibular joint (TMJ) syndrome related to bruxism (teeth grinding), which may be a reaction to anxiety and restlessness, especially during early abstinence. Skin excoriations (sores caused from picking) or cutaneous ulcers are common among individuals who use stimulants, arising in response to reported sensation of bugs crawling below the skin. In addition, cellulitis and abscesses resulting from injection of stimulants are also frequently reported.

Pulmonary problems

Many individuals who use cocaine and meth "smoke" their drugs (commonly referred to as "crack" or "ice/crystal" for cocaine and methamphetamine, respectively) and consequently their use has profound impact on their lungs. Problems include pulmonary edema, dyspnea (difficult or painful breathing), bronchitis, pulmonary hypertension, hemoptysis (coughing up blood), chest pain, asthma exacerbation, and pulmonary granuloma (inflammation or nodules form due to infections). High concentrations of methamphetamine in the lungs has been found, with 30% greater concentrations in African American than in white

individuals who use methamphetamine. Tuberculosis is common among individuals who use methamphetamine.

Neurologic/Psychiatric problems

Neurologic problems include strokes, seizures, chronic headache, cerebral swelling and hemorrhage, involuntary movements, and tics. All routes of administration have been associated with strokes and seizures, producing long-term neuronal damage. Many individuals who use stimulants suffer from neurocognitive impairments and psychiatric co-morbidity, including severe psychosis, depression, and suicidal ideation. As a result of the disruption to cognitive functioning and other neurologic symptoms, individuals who have been using stimulants chronically are said to have an altered brain state is consistent with degenerative central nervous system diseases

Acute Clinical Presentation and Management of Stimulant Use Disorder

Intoxication and overdose

Ingestion of cocaine and methamphetamine causes a surge in catecholamines in the central nervous system. A potent release of dopamine and norepinephrine leads to euphoria, hyperexcitability, hypersexuality, increased locomotor activity, agitation, and psychotic symptoms, including paranoia and hallucinations. Acute agitation from cocaine/methamphetamine intoxication is most often the condition that leads individuals who use stimulants to seek medical attention. "Talking down" the patient in a calm environment is the first course of action. Toxicity from injection or smoked routes of administration may necessitate the use of charcoal and medications such as ammonium chloride to hasten clearance from the gastrointestinal tract and the circulatory system.

Those individuals who exhibit severe symptoms of intoxication may require medication, including short-term benzodiazepine use. Benzodiazepines may be effective in acute management of agitation and distress and may reduce seizure potential in patients, particularly with cocaine toxicity. Due to cocaine's shorter duration of action, cocaine intoxication generally resolves more rapidly (2–4

hours) than methamphetamine intoxication, which can last up to 12 hours or longer.

Overdose from cocaine and methamphetamine can be fatal. The primary dangers are heart attack, stroke and very high body temperatures (105 and above). For high temperatures, it is imperative to reduce the temperature rapidly with ice packs and ice blankets. No medications are available to reverse methamphetamine overdose. However, as discussed above, patients exhibiting opioid overdose symptoms from fentanyl (or heroin) mixed with methamphetamine or cocaine, should be monitored closely for problems with breathing. Emergency services should be called if an overdose is suspected (either stimulant or opioid or both).

Acute Stimulant-induced Psychosis

Cocaine and methamphetamine-induced psychoses are similar; although more common among individuals who use methamphetamine and the severity and duration is often greater with methamphetamine use. With individuals who use stimulants chronically, psychosis can be triggered with even small doses of cocaine or methamphetamine. The psychotic symptoms frequently include auditory hallucinations (most common) and visual phenomena (flashing lights, seeing threatening strangers/police). In addition, powerful paranoia and persecutory delusions are extremely common. Individuals in a stimulant-induced psychotic condition have an increased potential for violence, and caution should be used in interacting with these patients.

Stimulant-induced psychosis is generally transient, and management of patients with psychosis, may require use of either a benzodiazepine or an antipsychotic, both of which should be discontinued when acute symptoms have resolved. Agents such as risperidone and olanzapine are less likely to cause extrapyramidal symptoms compared to first generation agents, and their sedative properties may ameliorate psychomotor agitation. It is, however, important to monitor for hyperthermia and dehydration when antipsychotics are used in patients with acute stimulant intoxication.

Chronic Stimulant-induced Psychosis

Persistent symptoms of psychosis are rarely reported among individuals who use cocaine, in the absence of other co-morbid psychiatric disorders. However, symptoms of persistent or chronic methamphetamine psychosis are often so similar to those of schizophrenia that some clinicians may regard them as clinically equivalent conditions, although it has been argued that methamphetamine *produces* a persistent psychosis that resembles schizophrenia. Regardless of the causal direction or association, the symptoms of schizophrenia and of persistent methamphetamine psychosis are not readily distinguishable, and the treatment for these conditions is basically the same.

Stimulant Withdrawal

Stimulant withdrawal symptoms consist of severe fatigue, cognitive impairment, feelings of depression and anxiety, anergia, confusion, and paranoia. For most patients experiencing acute withdrawal/early-phase abstinence, most symptoms resolve within 2 to 10 days. Rest, mild/moderate exercise, and a healthy diet may be the best management approach for most people in withdrawal. Those with heightened agitation and sleep disturbance may respond to benzodiazepines for a brief period, but acute depression and anhedonia associated with early abstinence generally resolve without intervention. Again, clinicians should be aware of possible dehydration and hyperthermia.

Challenges in Treating Individuals with Stimulant Use Disorder

Stimulant use disorder, like other substance use disorders is marked by loss of control over stimulant use despite consequences caused by use. Per the *DSM-5* (American Psychiatric Association, 2013), substance use disorders are diagnosed using 11 criteria including:

1) difficulty cutting down or stopping use,

2) excess time spent obtaining, using, or recovering from use,

3) use in excess of what was intended,

4) cravings,

5) tolerance,

6) withdrawal,

7) failed role obligations,

8) recurrent use in physically hazardous situations,

9) activities given up because of use,

10) use despite social or interpersonal problems, and

11) use despite psychological or medical consequences

The severity of use disorder is characterized by the number of criteria met over the previous 12 months: mild (2–3), moderate (4–5), or severe (6 or more).

Common clinical challenges when treating individuals who use stimulants

Anhedonia.

Anhedonia (the inability to feel pleasure) has been recognized as a component of the withdrawal syndrome for many drugs/alcohol. However, this symptom is particularly robust and clinically challenging for many individuals as they attempt to reduce or abstain from stimulant use. For many individuals who use stimulants in their early months of abstinence from cocaine/methamphetamine, anhedonia, together with symptoms of anxiety and depression are important factors in relapse. There is some evidence that exercise may reduce some of the severity of these symptoms.

Pavlovian Cues and Craving.

Although not unique to stimulants, individuals who use cocaine and methamphetamine develop a powerful Pavlovian craving response that is "triggered" when they come into contact with cues previously associated with stimulant use (cue-induced craving). These cues or "triggers" can include objects (e.g., cash), people (e.g., friends who use drugs), other substances (e.g., alcohol), places (e.g., areas where stimulants are sold or used), time periods (e.g., weekends,

after work) and emotional states (e.g., depression, boredom). This powerful craving response frequently plays a key role in return to drug use. It is important to educate individuals in treatment about the powerful impact of cue-induced craving and strategies for avoiding situations in which "triggers" are experienced, and to develop skills to manage cravings when triggered.

Stimulants and Violence.

There is a dose related relationship between the amount of methamphetamine used and incidents of violence. While those individuals who became psychotic had higher rates of violence, even without psychosis, those who use higher doses of meth had more involvement with violence during the period of their meth use. Co-occurring alcohol use also increased the association between meth use and violence. Clinicians working with individuals who use methamphetamine need to be aware of the relationship between meth use and violence and be cognizant of the consequences of violence on individuals who use methamphetamine and their families.

Hypersexuality and Sexual Dysfunction.

A related aspect of this Pavlovian response concerns the relationship between stimulant use and sexual behavior. Previous research has demonstrated that individuals who use cocaine and methamphetamine frequently combine their drug use with sexual activity. During treatment, hypersexuality may continue and can be associated with a return to drug use and for some, in the early months of reduced use/abstinence, sexual functioning may be impaired, causing psychological distress. Educating patients about the possibility of changes in sexual function during early recovery can help reduce their anxiety if these symptoms are experienced.

Cognitive Deficits.

There has been extensive research on the impact of stimulants (especially methamphetamine) on cognition. A variety of cognitive deficits, including attention and memory problems, have been documented during early weeks and months of abstinence and can be severe enough to interfere with functioning.

These cognitive difficulties can make treatment approaches that involve learning and remembering new information somewhat challenging. Clinical efforts should inform individuals in treatment about these cognitive deficits and in delivering treatment, use strategies that provide some repetition of information and do not depend on optimal memory.

Poor Retention in Treatment.

Poor engagement and retention of individuals who use stimulants in treatment is a frequent challenge. This retention problem is a major challenge to a positive treatment outcome as there is a well-established relationship between retention in treatment with individuals who use stimulants and positive outcomes. Selecting treatment strategies that promote retention in treatment is essential to have positive impact from stimulant treatment efforts

Methamphetamine Populations with Unique Clinical Concerns

Several groups present some unique challenges in treatment settings.

People Who Inject and People Who are Heavy Daily Users

Injecting stimulants and heavy daily use appears to lead to a more difficult clinical disorder. Individuals who inject stimulants tend to report far more severe craving during their recovery and higher rates of depression and other psychological symptoms before, during, and after treatment. Individuals who inject stimulants and who are heavy daily users also have higher dropout rates and exhibit higher rates of stimulant use during treatment. In a sample of individuals who are dependent on methamphetamine who entered treatment in the Midwest, Hawaii, or California, the rate of hepatitis C infection was 15%. Of the individuals who inject methamphetamine, over 45% were positive for hepatitis C. Clearly, preventive efforts that address behaviors that expose individuals to hepatitis C infection (blood-to-blood transfers or sharing drug paraphernalia) should be incorporated into treatment protocols.

Men who have sex with men (MSM)

Use of stimulants (particularly methamphetamine) by MSM is a significant public health problem. Elevated rates of methamphetamine use and associated high-risk sexual behavior have been reported in many MSM communities throughout the United States. Rates of HIV seroprevalence have been reported to be threefold higher among MSM who use methamphetamine- than among MSMs who do not use methamphetamine. A report by the U.S. Centers for Disease Control and Prevention on the connection between methamphetamine use, high-risk sexual behavior, and HIV transmission in MSM communities suggests that this combination of factors poses a major threat of high rates of HIV infection among MSM.

Women

Women use stimulants at rates approaching those of men. Women are more likely than men to be attracted to methamphetamine for weight loss and to control symptoms of depression. Over 70% of methamphetamine-dependent women report histories of physical and sexual abuse, and women are more likely than men to present for treatment with greater psychological distress. Many women with children do not seek treatment or they drop out early for fear of losing custody of their children, if reported to authorities for child abuse or neglect.

Children and perinatal issues

The effects of stimulant use by pregnant women include growth retardation, premature birth and, possibly, neurological disorders among their children. Children of methamphetamine-using parents also are at high risk of negligence and abuse because of the parents' drug preoccupation, erratic behavior, and psychiatric instability.

Adolescents

In communities where stimulant-use levels are high, adolescents who use methamphetamine have been seen in treatment centers in significant numbers. Of note is the extremely high rate of methamphetamine use among teen girls admitted

for substance use disorder treatment. One study found that 63.7% of adolescent females seeking treatment reported methamphetamine as their primary drug of choice. Methamphetamine use among adolescents has been shown to be associated with higher levels of emotional, psychiatric, and delinquency problems, compared with adolescents with other drug use diagnoses.

Treatment Approaches for Individuals with Stimulant Use Disorder

Medication treatments

After 30 years of intensive effort, there are no FDA approved medications for treating individuals with stimulant use disorders. The use of any pharmacotherapy to target stimulant use disorders is considered off-label at this time. Limitations of many of the existing clinical trials include limited power, methodological deficiencies, poor medication compliance, and high attrition rates.

Recently published studies provide some promising results in support of mirtazepine and bupropion plus extended-release naltrexone for the treatment of methamphetamine use disorder. Additionally, some evidence does exist for bupropion and naltrexone alone, as well as topiramate and sustained release methylphenidate for methamphetamine use disorder. For cocaine use disorder, topiramate, bupropion, modafinil, sustained release mixed amphetamine salts, disulfiram, and naltrexone/buprenorphine have supportive research.

Behavioral Approaches

Behavioral interventions are the mainstay of stimulant use disorder treatment. Several studies have examined the same research trials, clinical applications, protocols, and measures with individuals who use cocaine and methamphetamine. In all these studies, treatment response of individuals who use cocaine and methamphetamine has been comparable. For this reason, unlike the previous review of medications, we will review the evidence for the following behavioral strategies with the assumption that results from individuals who use cocaine will generalize to the population of individuals who use methamphetamine and vice

versa. The approaches with the most substantial evidence will be reviewed in some detail, followed by those with less, but some supportive evidence.

Behavioral approaches with robust empirical support

Contingency Management (CM)

During the past decade there have been a number of systematic reviews of treatments for stimulant use disorders, including two Cochrane Reviews, a review by the World Health Organization (WHO) for their Mental Health Guidelines document (MH-GAP, WHO), a meta-analysis by De Crescenzo et al. (2018) and two systematic reviews (Farrell et al., 2019; AshRani et al., 2020). In all these analyses, contingency management is recognized as having the strongest evidence of support. For example, in the Knapp et al. (2007) review, the following conclusion is reached from the analysis: "The comparisons between different types of behavioral interventions showed results in favor of treatments with some form of contingency management in respect to both reducing dropouts and lowering cocaine use." Further, the 2018 meta-analysis also concludes that contingency management (together with the community reinforcement approach) produces the best evidence of effectiveness for generating a variety of positive outcomes.

Contingency management (also known as motivational incentives) applies the principles of positive reinforcement for performance of desired "target" behaviors consistent with abstinence from cocaine or methamphetamine. CM involves the contingent delivery of an incentive for behaviors such as attendance at treatment sessions, a drug-negative urine specimen, or documented completion of a homework assignment. Incentives include privileges or desired items, such as vouchers. There are a variety of ways to structure and individualize CM, and a variable schedule of reinforcement can be applied, using the "fishbowl approach," which uses low-cost incentives. As the target behaviors are performed consistently over time, the value of the reward escalates. Failure to perform the target behavior can result in a "reset" of the reward value to a lower amount. This relatively simple, positive reinforcement procedure has been shown to produce and sustain substantial and clinically meaningful reductions in stimulant use.

Some of the specific research findings supporting contingency management for StimUD treatment include the landmark paper by Higgins et al. (1991) that documented highly significant reductions in cocaine use and very large and

significant increases in extended periods of cocaine abstinence using CM. Roll et al., 2006, extended these findings to individuals who use methamphetamine and reported that CM produced significantly greater retention in treatment and significantly more methamphetamine-negative urine samples. Rawson et al. (2002) found that with individuals in methadone treatment who also used cocaine, CM produced significantly more cocaine-free UAs when compared to no treatment (other than methadone) or cognitive behavioral therapy (CBT). Further, the addition of CBT did not produce additional benefits over and above CM alone.

Despite the strong empirical support for CM, its application in real world treatment settings has been limited, even though NIDA and SAMHSA have joined to produce a set of "Blending" manuals and materials to support the use of CM (https://www.drugabuse.gov/blending-initiative/motivational-incentives-package). Roll et al. (2009) described some of the obstacles that interfere with broad scale application of CM in community treatments. One effort that has shown promise is a large implementation trial promoting the use of CM as a routine treatment approach within United States Department of Veterans Affairs (VA). The effectiveness of this implementation project has been documented by DePhilippis et al., 2018, who reported that CM is being successfully implemented across a large number of VA sites and that patient outcomes were significantly improved by the addition of CM within these treatment settings.

Community Reinforcement Approach (CRA)

The Community Reinforcement Approach (CRA) is a combination of behavioral strategies that address the role of environmental contingencies in encouraging or discouraging drug use and attempts to rearrange these contingencies so that a non-drug using lifestyle is more rewarding than a using one. CRA components include behavioral skills training, social and recreational counseling, marital therapy, motivational enhancement, job counseling, and relapse prevention. In a number of CRA trials for cocaine use disorder, a voucher-based CM reinforcement program was added. Higgins et al. (1991) established the efficacy of CRA and vouchers (CM) for cocaine dependence treatment. To isolate the effects of CRA, Higgins et al. (2003) replicated this study, comparing CRA with vouchers versus vouchers only. Study results demonstrated that while both conditions produced significant reductions in cocaine use, participants in the CRA-plus-vouchers condition were better retained in treatment and had fewer days of cocaine or alcohol use. Further, those treated with CRA plus vouchers had more employed days, fewer hospital

admissions and legal problems, and reduced symptoms of depression. A systematic review of CRA concludes that CRA has evidence of support for reducing cocaine use, and CRA together with CM produced higher rates of abstinence than CRA alone. To promote the dissemination of CRA plus CM, NIDA has produced a manual describing the approach in detail.

Cognitive Behavioral Therapy (CBT)

Cognitive behavior therapy (CBT) is a form of "talk therapy" based on principles of social learning theory that is used to teach, encourage, and support individuals in reducing or stopping their harmful drug use. CBT provides training and practice in skills that are valuable in assisting people to gain initial abstinence from drugs (or in reducing their drug use) and provides skills to help people sustain abstinence. CBT addresses negative thought patterns and teaches individuals how to cope with distress to prevent relapse. A systematic review highlighting randomized control trials using CBT as an intervention for individuals who use methamphetamine reported that CBT was associated with reduced stimulant use and facilitated improvements in mood and other areas of functioning (ref), and a review of CBT for a variety of substance use disorders concludes that it is an effective approach (ref). Carroll and colleagues have conducted studies establishing the efficacy of cognitive behavioral therapy (CBT) for cocaine use disorder treatment. These studies demonstrated that the use of their CBT manual reduced cocaine use over a 1-year period. In fact, their report suggests that CBT produces especially efficacious results at follow-up points. In a meta-analysis of behavioral treatments for cocaine and methamphetamine use disorders, studies evaluating efficacy of CBT consistently reflect positive findings. However, data in this meta-analysis indicated that in numerous comparative trials in which CBT is compared to CM, CM strategies consistently result in greater reductions in stimulant use.

Recently, CBT has become more accessible through computerized delivery. In a randomized trial for cocaine-using individuals in methadone maintenance treatment, results showed that participants receiving computer-based training for cognitive-behavioral training ("CBT4CBT") were significantly more likely to have 3 or more consecutive weeks of abstinence from cocaine compared to controls.

Behavioral approaches with supportive evidence

The following behavioral strategies have been the subject of at least one randomized clinical trial demonstrating superior outcomes when compared to control procedures.

Exercise Therapy

Exercise is a simple and effective intervention for substance use disorders. By increasing endogenous opioid release, exercise helps potentiate dopamine efflux, improves mood and cognition, and can help prevent relapse. A recent 8-week trial (ref) showed that participants who use methamphetamine randomized to a supervised, progressive endurance and resistance training three times per week demonstrated improved dopamine receptor binding compared to individuals receiving health education only. In addition, the participants who received the exercise intervention had lower anxiety and depression scores over the study period, and individuals with lower severity methamphetamine use at baseline had significantly lower relapse rates after discharge from residential care. A large, randomized control trial funded by the National Institute on Drug Abuse also explored the relationship between stimulant use and exercise in residential programs. This study found a modestly significant higher percentage of days abstinent for participants receiving exercise who were adherent to their regimens, compared to those only receiving health education.

Mindfulness

Mindfulness is a practice derived from Buddhist teachings that centers on a conscious presence in the here and now with focused attention and nonjudgmental monitoring. Positive effects with regard to stress and cue reactivity in individuals with alcohol and/or cocaine use disorders receiving mindfulness compared to CBT have been reported. A systematic review of the literature (ref) recently concluded that mindfulness behavioral interventions could reduce consumption of cocaine and amphetamines to a greater extent than controls. Recently, a small pilot trial of a 10-week mindfulness therapy found that abstinence rates in participants who use cocaine who received mindfulness were greater than those of historical comparison groups.

Transcranial Magnetic Stimulation (TMS)

Transcranial magnetic stimulation is FDA approved for treatment resistant depression and has demonstrated preliminary evidence of potential efficacy for stimulant use disorder. A pilot trial that randomized participants with cocaine use disorder to receive repetitive TMS (rTMS) on the left dorsolateral prefrontal cortex (DLPFC) found a significant reduction in craving and cocaine positive urine tests in the rTMS group compared to the control. Similarly, it was shown that five sessions of rTMS on the left DLPFC significantly reduced cravings in patients with methamphetamine use disorder, while improving cognitive function. A subsequent study confirmed that cue-induced cravings for methamphetamine were diminished by rTMS of the dorsolateral prefrontal cortex, irrespective of side or frequency. This non-invasive treatment modality has limited side effects and may represent a unique way to target disordered stimulant use going forward.

Matrix Model

The Matrix Model of Intensive Outpatient Treatment is a combination of therapeutic strategies, including CBT, motivational interviewing, family involvement, and psychoeducation combined in a manner to produce an integrated outpatient treatment experience. In a large, multisite randomized trial comparing the Matrix Model to treatment as usual, individuals who use methamphetamine were retained in treatment longer, provided more methamphetamine negative urines, and had longer periods of abstinence than controls.

Motivational Interviewing (MI)

Motivational interviewing is a technique that aims to help individuals resolve their ambivalence about affecting positive change. In a recent randomized clinical trial, motivational interviewing demonstrated positive benefit with decreased methamphetamine use and lower cravings in participants receiving MI, regardless of intensity. Of note, intensive MI lasting 9 weeks was found to be especially impactful for women with methamphetamine use disorder and comorbid alcohol use. Another randomized trial examining MI for cocaine use found those

individuals who used cocaine on 15 or more of the 30 days prior to baseline had a significantly higher mean reduction in days of cocaine use following MI.

Twelve-Step Facilitation

Twelve-step facilitation is a therapy that is founded on the principles of Alcoholics Anonymous and traditionally comprises non-directed participation in meetings, fellowship, and attainment of a sponsor for guidance in recovery from substance use. A large multisite randomized trial sponsored by the National Institute on Drug Abuse demonstrated evidence that participation in 12-step therapy resulted in significant decreases in reported stimulant use and cravings and led to prosocial service engagement. Additionally, a secondary analysis suggested that having a sponsor was associated with a higher likelihood of sustained abstinence from stimulants at follow-up.

Chapter 2: Therapist Orientation

There have been a number of recent systematic reviews and meta-analyses of the evidence-based approaches for StimUD treatment. Although these reviews have some different emphasis, there is universal support for contingency management (CM) and good support for cognitive behavioral therapy (CBT), community reinforcement approach (CRA), motivational interviewing (MI) and physical exercise. As treatment organizations attempt to apply evidence-based practices (EBPs) to address the treatment needs of their patients with StimUD, it can be challenging to decide if one of these EBPs should be provided alone or together with other EBPs. This manual presents a framework and content for how these EBPs can be combined into a 12-week protocol, followed by an ongoing continuing care support program.

The manual is developed to give clinicians some suggestions for how these techniques can be integrated to address the needs of individuals with StimUD. There is an appendix at the end of the manual with a list of other manuals and materials with a varied amount of empirical support which may be of value in treating this patient population. For treatment organizations that use the TRUST protocol as a core for an intensive outpatient level of care (ASAM level 2.1 and above), we recommend that materials from the appendix be considered as additional treatment materials.

The Components of the TRUST Protocol

The Incentive Program

Contingency management (also referred to as Motivational Incentives) is a technique that provides rewards ("incentives") to patients in SUD treatment for accomplishing tasks that support recovery. As reviewed in Chapter 1, contingency management (CM) is the technique with the greatest evidence of effectiveness for StimUD treatment. In the research trials that have shown CM to be effective, the amount of possible reinforcement that can be earned by study participants has ranged from $300-$1200 over a 12- or 16-week period. Average amounts in research studies are in the range of $500 over 12 weeks. In addition, in CM

research studies, the value of the incentive increases as participants achieve sustained periods of abstinence. For example, in some studies, the first stimulant-free urine sample earns an incentive worth $2.50, and when three consecutive stimulant-free samples are given, the value of the 3rd sample would increase to $5. As consecutive negative samples increased, so did the value of the incentive. Once the higher values are achieved, if there is a relapse and a positive urine sample is given, the incentive value returns (resets) to the original value ($2.50). In this way, patients are rewarded for gaining longer stretches of continuous stimulant abstinence. This escalating schedule of incentive values with the reset is a component in all CM research.

The TRUST manual does not implement Contingency Management. TRUST uses a modest incentive program.

Medicaid regulations establish a limit of $75 per patient per year as the maximum amount of total incentives a patient who has Medicaid insurance can receive for behaviors that promote health. (Office of Inspector General Policy Statement Regarding Gifts of Nominal Value To Medicare and Medicaid Beneficiaries, Dec 7, 2016). Therefore, because of this modest available incentive amount, it is not feasible to structure a full contingency management protocol. However, we believe the use of positive reinforcement (incentives) for positive behavior change can still promote treatment goals and be a useful component of this manualized treatment protocol. For this reason, we will refer to the systematic delivery of rewards for target behaviors as the "Incentive Program" component.

Incentive Program

The incentive program recommended for use in the TRUST manual is developed to be simple and to be compliant with the current Medicaid regulations regarding limits on incentives. At the orientation session, patients should be given a $5 gift card and patients should be told that the incentives are part of the TRUST program to support their participation and progress. We want them to know that we understand that it is hard to always find the motivation to make positive progress and the incentives are an extra way we support their effort.

The specific incentive program can be one of two models: 1. Incentives for attendance at treatment sessions. Beginning with the first individual or group session, participants receive a $5 gift card for each individual and group session they attend, up to a limit of $75 total. 2. Incentives for reduced stimulant use. At each weekly session where a urine sample (or saliva sample) is collected, if the result is negative for stimulants, a $10 gift card is earned and given to the patient. Described in more detail in Chapter 5.

Motivational Interviewing

As described in Chapter 3, a number of MI skills are particularly useful in promoting engagement with patients and helping to address some aspects of patient ambivalence and reluctance to make behavior change. The use of these specific MI skills is highly recommended. To an even greater extent, we see the spirit of MI, especially compassion and acceptance, as fundamental to the success of treatment using the TRUST (or for any) approach for StimUD treatment. We hope that an overarching message in the TRUST protocol is that individuals with StimUD must be treated with compassion and dignity throughout their treatment experience.

Cognitive Behavioral Therapy and Community Reinforcement Approach

CBT and CRA are both "talk therapies" that teach, encourage, and reinforce patients to have a better understanding of their own behavior and to develop some active techniques to make behavior change.

One of the major foci of the CBT exercises in this protocol is helping patients learn about the conditioned cues that often set off their craving for stimulants. These "triggers" established via Pavlovian conditioning are extremely powerful events that can often derail a patient's progress. It can be helpful for them to understand this "triggering" process, avoid triggers if possible, and cope with them when they occur. In addition, there is an emphasis on helping patients manage their time and find drug-free environments and people to help support their recovery efforts.

The major contribution of the CRA exercises is to educate and encourage patients to develop new non-drug related, reinforcing behaviors that help sustain progress in recovery. When a person has StimUD, methamphetamine and cocaine become the dominant source of reward in their lives. When they attempt to reduce/stop their use of stimulants, their lives are often devoid of reinforcement and can seem joyless and empty. Part of the anhedonia that patients experience is often expressed in terms of "there is nothing positive in my life." CRA strategies educate and assist people in initiating and sustaining new behaviors that support recovery and provide new sources of enjoyment and reward in life.

Physical Exercise

There is a vast amount of research that supports the benefits of exercise on physical health (e.g., cardiovascular health). More recently a robust set of evidence has been collected to document the benefits that exercise has on mental health symptoms, particularly anxiety and depression. In the past decade, there is a newly developing collection of research that shows that physical exercise can be useful to individuals in recovery from StimUD.

Several NIDA-funded studies have reported that for individuals with StimUD, exercise can produce brain changes that help people address the commonly experienced anhedonia, anxiety, and depression in the early months of recovery. Further, return to methamphetamine use was reduced if a residential treatment program was augmented with a program of regular exercise. For this reason, exercise is integrated into the TRUST protocol.

Continuing Care

Obviously 12 weeks is merely the beginning of the process to reduce/discontinue cocaine and methamphetamine use. It is essential for individuals with StimUD to have a support system to help them progress and build their life in recovery. The continuing care component is a very modest framework to provide support. Clearly a successful sustained recovery requires long term behavioral change and development of many new activities and attitudes. Continued participation in exercise and learning CRA and CBT concepts and other strategies to promote physical and mental benefits are essential for sustained benefits. 12-Step and other self-help activities can be valuable and available support systems. Additional participation in treatment activities and approaches listed in the appendix can be also be useful.

Retention in treatment-An overarching priority

As we have come to recognize substance use disorders as chronic health problems, our treatments have necessarily become increasingly focused on retaining patients in treatment and recovery services for extended periods of time. As was recognized by the founders of Alcoholics Anonymous (AA) and supported by decades of research, the longer a person remains involved in treatment and/or recovery activities, the less drugs/alcohol they use, the less they are involved in criminal justice activities, and the better they function within their families and communities. An even more direct measure of the importance of patient retention in treatment can be seen in overdose death statistics. People with SUD who currently are in treatment or recovery activities have far lower rates of overdose deaths than those with SUD who are not involved in treatment or recovery activities. In short, retaining patients in treatment reduces overdose death rates.

Retaining people with StimUD in treatment is a major challenge. There are no medications like buprenorphine or methadone that support retaining patients in treatment. With the tools currently available, two of the most powerful factors in promoting treatment retention are the use of incentives and a positive therapeutic relationship between the therapist and the patient. In this manual, we include an incentive component to promote retention, and we strongly recommend the use of motivational interviewing as a way of encouraging a strong positive relationship between patients and treatment staff. For many patients, the relationship with their therapist is the glue that holds patients in treatment. In the next chapter, we describe some of the essential MI skills that are of greatest importance in retaining people in treatment.

There are other factors that can reduce treatment drop out/promote treatment retention. First, it is important that patients have transportation to get to and from the treatment site. For those with transportation challenges, it may be possible to do some of the treatment activity over a telemedicine platform. It is also important that the treatment sessions are scheduled on days/times that are compatible with patient schedules (i.e., working patients may need evening treatment sessions). Childcare can be a challenge for some patients. In some treatment programs, childcare is provided on site, which can be a major benefit to many patients who have childcare responsibilities. Finally, many patients in outpatient treatment live in unstable/active drug use situations. For these patients, consideration should be

given, in line with ASAM Criteria, to include drug-free housing as part of their treatment plan.

Often patients miss treatment sessions, and when this occurs, it is important for staff to reach out by phone/text (following proper patient privacy/security protocols) to encourage patients to come for a replacement session and/or to attend their next scheduled session. Patients who have recently stopped methamphetamine or cocaine have very chaotic and disorganized lives and are cognitively impaired. Attending scheduled sessions on time can be a major challenge. Therefore, it is important for staff to maintain a positive and supportive attitude that recognizes the difficulty of treatment participation for patients. Attendance should be praised/reinforced, and those who have attendance problems should be given continuing support and encouragement to attend.

Treatment practices that promote retention

- ✓ Positive, supportive, safe environment
- ✓ Use a non-judgmental, MI interaction style with patients
- ✓ Use positive incentives (whenever possible, contingency management)
- ✓ When possible, make snacks and drinks available
- ✓ Support with transportation
- ✓ Childcare on-site
- ✓ Flexible service hours (evenings, weekends)
- ✓ Telephone/text outreach and encouragement when patients miss sessions
- ✓ Coordinating care with primary care and mental health professionals (*or even better, fully integrations StimUD care with primary and mental health care*)

Chapter 3: Motivational Interviewing

This chapter on Motivational Interviewing (MI) is not meant to be an exhaustive tutorial, but rather an overview of some basic MI skills that are of great importance in working with patients with StimUD. These skills help therapists work with the ambivalence of patients and promote positive attitude and behavior change. MI is a set of skills that must be learned and used in your treatment activities**.** Practice**,** practice, practice.

Motivational Interviewing developed by Miller and Rollnick (1991) is a way to interact with individuals to strengthen their personal motivation towards achieving a specific goal. Building on the humanistic concepts of Carl Rogers, MI recognizes and validates an individual's right to make their own choices. Additionally, research shows there is a protective factor, in the form of reducing burnout for the therapists consistently engaging in MI-adherent interactions.

There are a wide range of on-line training courses on MI. These include: Single and Multi-day courses.

https://attcnetwork.org/centers/northwest-attc/motivational-interviewing-mi.

The "Spirit" of Motivational Interviewing

The underlying **Spirit of MI** includes *Compassion, Partnership, Acceptance and Evocation.* Developing a helping relationship requires each of these components to be able to thrive. A patient must feel accepted and not judged, feel empathy and not pity, be a valued-equal team member, to be able to talk openly about their deepest darkest secrets which may not have ever been shared with another person. The shame, guilt and embarrassment that accompany behaviors that frequently occur to obtain drugs or while under-the-influence of drugs can overwhelm the desire to be open and honest. MI provides a set of skills that helps the therapist communicate to a patient that they are safe to share personal information without being judged or criticized.

What would take it for you to be able to share your innermost thoughts and feelings with another person? What characteristics or qualities would that person need to have for you to let your guard down?

The spirit of MI is a requisite to set the tone for a productive relationship. This spirit and the skills to express empathy, compassion and acceptance are essential throughout all the activities in the TRUST protocol.

Principles of Motivational Interviewing

The five principles of Motivational Interviewing are as follows:

- Express Empathy
- Develop discrepancy between the individual's goals and current situation
- Avoid confrontation
- Recognize and adjust to resistance to promote change talk
- Promote self-efficacy

Expressing Empathy

MI emphasizes "meeting an individual where they are" and accepting that the patient may be very early in the process of recognizing their addiction. Before MI was used in substance use disorder treatment, patients who were less than fully compliant were viewed as "in denial" and often sent away from treatment and told to "come back when you are ready to change." This toxic, judgmental attitude and approach toward people with StimUD is neither ethical nor acceptable. Patients turned away or kicked out of treatment are at very high risk of overdose and death.

MI recognizes ambivalence as a "normal" part of making difficult behavioral changes. Instead of judging the individual as being "not ready," or "in denial" use of MI helps the therapist to communicate understanding and acceptance of the patient's condition and their right to make their own decisions. Early in an individual's struggle with StimUD, it is often difficult to envision the need for change. Through the use of MI, the therapist can express to the patient that the decision to change their life and begin a program of recovery is a decision that can only be made by the patient.

Through the expression of empathy, the therapist accepts the patient's feelings and beliefs and communicates them in a respectful, non-judgmental manner in the form of a *Reflection*, one of the four MI Micro-skills.

It is important for the therapist to communicate to the patient that they recognize the patient-therapist relationship as a partnership. The individual with StimUD brings to the treatment milieu a set of life experiences, skills, strengths, challenges and resources. The therapist also brings to the relationship a set of life experiences, skills, strengths, challenges and resources. From the interwoven, collective experience of these individuals, a platform of opportunity for change can be constructed to support the patient. The therapist serves at the behest of the patient and is there to listen, provide acceptance and support, while offering information and guidance if desired by the patient.

Developing Discrepancy

The Cambridge Dictionary defines "discrepancy" as: "a difference between two things that should be the same."

With MI we try to help patients develop a discrepancy between 1. where they currently are in relation to their stated goal(s) and 2. where they would ultimately like to be or like to achieve.

Patients are encouraged to share how they could change their lives to better achieve their goals. It can be helpful to encourage patients to think about how they might go about making changes: "change talk." In this discussion it is helpful for patients to talk about: the not-so-good things about making those changes as well as the good things about making the stated changes. Engaging in this exercise helps to create a vision for the direction the change process can take, serve as a roadmap for change and can become the foundation in developing a sense of accountability, and ultimately self-efficacy.

A useful tool in the effort to develop discrepancy between the individual's current situation or life circumstances and personal goals, is to look to the future. Often when a person who uses substances reflects upon their past, they feel a sense of loss, shame, guilt, self-doubt, trauma and disappointment. Looking ahead provides an opportunity for hope and a reason to make change. Listening for "Change Talk" as the patient describes the urgency and importance that cutting back or

ceasing drug use provides the therapist insight as to what is important to the patient, and potentially specific steps they are willing to take.

Avoiding Confrontation and Adjusting to Resistance

Individuals with StimUD typically come into treatment with a great deal of ambivalence about whether or not they have a problem with drugs and with considerable ambivalence towards change. This is the rule, not the exception. Frequently they express strong opinions about why they don't need treatment, don't need as much treatment, why any kind of "schedule" of treatment activities won't work for them and why many treatment recommendations don't apply to them. Being able to listen to patients give their opinions, without disagreeing with what they are saying and/or arguing with them does take considerable patience and discipline.

Understanding and acceptance of the patient's perspective is foremost to establishing rapport. Acceptance of the individual is not the same as approval of the patient's behaviors. Lecturing, arguing, criticizing, making sarcastic comments and scolding are inconsistent with the spirit of MI and tend to produce discord and friction in the patient-therapist relationship. Active listening to understand the patient's perspective about their drug use and its role in their life is an important step in relationship building.

Promote Self-Efficacy

Recognizing incremental change in our patients is an invaluable tool towards facilitating "self-efficacy." The use of affirmations to highlight their positive actions can help to bolster confidence and enhance motivation while reinforcing the exact behaviors most likely to lead to a successful recovery.

Genuine affirmations increase change talk. "It's great you were able to come in today." "Great work in following the schedule you made. That is a big step in the right direction." When a patient shows up late to their appointment, the therapist who scolds the patient for tardiness fails to acknowledge that the patient has indeed made the effort to attend their appointment. Acknowledging the challenges the patient faces in taking multiple buses, traveling great distances, or getting their

kids off to school prior to coming into the appointment, is a way to validate the patient and enhance motivation.

Enhance Change-Talk

Expressions of *Desire* ("I want to …", "I would like to …"), *Ability* ("I think I can do that!", "I've done that before!") *Reasons* ("If I don't make these changes I think my partner is going to leave me!") and *Need* ("I got so sick the other day, I have to stop drinking!") are considered preparatory change talk statements. These statements can be viewed as an invitation to the therapist to provide an open-ended question, affirmation, or reflective statement as a way to learn more, reinforce, or check for clarity on the statement made.

Motivational Interviewing Core Skills

Expressions of *Commitment*, *Activation, or Taking Steps* are considered "Mobilizing Change-Talk" with an individual preparing to act, move into action, or having already taken steps to elevate their condition. Again, utilizing the MI Micro-skills of:

Open-ended Questions,

Affirmations,

Reflections and,

Summaries.

(OARS) can serve the therapist in reinforcing statements of change (Change-talk) thereby increasing the likelihood of change occurring.

Curiosity is an incredibly powerful resource at the disposal of the therapist, which will go a long way to establish rapport and build trust. Being curious about your patient indicates that you are interested in them. Be curious. "Where did you go to high school"? "Were you involved in sports? " "How many brothers and sisters do you have and where do they live?" Understanding the perceived value that stimulant use has provided the patient, and conversely, the challenges that stimulant use has presented for the patient and their family, will allow the therapist to more fully comprehend the impact stimulant use has had on the individual.

This process may ultimately highlight the central theme(s) towards developing discrepancies.

Open-ended questions such as: “How would you like for things to be different? “ “What would it take to achieve those goals you just described?” will provide patients an opportunity to articulate where they would ultimately like to be, and what they would like to accomplish during the time you are working together. Gaining this insight can be invaluable, both in terms of learning to understand what is important to your patient and towards developing a meaningful, individualized treatment plan.

An individual who uses stimulants may want to regain custody of their children, or may want to get their probation officer off their back. As they consider these challenges, they often do not view their drug use as the problem, rather, they view the problem as the child protective services or the probation officer.

Many therapists would consider these individuals to be in “denial” and confront them by saying “You know, your meth use is why you lost your children and if you stopped using meth you might have a chance to get them back.” or “If you stopped using and went to meetings, your probation officer might see you as being serious about your recovery.”

In each of these cases, the patient has indicated what their desires are, “to get their children back” or to “get in the good graces of their probation officer.” A simple reflection, such as, “Your children are important to you”, or an open-ended question, “What would it take to get your PO off your back?” provide an opportunity for the patient to express their own course of action(s) for change and avoids discord in the form of an argument or confrontation around the need to stop using substances.

As we began this section on Motivational Interviewing, we will end this section by emphasizing that **Motivational Interviewing is a set of skills that must be learned and used in your treatment activities. Practice, practice, practice.**

Case – Example 1:

Carl is 41-year-old male with an 11-year history of meth use. He is separated from his wife of 14 years, Rachel, and three children, Carl Jr age 14, Erin age 12 and Jonathan age 9.

Carl recently lost his job as a driver at the quarry as a result of his arrest and conviction for reckless driving and driving under the influence of methamphetamine. Carl was referred to the Safeway Treatment Program by his probation officer who appears to be interested in Carl's recovery and rehabilitation.

This is Carl's third treatment episode for stimulant use disorder in the last four years. His longest period of abstinence over that period is 4 months.

You are conducting an orientation session and inquiring about his interest in treatment:

Therapist: Good Afternoon Carl, my name is Chris, nice to meet you. How are things going for you?

Carl: Not so well. My PO is on my case and has told me that I either come here or go to jail. I've been to treatment two times and it doesn't work. I don't think I need treatment. I've been to jail and now I know I am just not going to use.

If you were Carl's therapist how would you respond?

Potential responses could be:

1. You value your freedom.
2. So, you didn't have a choice!
3. You have a pretty good idea of how to stop your meth use.
4. Maybe you didn't put enough effort into the program to allow it to work.

How do you think the patient would respond to each of the above statements?

Which if the above statements would result in the least amount of push back from the patient, and encourage some form of Change-talk?

If you selected either statement 1 or 3 you are on the right path.

Therapist: You value your freedom!

Carl: Sure do. Look, the accident wasn't my fault. Some old lady stopped short in front of me and I barely clipped her fender. She insisted on filing a police report and when they arrived, they recognized me from a previous arrest and decided to take me in. I hadn't used meth in a couple of days, and they said the test was positive. My PO got his shorts in a bunch and told me that I had to get back into treatment. I don't use that often, and don't deserve to go to jail.

Potential responses:

1. Everyone says it wasn't their fault.
2. Driving under the influence is a felony.
3. You've been able to stop using before. How did that go for you?
4. You and the police are on a first name basis.

If you selected # 3 you are most likely to get a response that encourages change talk.

Therapist: You've been able to stop using before. How did that go for you?

Carl: Yeah, I was actually doing pretty well. I was going to meetings. Rachael and I were talking more, and I was spending more time with the kids; I really do miss them.

This statement is filled with Change-talk. How would you respond to Carl? What would keep him sharing his **D**esires, **A**bilities, **R**easons, and or **N**eed to make changes?

Case – Example # 2:

Lucy is a 28-year-old Latina living with her family in Costa Mesa, CA. Lucy completed her Bachelor's degree in business from Cal State Los Angeles four years ago. Until July of 2020 Lucy had been gainfully employed in the corporate offices for a major chain of toy stores which closed due to the pandemic.

Lucy reports using alcohol on a social basis, smoking cannabis occasionally, but doesn't consider either of them to be a problem. Lucy was introduced to meth by Robert, a young man that she met at the employment development department shortly after losing her job.

Initially Lucy used recreationally to enhance their sex life, though over the past several months her use has escalated to near daily. Her only source is Robert who was recently arrested for selling drugs to an undercover agent. Lucy doesn't want to go to any of Robert's using friends as their meth use seems to have consumed them.

Lucy is accompanied to this intake appointment by her mother, Maria and younger sister, Yolanda who both recognized that Lucy has been acting out-of-character since losing her job and meeting Robert.

Lastly, Lucy is reporting that she has missed her last two menstrual cycle and fears she is pregnant.

Below is a snippit of Lucy's interaction with her therapist, Francis. Evaluate how you think the interaction went, and what you might have done differently to engage Lucy.

Francis: “It’s nice to meet you Lucy, my name is Francis, thank you for coming in tonight. Can I get you a cup of tea, coffee or water?”

Lucy: “No thank you, we just had dinner, and I have my water bottle here.”

Francis: “What brings you to the clinic?”

Lucy: Breaking into tears and sobbing, “I lost my boyfriend, and I think I’m pregnant!”

Francis: “I’m sorry for your breakup. So, you’re unsure if you are pregnant. How about we get you a pregnancy test?”

Lucy: “I’ve missed my last two cycles, and Robert and I haven’t been using birth control.”

Francis: “I can understand your concern. If it’s ok with you, before you leave today, we’ll get you to see the doctor and get a couple tests ordered.”

Lucy: “I’m really scared that I have done something bad to my baby!”

Francis: “What is it that you think you’ve done to harm your baby?”

Lucy: “Look I didn’t know that I was pregnant and would never do anything to hurt a baby. You’re not going to turn me into the police, are you?”

From the list below, please select your response to Lucy's last statement, or in the space provided craft your own response:

1. We're not going to turn you in, but you should have been more responsible in your actions.

2. You're an educated woman, what were you thinking would happen by having unprotected sex?

3. I don't think your intention was to harm your baby. There are certain circumstances when we have to make a report, such as child or elder abuse, or when an individual threatens to do harm to themselves or another individual, and this is not one of those situations. Lucy, my job here is to support you in achieving the goals that you set for yourself.

4. Write your response here:

_____

_____

_____

Francis: You have a lot going on. There are a number of things that you have mentioned that I believe we can help you with.

What else brought you here to the clinic?

Lucy: Ok, I'll trust you this one time, but if I find out otherwise, we'll never speak again. Robert and I have been using meth for about six months. It started out as a once in a while thing, and then became more and more frequent, until it became a routine. It was pretty exciting at first, but then I found myself waking up and thinking about meth, instead of looking for a job, or any of the other things that I like to do.

I quit calling my family and they really were really concerned for me. Neither my Mom nor my sister liked Robert, so we quit going by the house.

He was recently arrested and I'm not going to cop from his friends. I don't like, nor do I trust them. They use Robert all the time, and I know for a fact that one of them dropped a dime on him.

How would you summarize the conversation to Lucy that just took place?

_____
_____
_____
_____

What you just wrote might look something like the following:

Francis: Lucy, I'm glad you came in. It takes courage to ask for help. You've been through a lot lately. Let me see if I understand you correctly. You've missed a couple periods, and you want to find out if you are pregnant. You and your boyfriend Robert have been using meth for the better part of a year, and he was recently arrested. You've been avoiding your family because they don't like Robert and wouldn't approve of you doing meth. Lastly, you've decided that it would be best for you to get into treatment and stop using meth! What if anything did I miss?

Lucy: Yea, that's about it. Understand, I'm not like his tweaker friends. I don't use nearly as much as they do, and don't boost, nor do I sell my body to get drugs like some of them. I can stop whenever I want.

How would you respond to Lucy here? What would you describe as the "next steps" in the process?

_____
_____
_____

As you can gather from this interaction, this case, like most of the cases that you are presented, are not simple and cannot be adequately addressed in a brief tutorial on Motivational Interviewing. Our goal here is to engage the reader in a discussion intended to reflect the spirit of MI; to allow the reader to critically evaluate the

responses listed above, determine if they achieve the desired goal(s), and develop alternative, potentially, more suitable responses. Additionally, it is our hope that both individual and group supervision be provided as a forum to allow staff to practice engaging patients in such a way to enhance patient retention, progress in treatment and ultimately facilitate self-efficacy.

Chapter 4: Patient Orientation Session

When individuals are admitted into treatment for StimUD, they complete a variety of medical and psychosocial evaluations and frequently treatment placement assessments using the ASAM Criteria. After the individual has completed the evaluation and placement process and if they are appropriate for treatment in the outpatient protocol described in the TRUST manual, they can be oriented for treatment. It may be that this orientation is provided at the same time as the medical/psychosocial assessment or in a subsequent appointment. To promote engagement, the time period between the assessment and the orientation should be as short as possible.

Important considerations and skills in orienting patients to the TRUST protocol

It is important to orient patients to the elements of the TRUST protocol. It is useful to begin the orientation by asking the patient to provide an overview of their drug use history, with detailed information about recent stimulant use (amount, frequency, route of administration and time since last use). If there has been very recent use (past 24 hours) or very heavy use over the past 30 days (particularly via injection), the patient's attention span is likely to be limited, and the orientation should emphasize immediate priorities and expectations. For those who are less acutely impaired, the provider may take more time to explain the rationale for the program, the elements of the program, and find out more about the patient and their life in an effort to build a positive rapport.

It is important to give the patient an opportunity to talk about what they want from treatment. For many patients, this will be straightforward. The patient will describe how stimulant use has damaged their life and why they are in treatment to become abstinent from stimulants. Other patients will have goals that are less clear. They may say they hope to reduce, but not discontinue use of stimulants, or they may say they feel that they don't have a problem with stimulants, but they have been forced into treatment by family or legal pressure. Motivational interviewing skills will be extremely valuable in working with these patients (see previous chapter).

It is important to keep in mind that if individuals who use stimulants are attending treatment, their risk of overdose death is reduced. Getting them into treatment and retaining them in treatment are priorities. Not everyone enters treatment saying "the right things." However, individuals who express ambivalence about abstinence as a treatment goal and/or who express outright skepticism about treatment can benefit from information they receive in treatment and certainly, over time, they may modify their views of treatment and/or the benefits of discontinuing stimulant use. It is important to remember that this treatment is intended to meet the needs and treatment goals of the patient, which may or may not be the same as those of the majority of patients (and therapists).

Regardless of a patient's motives for treatment or treatment expectations, the priority is to get them "connected" to a therapist and to keep them coming back.

For ambivalent/skeptical individuals who are very vocal and dogmatic in their views, it may be necessary to conduct all their treatment sessions as individual sessions, rather than have them attend group. The same treatment content that is scheduled for group sessions can be delivered and discussed in individual sessions. Having an individual in a treatment group who has treatment goals that are very different than the other group members can be disruptive to the group and distract from the purpose of the group for all of the patients including the individual.

Patients should be oriented to the fact that the typical service schedule is for two visits per week for 12 weeks, followed by at least another 3 months of continuing care/recovery services. The therapist can discuss with the patient when the two sessions would be most convenient and plan a treatment schedule, with one individual and one group session. If possible, the same therapist should deliver all services to an individual patient as a way of maximizing rapport building and development of strong positive relationship.

It is helpful to explain to the patient that the treatment services will include group sessions and one individual session and one urine test per week. In addition,

treatment involves the development of an exercise program and that the patient will be able to earn some incentives in the form of gift cards.

In fact, when the patient attends the orientation session, they will receive their first gift card worth $5. Following this first session patients can earn up to an additional $70 worth of gift cards or other incentives via the programs' incentive system.

It should be explained to patients that an unusual aspect of the TRUST protocol is that physical exercise in a formal component of the treatment experience. We encourage exercise because there is research to support the fact that for individuals with StimUD, a program of regular exercise can reduce symptoms of anxiety and depression, reduce drug craving, promote recovery in the brain's dopamine system and reduce the likelihood of a return to stimulant use following a period of abstinence.

It is useful in establishing rapport for the therapist to listen to any patient concerns and answer any questions the patient may have about the treatment. It is important to clarify that the individual and group sessions are designed to provide patients with new information and useful information for addressing their use of stimulants. Patients will be encouraged to take part in discussions, but it is their choice when and how much they want to talk.

It is important for therapists to keep in mind that when individuals who use cocaine and/or methamphetamine enter treatment, they are often disoriented, emotional, sleep deprived, and ashamed. For individuals with StimUD to "connect" with a therapist, it is important for the therapist to maintain a nonjudgmental and compassionate perspective. It is important for therapists to express encouragement, optimism, and genuine empathy. The point of most frequent treatment drop out is in the first 3 sessions. Therapists' ability to express genuine acceptance and compassion is essential.

Calendar and dots

One of the treatment activities that is conducted at each treatment session (individual and group) is a simple visual tracking exercise using a calendar page and colored stickers or "dots". Patients are encouraged to put a colored "dot" on each day that they have abstained from stimulant use. This calendar provides a visual record of their success at developing days abstinent from stimulants.

Patients are encouraged to do this exercise based upon their self-report of stimulant use. This small simple exercise can develop symbolic importance to patients, and frequently they will look forward with great enthusiasm to applying the dots to their calendar. On days when stimulant use occurs, no dot is applied. Over time for the majority of patients, the calendar pages become filled with dots and are a source of pride.

At the end of the orientation session, calendar and dots is introduced to patients. For those who have some non-use days, they can apply dots to their pretreatment stimulant abstinent dates. For many, they may have used within hours and do not have any days to mark with a dot. When they come in for each session, they are encouraged as a first activity to apply these dots throughout the 12-week treatment experience.

Orientation Checklist

In the orientation session it is useful to:

Review drug history and recent events that have brought the individual to treatment.

1. Determine goals in treatment and discuss and agree on a treatment session schedule.
2. Describe the group and individual session format and content.
3. Provide a brief explanation of the incentive and exercise treatment components.
4. Begin "calendar and stickers" routine.
5. Make a specific plan for the first treatment session, and help the patient schedule their time from when they leave your office until their next appointment.

Orientation Summary: We are glad you have come to treatment, and we hope you fully benefit by attending all the scheduled sessions. "Come to Treatment, Stay in Treatment"

It can be helpful to give patients the metaphor that treatment groups and individual sessions are like doses of medicine. The more consistent they are in attending, the more "medicine" they receive and the more they benefit. If they have some

challenges in attending treatment, we hope that they will let the therapist know so they can get some help with finding a way to "attend".

It is good to remind patients that if they are going to miss an appointment, let the therapist know and see how an alternative can be created to allow the patient to participate in the session.

Let the patient know that if they unexpectedly miss an appointment, you will call/text/email them to connect and reschedule.

In addition, it is good to let the patient know that if they are going to be late for a session, they should come anyway. Attending twice per week provides a valuable structure to their recovery and a brief visit is far better than no visit. If patients encounter problems between appointments (for example, craving, emotional difficulty, drug use), they should contact the therapist by phone or text.

COVID-19 Considerations and/or Transportation Considerations

During the current COVID-19 pandemic, it may not be practical for patients to attend twice weekly in person sessions. It may be necessary to use telemedicine/zoom/skype etc. for some patients for some sessions. There is no research currently available to guide how this can be done optimally. Some experienced treatment practitioners currently in this struggle have observed that they feel that for many patients, individual sessions can be done with good participation and effect over a video platform. Group sessions are more challenging to do on a video platform, but possible. The one observation made by numerous experienced clinicians is that it is not optimal to move the entire treatment to a remote platform. Some amount of in-person attendance is considered important. According to these clinicians, a mixture of in-person and remote video sessions may be optimal.

Of course, in the case of patients with high-risk profiles and high concern about infection it may be necessary to deliver all sessions by video or even telephone (or a "chat" service?). Similarly, some patients start treatment with an ability to travel to the clinic, but at some point, lose their transportation. For these patients a remote video platform may be the only viable alternative.

Chapter 5: Incentive Program

Contingency Management (CM)

Contingency management (CM), also known as motivational incentives, applies the principles of positive reinforcement for performance of desired behaviors consistent with abstinence from cocaine or MA. CM involves the contingent delivery of an incentive for "target behaviors" such as attendance at treatment sessions, drug-negative urine specimens, or other behaviors that promote reduction/cessation of stimulant use. Incentives include desired items or privileges, such as vouchers or gift cards or "prizes". The goal of contingency management is to use robust incentives to help individuals struggling with stimulant use disorder to discontinue or reduce their cocaine and/or methamphetamine use. There have been multiple systematic reviews and meta-analyses that clearly document that of all behavioral strategies (and there are no approved effective medications), contingency management/incentives has by far the best evidence of effectiveness for the reduction of stimulant use by individuals with StimUD (e.g., DeCrecenso, et al., 2018; Farrell et al., 2019). Currently, CM is the primary approach for treatment stimulant use in the VA system DePhilippis et al., (2018).

Due to current questions about the acceptable use of CM with patients on Medicaid, CM, as supported in empirical research is <u>currently not used</u> in TRUST. Over time as federal requirements become clear, we hope that a full robust CM program will be possible. At that time, CM should become the foundation of treatment of individuals who use stimulants.

Incentive Program in TRUST

The TRUST protocol employs an incentive program that provides up to $75 in incentives (gift cards) to patients to promote attendance at treatment or reduction in stimulant use. In Chapter 4, the Patient Orientation Session chapter, the concept of incentives is explained to the patient. In fact, we recommend that individuals who are entering treatment are automatically given a $5 gift card for attending the initial Patient Orientation session. This $5 gift card provides a small incentive to promote treatment initiation and lets patients experience the reality that they can earn incentives as part of treatment in the TRUST protocol. As always when

incentives are provided the gift card should be presented with praise and enthusiasm. A note: **Cash is never used as an incentive**. For people with StimUD, cash can be a trigger and can result in triggering use of stimulants.

Recommended use of incentives within the TRUST protocol

1. Provide an automatic $5 gift card for attending the patient orientation session.

2. Choose either A. or B below.

   A. Incentives to promote retention. Provide $5 gift cards for each individual and each group session, up to a maximum of $75 total. During the first 4 weeks of the TRUST protocol there are 2 group and one individual session. If a patient attends all of these sessions, they can earn $60 in the first 4 weeks (3 sessions x $5 x 4weeks). If they then attended the 2 sessions in week 5, they would earn the $75 incentives in the first 5 weeks of treatment.

   B. Incentives to promote reduction in stimulant use. Provide a $10 gift card for each stimulant-negative urine specimen. If this model is used, it is essential to have point of care urine testing, so the incentive can be delivered immediately after the sample is provided and tested. In addition, specimens should be temperature monitored to ensure validity. If a patient provided all stimulant-negative UAs from the start of treatment, they would earn the $75 maximum incentive total in week 7.

We have purposely structured the incentive program in a way that it will reduce early drop out and help patients stop their stimulant use in the early weeks of treatment. It is our hope that all patients earn the maximum incentive as quickly as possible. We hope this schedule will focus the incentive benefit on the early weeks in treatment when patients are most vulnerable to drop out and have the most difficulty in stopping their stimulant use.

General recommendations on use of incentives in TRUST

- **Maintain security and a record of incentive delivery**. Use of incentives involves having incentives in the clinic that are worth considerable value. For example, if a program is going to treat 40 patients with TRUST and they plan to use gift cards incentives, they will have 40 x $75 worth of gift cards.

In this case, $3000 worth of gift cards will be used over the course of the program. It is extremely important to have a robust security and recordkeeping plan for the gift cards. In situations where a large supply of gift cards is kept in clinics, they can be great sources of temptation for patients and staff if not carefully monitored and secured. Theft of gift cards by patients and/or staff is a very demoralizing event, and good security and recordkeeping are needed to avoid this situation.

- If gift cards are used, have a variety of cards for stores where they can be redeemed. Some patients prefer gasoline cards, others Walmart or Target, others grocery store cards. It is important that the cards can be redeemed for items that are desired by the patient. To the extent possible, if gift cards can be used that do not allow for purchase of alcohol, this is an excellent option.

- If, during the COVID pandemic, in person contact is reduced but treatment is still being delivered via telemedicine/zoom/skype, it is possible to provide electronic gift card delivery. Hopefully when COVID adaptations are made to treatment programming, efforts to sustain the incentive program will be made.

Not an incentive: Compensation for the 12-week evaluation

We are hoping to collect some evaluation data from individuals who enroll in the TRUST protocol. One important component of the evaluation will be a short questionnaire that we expect to be collected at 12 weeks after the Program Orientation session. We hope to collect these questionnaires FROM ALL PATIENTS, whether they are in treatment or not. At the time they complete the 12-week evaluation questionnaire, they will be compensated with a $25 gift card. This $25 gift card is compensation for their completion of the evaluation forms, it is not an "incentive." Patients should be reminded that they will receive the $25 at week 12 and if they remain in treatment, they will be sure to get this compensation with certainty.

Chapter 6: Exercise for Stimulant Use Disorder

There is excellent evidence that physical exercise has many medical and psychological benefits. There is a growing body of literature that exercise can have substantial benefits for individuals in recovery from drugs and alcohol use disorder. One of the recent studies by the authors has shown exercise to be particularly useful for individuals who use methamphetamine. One study does not provide sufficient evidence to establish exercise as an evidence-based intervention, but we think the research support is very promising. We think the inclusion of exercise can be of great help to individuals in early recovery (and later recovery) from StimUD.

Although we think the evidence supports promoting exercise with our patients in StimUD recovery, we cannot claim to know the best types of exercise, nor, and importantly, the best way to get individuals in treatment to develop exercise as part of their lives. This will be your challenge. We offer some suggestions, but at the present time, these are "best guesses" and we hope clinicians using this manual will use their clinical creativity to help patients develop exercise as a short term treatment strategy as well as a lifetime habit.

Exercise is effective for medical conditions and symptoms

The U.S. Department of Health and Human Services' updated *Physical Activity Guidelines for Americans* (USDHHS, 2018) provides a comprehensive review of the literature and documents strong evidence for the general health benefits of physical activity. For adults, improvements ensuing from regular exercise at moderate levels include lower risk of early death, heart disease, stroke, diabetes, high blood pressure, adverse blood lipid profile, metabolic syndrome, and colon and breast cancers. Exercise is helpful for the prevention of weight gain and weight loss, particularly when combined with a lower caloric diet and is also associated with improved cardio-respiratory and muscular fitness, and better sleep and cognitive function.

Exercise is effective for psychiatric conditions and symptoms

Aerobic and resistance exercise interventions are useful for a wide range of psychiatric conditions, including anxiety and depression (Saeed, Cunningham, & Bloch, 2019; Zschucke, Gaudlitz, & Ströhle, 2013). The majority of studies have demonstrated efficacy of exercise in reducing symptoms of depression in both inpatient (Martinsen, Medhus, & Sandvik, 1985) and outpatient (e.g., McNeil, LeBlanc, & Joyner, 1991) settings; favorable results have been highlighted in several review articles (e.g., Barbour, Edenfield, & Blumenthal, 2007; Martinsen, 2008) and meta-analyses (Craft & Landers, 1998; North, McCullagh, & Tran, 1990).

Exercise and substance use disorders

Exercise may hasten or improve recovery from SUDs by modifying underlying neurobiological processes, such as dopamine activity (Robertson et al., 2016). Cognitive deficits have been observed in individuals who use substances chronically as evidenced by poor performance on memory, attention tasks, and learning deficits (Ramey & Regier 2018). Substance use disorders are also associated with poor impulse control and selective processing (Lundvquist, 2005). These deficits are positively affected by exercise. In addition, exercise has been shown to ameliorate negative mood states that may contribute to a resumption of substance use.

Study of exercise as an intervention for methamphetamine use disorder

From 2010–2015, a UCLA research team conducted a NIDA-funded evaluation of exercise as a therapeutic intervention for individuals who use methamphetamine in early abstinence. The study examined the utility and efficacy of an 8-week, evidence-based aerobic and resistance exercise intervention to promote improved treatment outcomes for a sample of 150 individuals in residential treatment for methamphetamine use disorder. The study examined medical, psychiatric, neurocognitive, and behavioral benefits that may accrue during participation in the 8-week exercise intervention, as well as possible sustained beneficial impacts on drug use following completion of the exercise protocol and discharge from the residential treatment program. The project also included a brain imaging component to collect data leading to an improved understanding of the mechanisms that may underlie observed effects on treatment outcomes and symptom remediation associated with the exercise intervention.

DSM-IV-diagnosed methamphetamine dependent individuals were screened to determine eligibility, and those randomized to the exercise intervention participated in supervised progressive endurance and resistance training 3 times per week for 8 weeks (24 sessions), consistent with current guidelines for comprehensive exercise programs (American College of Sports Medicine [ACSM], 2000). Each session consisted of a 5-minute warm-up, 30 minutes of aerobic activity on a treadmill, 15 minutes of resistance training, and a 5-minute cool-down with stretching and light calisthenics.

Participants randomized to the control condition participated in a health and wellness education session 3 times a week for 45 minutes.

Results from the exercise study

Over the course of the 8-week trial, individuals who used methamphetamine were able to safely engage in exercise and derived significant health benefits over a short period. Study results demonstrated that in comparison to the control condition:

- ✓ Exercise improved aerobic fitness, body composition, and muscle strength.
- ✓ Exercise improved striatal dopamine receptor binding.
- ✓ Exercise increased heart rate variability.
- ✓ Exercise group participants with less severe baseline methamphetamine use provided more stimulant-free UAs at multiple time points discharge.
- ✓ Exercise reduced depression and anxiety symptom severity.
- ✓ Exercise reduced craving for methamphetamine.

Conclusion

Exercise is a useful approach to aiding individuals with SUDs in their efforts to avoid drug use after they have achieved abstinence via treatment. Exercise facilitates abstinence by enhancing positive mood states and reduces craving. In addition, the new activity and routines (and frequently new friends) associated with developing an exercise program also helps people develop some new positive behaviors to support recovery.

Chapter 7: Drug Cessation Group (DCG)

The drug cessation group (DCG) is the initial group treatment experience for patients consisting of four, 60-minute groups. Often patients enter this group only a few days from their last use of stimulants or even with drugs still in their bloodstream. Therefore, frequently patients enter this group in a very emotionally unsteady or even volatile condition. Some may be very hyperactive, talkative, and unfocussed, while others may be very withdrawn, subdued, and reluctant to talk. The most important thing is that they have shown up for the group. Because this is the most important fact for all patients, patients deserve praise and a genuine and enthusiastic welcome to the group.

DCG Format and Content

Because being in a group is a new experience for many individuals, it is important for group leaders to be sensitive to how patients are functioning and to make sure they are not severely intoxicated or upset. If there are individuals who are too intoxicated or emotionally volatile, they should be taken aside and seen by another staff member who can assess their status and schedule them for the next available DC group. Patient safety considerations should be assessed, and a plan for their safe transportation to their housing arranged.

Each group session is initiated by asking each individual if they are OK and ready to begin. To begin each session, it is useful for the group leader to provide:

- A short introductory description of the purpose of the group (to help patients learn some information and skills that are important to stopping drug use).
- The group's duration (60 minutes).
- The format of the group (a topic and worksheet for discussion, plus time to learn about the patient).
- Permission for patients to talk or not to talk depending on their preference.
- A review of the group rules.
- Reminder of confidentiality of the group.

Because the group members are early in treatment and new to treatment, it's important for the leader to make the group a "safe" place. The group leader is the person in charge of the group, and it's important for the patients to know that the group leader will guide the discussions. Criticism or attacks by one patient on another is not allowed, and that the group agenda is fully under the control the group leader. This is NOT a "what's on your mind" group.

At the beginning of each group it is useful to allow each patient to introduce themselves and give a bit of background about how they happen to be in treatment, how long they have been in treatment, and what they hope to get from treatment. (Of course, if a patient is not comfortable talking, that is ok, and the group leader will suggest that they will come back to the patient at a later time to see if they feel comfortable talking).

The topic will be introduced, and the first 30 minutes of the group will be spent discussing the topic. Worksheets are passed around with a clipboard and pen/pencil. The group leader, or one of the group members who volunteers, reads through the worksheet out loud, then the members are given 5 minutes to write in some responses.

Using the worksheets as a focal point for discussion, the group leader asks patients for a sample of their responses and if this topic sounds like something they have experienced. Some patients will have a great deal to contribute, others will be quiet. It's important for the group leader to allow the time to be shared among all the group members. Surely the session will not be equally divided among members (some will not want to talk at all), but it's important that all members be given an opportunity and encouragement to speak and that no group member, including the therapist or group leader, monopolize the group.

The primary conversations in the group are between the group leader and each patient. In some ways, the group is almost a series of 1:1 sessions, while others are observing. At this early stage of group involvement, it is important for the group leader to manage the group quite assertively, linking patients' comments to a central theme. While patients may be asked to make observations about other patients' comments or challenges, spontaneous inter-patient dialogue generally is kept to a minimum (especially if there are patients being critical or confrontational).

From 30-45 minutes into the group, patients are given an opportunity to talk about their challenges, accomplishments and ask questions.

During the last 15 minutes, the scheduling handout is reviewed. For individuals who are in their first group, the group leader will introduce the concept to the new patient(s) and help them develop a very rudimentary schedule, building upon the scheduling process first introduced during the Orientation. During this time, the other group members can be working on their schedules. In the final 5 minutes, the schedule of each patient (DC worksheet A) is reviewed in group and the group leader can praise good decisions and/or suggest alternative plans if appropriate.

Drug Cessation Session Group Descriptions

DCG A: Scheduling

Helping patients create a plan for each day for staying away from stimulants is a central component to using behavioral treatment to stop using stimulants. Every session ends with every patient making a rough, hourly plan for the next 3-4 days. On a patient's first session, they are given a brief introduction to the task. Often the group leader works with new patients during their first session to help them understand the task. Once everyone has completed a schedule, they briefly discuss them and talk about any anticipated challenges and activities they may be looking forward to completing.

DCG 1: Drugs-Drug Paraphernalia-Drug-using Friends

One of the most important things to do when deciding to abstain from drug use is to throw away any remaining drugs and paraphernalia. This session helps patients take an inventory of their house, car, and other places where drug paraphernalia is located. Drug using friends and acquaintances also present extreme risk. Patients should determine who they need to avoid and have a prepared strategy for successfully avoiding these people, while developing drug refusal skills when they are unable to avoid them.

DCG 2: Five Common Challenges in Stopping Drug Use

There are a number of issues that are commonly experienced by individuals who use stimulants as they attempt to stop using cocaine or methamphetamine. This worksheet includes 5 of those issues and gives patients an opportunity to learn about the importance of these issues and to consider how they might address them

going forward. Drug using friends, drugs or alcohol at home, anger/irritability, boredom/loneliness, and special occasions present problems that may trigger craving and lead to drug use.

DCG 3: Triggers-Thought-Stopping

The Thought-Stopping handout is very useful to give patients some help in addressing drug cravings. Thought-stopping is a skill that patients can use to block drug thoughts and thereby regain control of their thinking process. Cravings do not have to overwhelm them. They can prevent cravings from occurring by blocking the thoughts that develop into craving. Another way to stop a craving is to engage in an activity to interrupt the process. This can be meditating, exercising, talking to someone, walking, or eating. They need to use this process quickly before the physiology of the craving gets started. Talk about how the craving cycle occurs and explore ways that will work to interrupt the cycle.

DCG 4: Your Brain and Stimulant Recovery

An understanding of the Pavlovian conditioning that underlies the craving and drug use cycle demystifies the seemingly self-destructive pattern of obsessive drug use for both the patient and family. This session is an opportunity to provide a brief explanation of the powerful conditioned cravings that persist despite intentions to stop drug use. The automatic nature of these cravings requires that real behavior change takes place. This topic is the underlying premise for many subsequent topics such as scheduling, triggers, and thought-stopping. It can be helpful to describe Pavlov's conditioning experiment and parallel the bell and salivary response with stimulants triggers and the craving response.

Cocaine and methamphetamine change the brain. It takes time for the brain to "recover" after stimulant use ends. It can be 4-6 months or more before the brain returns to something close to "normal" functioning. Over the course of this period it is common for a person to experience fluctuations in mood, thinking, and energy. A common mistake is to conclude that rough periods in the recovery are related to sobriety when in fact they are likely the aftereffects of the past drug use. Depression, sleep disturbances, ebullience, irritability, high or low energy, and drug cravings may all occur at different times over months. Understanding that this is a normal occurrence and is reflective of a healing process can prevent catastrophizing and succumbing to relapse.

Chapter 8: Recovery Skills Group (RSG)

The 12 weekly, 90 minute sessions of the Recovery Skills Group (RSG) provide information, promote new skills, provide strategies for addressing challenging situations and encourage patients to make valuable behavior change. The topics and materials included in these 12 sessions are adapted from the NIDA Community Reinforcement Approach (CRA) manual (NIDA, 1998) and the cognitive behavior therapy materials included in the Matrix Manual (SAMHSA, 2006). The group setting provides an opportunity for patients to learn from other patients and to develop a peer group and receive support and encouragement.

RSG Format and Content

The session format and counseling approach used in the RSG are similar to the methods used in the DCG (Chapter 5). Patients are given the opportunity to apply dots to their calendars. Each group meeting begins with new members introducing themselves and giving a brief description of their substance use history, and success in the recovery process.

Following the introductions and during the first 15 minutes of the session, the therapist orients group members to the session topic in a casual, didactic manner, emphasizing why this topic is important. It can be useful to have a patient-volunteer read through the worksheet (some people are uncomfortable reading aloud and should not be pressured to complete this task).

The therapist then addresses specific parts of the topic, and/or specific input given by patients to written responses on the worksheet. Each patient should have the opportunity to discuss the topic and how it does/does not apply to their situation. Over the first hour of the meeting, the therapist ensures that all the important aspects of the topic are covered and that premature digressions from the main topic are avoided. The therapist wraps up the discussion period with a reiteration of the session topic and the important issues relevant to it.

During the last 30 minutes of each group session, the therapist asks patients whether they have had any recent problems or whether they wish to bring up any matters. Individual patients, particularly those who have been having problems or

those who have not participated in the group session, should be encouraged to participate. General questions that usually evoke a response include the following:

What new developments have occurred with the problem you brought up last time? Describe any cravings and talk about how you handled them. What are your plans for not using stimulants this week?

The therapist summarizes the discussion and acknowledges any unresolved issues. Discussion of these issues can be carried over to the next meeting. The therapist can ask patients who during the session mentioned cravings or who appear troubled, angry, or depressed to stay afterward to talk briefly and to schedule them for individual sessions as soon as possible. All sessions should end with a brief review of their scheduling exercise, a reminder that groups are confidential and a commitment by each patient to do their best to not use, and to attend the next RSG meeting.

Special Challenges

At times, the therapist may need to intervene assertively in response to specific types of patient behavior in the group. This intervention may consist of quieting a patient, limiting a patient's involvement in the group, or removing a patient from the group. Below are some strategies for handling troublesome behaviors.

Behavior: Occupying too much session time with an issue that has been addressed. Intervention: Politely suggest that it is time to allow others to discuss their issues and move on.

Behavior: Arguing in favor of behavior that is counter to recovery (e.g., using, dropping out of group, using self-control instead of avoiding triggers) after receiving repeated feedback. Intervention: Use MI skills to have patient review the not-so-good things and the good things (a decisional balance) related to courses of action.

Behavior: Making threatening, insulting, or personally directed remarks; behaving in a manner obviously indicative of intoxication. Intervention: Politely request the patient come out of the group with you and ask another therapist to safely get the patient home and address any immediate crises. Be sure that the patient has calmed down before leaving them. Arrange for transportation home if the patient cannot drive or get home safely.

Behavior: Having a general lack of commitment to treatment, as evidenced by poor attendance, resistance to treatment intervention, disruptive behavior, or repeated drug use. Intervention: Using MI skills, in individual session explore with patient if they can discuss their feelings about treatment and the various components of treatment. Ask if the patient would like to make changes in the treatment schedule or type of sessions. Adjust the treatment plan to better meet the needs of the patient.

Adapting Patient Worksheets

Worksheets are written in simpler language than the session descriptions for therapists. The patient materials should be understandable for someone with an eighth-grade reading level. Difficult words (e.g., abstinence, justification) are occasionally used. Therapists should be prepared to help patients who struggle with the material. Therapists should be aware that handouts will need to be adapted for patients with reading difficulties.

Recovery Skills Group Descriptions

RSG 1: Building a Recovery Support Program: Mooring Lines---- Avoiding Relapse Drift

Mooring lines– Ropes or cables that hold a boat from drifting away from its dock/pier.

This group is designed to guide patients in building a set of recovery behaviors and maintain them to avoid drug use. Also, it can help to highlight how recovery has been helped by avoiding certain risky situations. Remember, patients very early in sobriety or those who are still using will not have many mooring lines, if any, in place yet. A review of mooring lines is scheduled twice during the 12-week initial treatment and should be reviewed regularly in continuing care.

RSG 2-3: Internal/External Trigger Questionnaire/Trigger Chart

This session gives the patient a sense that their stimulant use will not be set off by random events. By asking what situations may be triggering them to use stimulants, they become more aware of when they are more likely to use. When

they change these triggering behaviors or stay away from the triggering situations, the chance of using can be reduced. The exercises in this session should help give the patient a feeling of greater understanding about what sets off the use episodes and how to avoid using. The reflexive nature of the craving process covered in the DC group "Your Brain and Recovery" should be emphasized to stress the importance of identifying and avoiding triggers.

RSG 4: Taking Care of Yourself

Doing things to take care of yourself is a way of showing respect for yourself. Emphasize that as a person in recovery, it is important to recognize personal value. Part of recovery is taking action to improve health and reflect a change in lifestyle. Some areas where action might be taken include dental, vision, grooming, diet, and healthy habits. Looking better and feeling better move a person farther away from the old ways.

RSG 5: Be Smart. Not Strong

Many times, people in recovery try to test the strength in their recovery process and put themselves into high-risk situations: Trying to be strong is not being smart. An exercise is included in the session to make patients more aware of how smart they are being in their recovery. Trying to tough your way out of drug use is not smart.

RSG 6: Drug Use Justification

The thinking, which is characteristic of a person moving toward drug use, is examined in this session. The point should be stressed that one may be less susceptible to these drug use justifications if they are identified and evaluated ahead of time. Ask patients to pick out particular drug use justifications to which they may have been susceptible in the past.

RSG 7: Building a Recovery Support Program: Mooring Lines---- Avoiding Relapse Drift

This group is designed to highlight the specific components of the recovery process that have already been started and must be continued. Also, it can help to highlight how recovery has been helped by avoiding certain risky situations. Remember patients in very early sobriety or those who are still using will not have many mooring lines, if any, in place yet. A review of mooring lines is scheduled twice during the 12-week initial treatment and should be reviewed regularly in continuing care.

RSG 8: Addictive Behavior

Ask patients to identify which behaviors were characteristic of their addiction. Emphasize that the re-emergence of these behaviors is an important signal of impending drug use. This is a good opportunity to point out necessary behavioral change and how these changes can lead the way to long-term sobriety.

RSG 9: Brain Tips

The brain is affected in many ways as a result of stimulant use. In fact, chronic use of cocaine and methamphetamine "injure" the brain. It's important to understand the ways in which the brain is injured and how this may affect thoughts, emotions and behaviors.

In early recovery many of our interactions with the world and with how we think and feel are changed and impaired. It is important to understand recovery from stimulant dependence involves a true "healing" of the brain.

Discussion of the topics in these sheets can help patients understand the reality of StimUD and recovery as involving the brain functioning in many ways.

RSG 10: Onward and Upward: Career/School/Parenting

One of the major factors in developing and maintaining a recovery is for an individual to feel positive and productive in their lives. Being a productive person

who is employed in a job they are proud of, or are in school to build a career, or are responsible for the care of their children, are among the biggest sources of reinforcement in life. A major contributor to positive self-esteem is the feeling that one is responsible for their own life and in many cases for support for their families. Very often career initiation and advancement is an essential part of a successful recovery.

Explanation:

It is important to individualize this discussion. For someone who has been unemployed and out of the workforce, this exercise has to focus on small steps toward identifying a potential career pathway with school or steps toward a starter job. For those who are in a job and hope to advance or move to a more rewarding job, this requires a different conversation. For individuals who are focusing on their role as parent, the exercise may focus on how they understand the importance of their parenting activity and steps they might take to make this activity more fulfilling.

Review of form:

Discuss with the patient their goals and aspirations and some possible steps they can take for advancement. Provide encouragement and praise for their willingness to work on improving this aspect of their lives.

RSG 11: <u>Recognizing and Reducing Stress</u>

Stress is a major cause of relapse. The two informational sheets provide some of the ways that stress can become part of drug use and can be a challenge in recovery. Patients can use the two information sheets to identify possible areas of stress.

The worksheet can help patients recognize their own signs of stress. They may be showing obvious signs of stress but not seeing these signs as being stress related. The leader and fellow group members may be able to help bring the signs to the patient's attention. Once signs of stress are recognized it is important to be able to alter behavior to reduce the level. As they become familiar with various stress reduction techniques, they should be encouraged to incorporate them into their daily living to prevent and reduce stress.

RSG 12: Drug Use Prevention

Drug use does not just happen. There are warning signs in behavior and thinking that patients can be taught to monitor. Also, there is frequently an emotional building prior to a return to use following a period of abstinence. This is a subtle and difficult concept. People with substance use disorders need to learn the indicators of stress and anxiety such as insomnia, nervousness, or headaches, and to view these as signals of possible drug use. Learning from previous experience is critical.

Chapter 9: Individual Coaching Sessions (ICS)

The individual coaching session (ICS) component of the TRUST protocol provides patients with an opportunity to establish an individualized relationship with a therapist and receive some of the TRUST protocol information that is optimally discussed in a 1:1 setting. The 1:1 setting allows the patient to discuss some issues they may not be comfortable discussing in a group setting. In this setting they can receive the nonjudgmental guidance and support of the therapist. Use of motivational interviewing skills in this context is strongly encouraged. The topics of the ICS include materials from CBT and CRA and are delivered with a motivational interviewing style.

Individual Coaching Session Rationale and Content

The ICS provides an opportunity for patients to develop their own recovery plan with the guidance and "coaching" of a therapist. In some programs, the incentive component may be delivered in these sessions and many of the other behavior change treatment components are discussed in these sessions.

Physical exercise. The ICS also provides the opportunity to help patients develop a program of physical exercise. Exercise is included in the TRUST protocol because there have been several studies that have shown it to be useful in stimulant recovery. Over the course of the 12-week program, we recommend the therapist ask about exercise frequently and help problem solve difficulties patients have in starting and sustaining exercise. Developing an exercise program is surely not a "one size fits all" concept. Therapists should be supportive of small steps and encouraging of patients to "keep trying".

Session Format and Content

One weekly, 45-minute session, provides an important opportunity for therapists to address the individual needs of patients. As described below, there are session topics and worksheets that cover some specific content areas of importance in stimulant treatment. However, these 12 individual coaching sessions need to have a balance of the planned worksheet topic coverage and time for therapists to ask questions and learn about details of the patients' background and current life and future aspirations and at the same time build rapport with patients and provide

them with positive reinforcement for their recovery efforts. In general, the topic can be covered in 20-25 minutes. The balance of the session can be used to discuss issue of current concern to the patient as well as review ongoing recovery activities (e.g., scheduling, exercise, etc.)

If possible, ICS should be scheduled on a day of the week that is not contiguous with the group sessions. For example, if the DCG and RSG are held early in the week (Monday/ Tuesday), it is preferable that the ICS be scheduled toward the end of the week (Thursday/ Friday) or vice versa. ICS scheduling should accommodate the patients' work/childcare/transportation/etc. situation to the extent possible. It is really important that patients who are working can attend treatment sessions during times that do not conflict with work hours (e.g., evenings). If a patient must choose between going to work or going to treatment, this almost always leads to premature treatment termination. Similarly, patients with transportation challenges need special accommodation (e.g., travel support or sessions via a secure website platform (e.g., Zoom, etc.)).

Individual Coaching Session Descriptions

ICS A: Drug Use Analysis and Chart

This session is not routinely scheduled, but it is useful when someone has resumed drug use. If the patient enters the session and reports drug use, it is useful to do at the start of the session to try and reframe the use, not as a failure, but as a signal that a change in the recovery plan is needed. Using this form can help reduce the embarrassment and upset that the patient feels about their drug use. A resumption of drug use does not occur suddenly and unpredictably. However, it often feels like it happens that way to the patient. The drug use analysis chart can be helpful in understanding the factors and signals that led to the resumption of drug use.

ICS 1: Functional Analysis

A functional analysis is an essential "starting point" to give the therapist a picture of the way in which stimulant use has become integrated into each patient's life. Listening to the individual describe the details of their drug use, provides a valuable array of information that will be critically important in helping the patient

develop a plan of recovery. It is important for the therapist to express genuine interest in and curiosity about the details of the when, where, why, with whom and what happens of an individual's stimulant use. Ask questions, be curious, try to understand how stimulants have become a part of each individual's life.

ICS 2: Exercise

Exercise is an intervention that can make a major difference in helping people with the challenging emotional symptoms that often are part of the early months of stimulant recovery. We know that chronic stimulant use damages the dopamine system and that individuals in the first 12-16 weeks (or longer) of stimulant recovery have very challenging symptoms of anhedonia, depression and anxiety. Often patients will say: "If this is how it is going to feel to be sober for the rest of my life, I can't live this way". Obviously, this emotional context can be a justification for use of stimulants. "I just needed to do this once, to feel normal", etc.

Exercise helps speed the recovery of the brain. Brain imaging studies have shown that exercise helps the dopamine system recover more quickly and that people who engage in 20-30 minutes of exercise, 3 times per week, have fewer negative emotional symptoms and fewer cravings. There have also been studies to show that exercise can help with concentration. Therefore, exercise has many of the benefits that we would find valuable in a medication to help individuals who use stimulants in recovery.

There are added benefits to exercise. Exercise is often a new (or long forgotten) set of behaviors that patients can use to build their non-drug using schedules. The exercise can be as simple as talking brisk walks with sober friends. Using exercise to build a new set of friends and ways to spend time can be an important building block in recovery.

Although exercise is introduced in this session, it is important for therapists to come back to the topic of exercise regularly though out the 12-week protocol and in continuing care.

The topic of exercise is similar to the scheduling concept. Exercise activity needs to be inquired about, verbally reinforced and encouraged and problem-solving support from therapists can be really helpful to patients in finding the time and methods for exercise.

ICS 3: Drug Refusal Skills

As many as one-third of individuals who enter treatment for a substance use disorder, resume drug use as a direct result of social pressure from friends who use. Most individuals who use drugs who are trying to quit continue to have some contact, either planned or inadvertent, with friends or acquaintances who are still using. Turning down methamphetamine or cocaine or opportunities to go places where they are available will be much more difficult than most patients anticipate. When initiating drug-refusal training, therapists begin by explaining why this will be important.

For example, "drug refusal training can be very important in helping you achieve an initial period of abstinence and for maintaining that abstinence. We are going to practice ways to refuse drugs or to refuse to go to places where drugs are available. The ability to effectively say "no" in these situations will help you feel in control when faced with situations that are tempting and to which you may previously have said "yes" automatically. If you do not prepare yourself to deal with these situations, good intentions may not lead to effective refusal. An important component of this training is for you to be creative in anticipating many of the situations that may come up in the following months. We have developed some examples that we feel are typical of what many individuals who use stimulants face, but each person has a unique set of circumstances. This training will benefit you most if you include situations relevant to your life so that we can rehearse how to handle them."

Part of this session includes role-playing. The therapist should play the role of the person offering drugs and the patient should play themself. Remind the patient of the important components of effective refusal which are provided on the session handout.

ICS 4: Social Skills/Assertiveness Training

Many people in treatment for drug and alcohol problems have difficulty with interpersonal relations. Poor interpersonal skills can give rise to emotional states such as anger, frustration, resentment, depression, or anxiety and decrease the quality of life and increase the risk of relapse.

Social-skills training is provided to help patients to:

- Meet nondrug-using peers.
- Interact more effectively with coworkers, family members, or roommates.
- Attend social activities that are have normally been avoided.
- Express their feelings or assert themselves in an appropriate way.

The goal: to better handle interpersonal situations; to experience more positive reinforcement and fewer negative, aversive effects. Assertiveness training is particularly appropriate for patients who tend to be either too passive or too aggressive in social situations. Assertiveness training is one method for increasing positive experiences and decreasing negative experiences in social settings.

Explain to the patient: Learning how to be assertive will enable you to act in your own best interest, to stand up for yourself without experiencing excessive anxiety, to express your feelings honestly and comfortably, and to exercise your personal rights without denying the rights of others. Review the "Tips" and discuss each one.

Role play. Ask the patient to act out situations they identify as being non-assertive and provide feedback. It may help to role play first to make the patient more comfortable with the exercise.

ICS 5: Recovery Checklist

This session provides a worksheet for patients to see what proactive things they are doing in their treatment and what aspects of their treatment they need to work on. This is an opportunity for the group members to receive and provide input on dealing with items on the checklist.

ICS 6: Motivation for Recovery

Sometimes the reasons for entering drug treatment do not make a difference in the long-term outcome of treatment. Almost always the motives for starting treatment

have to do with ending or escaping a bad situation (at home, at work, bad health, depression, etc.). With some period of abstinence these reasons resolve, and the question becomes "why stay sober now?" Motivation shifts to experiencing the benefits of a drug-free life. In this session, discuss this issue and pose the questions at the end of the session to each patient to increase their awareness of why they want sobriety now. For newer patients, the motivations typically will not have changed much since beginning treatment.

ICS 7: Managing Anger

Anger is repeatedly defined as an overwhelming negative emotional trigger. The purpose of this session is to provide patients with alternative ways of dealing with anger, to avoid feeling overpowered, and to avoid the strong possibility of drug use.

For many people, substance use is a way to cope with feelings that are uncomfortable. When faced with a troubling emotion, such as anger, people often choose not to cope with it and turn to substance use instead. Patients in recovery no longer can turn to drugs and alcohol for a temporary escape from difficult emotions.

The following steps may help patients better understand and manage their anger:

- Be honest with yourself. Admit when you are experiencing anger.
- Be aware of how your anger shows itself. Physical sensations and patterns of behavior can help you recognize when you are angry.
- Think about how anger affects others. Being aware of anger's effects on those you care about might motivate you to minimize its effects in your life.
- Identify and implement coping strategies. Keep using strategies that have always worked and find new ones that may be useful.

ICS 8: Social/Recreational Counseling

This session focuses on developing interest and participation in recreational and social activities that are pleasurable and do not involve drug use. The goal is to increase participation in social activities that may serve as alternatives drug use.

Therapists should provide a rationale for working on lifestyle changes in social and recreational areas. Many times, when drugs become a regular part of someone's life, they either stop doing many of the nondrug activities they used to enjoy, or they never start or develop any regular recreational activities. Social and recreational activities are important in most people's lives. They provide a source of enjoyment that can be looked forward to after a stressful day, a way to decrease boredom, a way to feel physically healthy, an outlet for developing a skill that makes you feel good about yourself, and a chance to be with people with whom you would like to develop friendships.

The first step in social/recreational counseling is to develop a list of potentially reinforcing activities that the patient is interested in pursuing. Therapists could also use the ***Leisure Interests Checklist*** handout to help. Once possible activities are identified, therapist and patient should attempt to categorize activities by amount of interest, cost, others' involvement, time commitment, likelihood of engaging in the activity, and whether it is physical or sedentary.

The next step is to create a list of persons who might participate in activities with the patient. This can be difficult, because patients will often report that they don't know anyone who abstains from using drugs or alcohol; this is rarely true. With gentle prompting about extended family and old acquaintances, patients can usually name at least one safe person to target as a contact.

If patients are unable to identify anyone, move on and come back to this issue later. Finding safe people has high priority, since establishing a social network of non-using friends or family members can play a substantial role in the achievement and maintenance of abstinence.

ICS 9: Stimulants and Sex – A Natural Connection

This session opens the door on a sensitive and important topic. It gives the patient an opportunity to discuss sexual issues in a safe environment. This topic can sometimes be uncomfortable unless the topic is presented as a natural part of the addiction/recovery process. It is important to maintain a serious tone in this group. Explicit detailing of sexual experiences is not important. The relationship between sex and resumption of drug use should be discussed.

ICS 10: Recovery Checklist

This session provides a worksheet for patients to see what proactive things they are doing in their treatment and what aspects of their treatment they need to work on. This is an opportunity for the group members to receive and provide input on dealing with items on the checklist. This is a repeat of this topic to allow the therapist and patient to see improvements or regression in recovery. The repeated review is akin to checking the recovery vital signs.

ICS 11: Relationship Happiness Scale

The contents of this session can be delivered with the patient's significant other or a supportive family member or close friend or roommate. If the other person is not able to attend the session, the contents can be reviewed with the patient who can go over them at home.

Therapists should next give patients and their partners each a copy of the ***Relationship Happiness Scale*** and ***Examples of Relationship-Related Activities*** and explain the rationale for their use.

The Happiness Scale is used to assess how happy couples are currently with various areas of their lives. Each partner should complete the form independently. Therapists should emphasize that they are to evaluate the problems in terms of current, not past, satisfaction. A list of examples (***Examples of Relationship-Related Activities***) is given to couples to provide them with types of events relevant to each area.

Once completed, therapists should collect the forms and initiate a brief discussion of their responses. Therapists should explain that this happiness scale should be completed periodically to assess changes that occur during treatment.

ICS 12: Continuing Care Plan

Patients should be oriented to viewing the treatment after the initial 12 weeks as a non-optional extension of the intensive treatment period. Attendance in the weekly continuing care group is critical to sustaining the progress achieved. In this session the therapist should review the ***Mooring Lines and Recovery Checklist*** handouts to reinforce continued positives and discuss areas which need more attention. In addition to attendance in the program's continuing care meeting other offsite recovery activities should be identified and planned. Some of these are community support meetings (12-Step, SMART recovery, etc.), regular exercise activities, spiritual activities, counseling, volunteer work, and others. If possible, the therapist should meet the patient at the first continuing care meeting to introduce the patient to the group and reinforce the attendance. If the patient fails to show for the meeting the therapist should call, text, or email the patient to draw them back in.

Chapter 10: Continuing Care Group

The 12-week TRUST program is one way in which evidence-based strategies can be combined into a protocol to organize treatment materials. However, 12-weeks represents an introduction and initial skill building period that can help develop a long-term recovery program. As we have come to recognize substance use disorders as a chronic brain disorder that requires long term guidance and support, it is a mistake to think that completing a 12-week treatment episode is sufficient for meaningful engagement in recovery.

We present the following brief section to help you consider what kinds of ongoing support and treatment materials can be useful to your patients. At minimum, continuing attendance at a weekly session for an extended period is highly recommended if, the progress made in the first 12 weeks is going to be maintained. However, the content of the sessions, needs to be developed to meet the needs of the individuals in your treatment facility and you may need a menu of ongoing services.

We recommend as a minimum, a weekly continuing care group that patients who have completed the 12-week TRUST protocol can advance to for as long as they benefit. It is important to present this group as continuing care, not "aftercare" which implies the treatment is over and this group is optional. Recovery from StimUD takes longer than 12 weeks. Frequently if a treatment service presents an intensive treatment phase followed by "aftercare," patients get the message that "aftercare" is not important, and they discontinue involvement.

The continuing care group provides a safe and intimate therapeutic setting where the norms of the groups have previously been established and patients join already familiar others group members. As a result of the cohesiveness of the group, some patients will come to view it as their "home group."

This groups serves several purposes:

1. It is a support group of peers.
2. It helps prevent a return to drug use.
3. It helps patients stay on the course established in the initial 12-weeks of treatment.
4. It provides accountability of the things in place which are key to recovery (e.g., a review of the mooring lines).
5. It provides accountability for experimenting with new goals and behavioral changes.
6. If there is repeated drug use or a deterioration in the behaviors which had supported abstinence, the group may be instrumental in getting a person into a higher level of care.

If possible, to answer questions and reduce patient anxiety about entering a new group, it is useful for the therapist to meet the patient immediately before the first continuing care meeting to welcome the patient, explain the group and how it is different from earlier group sessions in the TRUST protocol. If the patient fails to show for the meeting the therapist should reach out to the patient (call, text, or email) to reinforce the invitation and show interest in the patient's continuing to receive support.

Start the group with the agenda and expectations followed by introduction of new members who are asked to give a brief account of the challenges and accomplishments over the initial 12 weeks of treatment. Have patients provide a brief check-in covering triggers, cravings and successes. Time can be limited to 3 or 5 minutes per patient depending on the size of the group. It is a good idea to inform patients in the agenda how much time they will have for the check in.

It is useful to have a topic to provide a focus for the session, these topics should be tailored to address issues of importance to be members of the group. There are numerous manuals and websites and training documents listed in the Appendix that provide materials for consideration. The TRUST program organizers can provide suggestions and guidance if requested.

The last quarter of the group can be an open discussion of any relevant problems. By this time, patients should be able to share their support by giving examples of how they have handled similar problem. Remember to remind patients not to give advice unless it is asked for. Telling people what to do generally shuts down the process of the individual sharing and problem-solving.

Attendance in the program's continuing care meeting is frequently done in combination with community support meetings (12-Step, SMART recovery, etc.), regular exercise activities, spiritual activities, counseling, volunteer work, and others.

The following are some sample topics and worksheets that can be useful for continuing care sessions.

Attending Events with a Sober Objective

Sober Objective- It is important to have a sober objective before attending a potentially triggering event. A sober objective is your reason for attending an event other than using drugs or alcohol. The sober objective should include the specific reason I am attending an event and the things I plan to do there.

If I don't have a sober objective, I should not attend the event.

My Plan B- What I will do instead of attending the event if I recognize that the event will be too triggering for me. This way, I will have a pre-planned alternative way to spend that time. It's never too late to choose to use your Plan B (even if you're in the parking lot, ready to walk into the event).

Fill this out with any events between now and our next meeting. Use the example on the next page as a guide.

Event	Sober Objective	Possible Risks	Exit Strategy	Plan B

Example:

Event	Sober Objective	Possible Risks	Exit Strategy	Plan B
The wedding of a friend (I will only stay for the ceremony)	To support the newlyweds, tell them how beautiful they look and compliment the parents on a lovely ceremony.	Alcohol or drugs will be available.	Have my own transportation and leave if the risk occurs.	Go on a hike and picnic with sober friends

APPENDIX: Other Evidence-based Practices/Manuals/Websites

Contingency Management/Motivational Incentives

The CM Manual; A Guide to Instituting Low-Cost Motivational Incentives. Designed by Christine Higgins, Dissemination Specialist, Mid-Atlantic Node of the National Institute on Drug Abuse, Clinical Trials Network

Contingency Management for Healthcare Settings Online Training
https://attcnetwork.org/centers/northwest-attc/cm

Promoting Awareness of Motivational Incentives
https://www.drugabuse.gov/blending-initiative/motivational-incentives-package

Community Reinforcement Approach

Community Reinforcement; Community Reinforcement and Family Training Support and Prevention (CRAFT-SP). Steven M. Scruggs, Robert Meyer and Rebecca Kayo Published by the Department of Veterans Affairs, South Central Mental Illness Research, Education, and Clinical Center (MIRECC), 2001. Last updated 12/15/2014.
https://www.mirecc.va.gov/visn16/docs/CRAFT-SP_Final.pdf

The Community Reinforcement Approach: A Guideline developed for the Behavioral Health Recovery Management Project. Robert J. Meyers and Daniel D. Squires, University of New Mexico Center on Alcoholism, Substance Abuse and Addictions, Albuquerque, New Mexico. The Behavioral Health Recovery Management project is an initiative of Fayette Companies, Peoria, Il; Chestnut Health Systems, Bloomington, Il; and the University of Chicago Center for Psychiatric Rehabilitation. This

project was funded by the Illinois Department of Human Services', Office of Alcoholism and Substance Abuse.

Cognitive Behavioral Therapy

Therapist's Treatment Manual: Matrix Intensive Outpatient Treatment for People With Stimulant Use Disorders. Center for Substance Abuse Treatment. HHS Publication No. (SMA) 13-4152. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2006.
https://store.samhsa.gov/product/Matrix-Intensive-Outpatient-Treatment-for-People-With-Stimulant-Use-Disorders-Therapist-s-Treatment-Manual/SMA13-4152

Anger Management for Substance Use Disorder and Mental Health Clients. A Cognitive-Behavioral Therapy Manual
https://store.samhsa.gov/sites/default/files/d7/priv/anger_management_manual_508_compliant.pdf

Getting Off: A Behavioral Treatment Intervention for Gay and Bisexual Male Methamphetamine Users
Getting Off: A Behavioral Treatment Intervention for Gay and Bisexual Male Methamphetamine Users, A Training Manual for Therapists
www.friendscommunitycenter.org/resources

Motivational Interviewing

Enhancing Motivation for Change in Substance Abuse Treatment (TIP 35) (Substance Abuse and Mental Health Services Administration (SAMHSA) This guide helps clinicians influence the change process in their patients by incorporating motivational interventions into substance use disorder treatment programs.

Research about Motivational Interviewing (PubMed/National Library of Medicine search)

Motivational Interviewing Network of Trainers (MINT)
International non-profit organization of trainers in MI that aims to promote good practice in the use, research, and training of MI. Website includes information on upcoming events/trainings and a "Library" of MI publications, coding and assessment tools, practice tools, and more.

Motivational Interviewing Training and Technical Assistance

https://attcnetwork.org/centers/northwest-attc/motivational-interviewing-mi

MI manuals and other resources are available through UNM at https://casaa.unm.edu/mimanuals.html

Self-paced basic MI training available through the ATTC network at https://healtheknowledge.org/course/search.php?search=tour+of+motivational+interviewing+

Tour of Motivational Interviewing (HealtheKnowledge/ATTC)
4-hour online training that takes the learner on a tour of the essential skills used to strengthen an individual's motivation for behavior change. ***4 hours of CE available!***

Motivational Interviewing CME/CE and Patient Simulations (NIDA-SAMHSA Blending Initiative) Includes: *Talking to Patients about Health Risk Behaviors with MI Patient Simulation* and *Engaging Adolescent Patients About Marijuana Use*

Education on Motivational Interviewing and an opportunity to earn credit
https://healtheknowledge.org/course/index.php?categoryid=53

https://www.drugabuse.gov/blending-initiative/motivational-interviewing-assessment

Other Resources

Substance Abuse and Mental Health Services Administration. Trauma-Informed Care in Behavioral Health Services. Treatment Improvement Protocol (TIP) Series 57. HHS Publication No. (SMA) 13-4801. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

https://store.samhsa.gov/product/TIP-57-Trauma-Informed-Care-in-Behavioral-Health-Services/SMA14-816?referer=from_search_result

Substance Abuse and Mental Health Services Administration. SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach. HHS Publication No. (SMA) 14-4884. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014

https://store.samhsa.gov/product/SAMHSA-s-Concept-of-Trauma-and-Guidance-for-a-Trauma-Informed-Approach/SMA14-4884?referer=from_search_result

HIV Rapid Testing

https://www.drugabuse.gov/blending-initiative/hiv-rapid-testing

Buprenorphine

https://www.drugabuse.gov/blending-initiative/buprenorphine-suite-blending-products

Twelve-step Facilitation

https://pubs.niaaa.nih.gov/publications/projectmatch/match01.pdf

Treatment Planning

https://www.drugabuse.gov/blending-initiative/treatment-planning-matrs

Texas Christian University, Institute of Behavioral Research

Brief interventions, including:

Getting Motivated to Change
Straight Ahead: Transition Skills for Recovery
Understanding and Reducing Angry Feelings
WaySafe; Mapping Your Way to a Healthy Future
Treatment Readiness and Induction Program

https://ibr.tcu.edu/manuals/background-and-overview/

National Institute on Drug Abuse: Principles of Effective Treatment
https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/principles-effective-treatment

Center of Excellence for Integrated Health Solutions. Funded by Substance Abuse and Mental Health Services Administration Operated by the National Council for Behavioral Health
https://www.thenationalcouncil.org/integrated-health-coe/

National Institute on Drug Abuse & Substance Abuse and Mental Health Services Administration Blending Initiative
https://www.drugabuse.gov/nidasamhsa-blending-initiative

Assertive Community Treatment: Getting Started with EBPs. DHHS Pub. No. SMA-08-4344, Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services, 2008.

The California Evidence-Based Clearinghouse for Child Welfare; Information and Resources for Child Welfare Professionals
https://www.cebc4cw.org/program/community-reinforcement-approach/detailed

TIP 33: Treatment for Stimulant Use Disorders: Treatment Improvement Protocol (TIP) Series 33. HHS Publication No. (SMA) 09-4209. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.
http://adaiclearinghouse.net/downloads/TIP-33-Treatment-for-Stimulant-Use-Disorders-61.pdf

Substance Abuse and Mental Health Services Administration. A Guide for Taking Care of Your Family Member After Treatment in the Emergency Department. HHS Publication No. SMA18-4357ENG. Rockville, MD: Center for Mental Health Services, Substance Abuse and

Mental Health Services Administration, U.S. Department of Health and Human Services. Revised 2018.
https://store.samhsa.gov/product/A-Guide-for-Taking-Care-of-Your-Family-Member-After-Treatment-in-the-Emergency-Department/sma18-4357eng?referer=from_search_result

Bibliography

Abel, J. M., Nesil, T., Bakhti-Suroosh, A., Grant, P. A., & Lynch, W. J. (2019). Mechanisms underlying the efficacy of exercise as an intervention for cocaine relapse: A focus on mGlu5 in the dorsal medial prefrontal cortex. Psychopharmacology. June 3. [Epub ahead of print]. https://doi.org/10.1007/s00213-019-05208-0.

Abrantes, A. M., Strong, D. R., Cohn, A., Cameron, A. Y., Greenberg, B. D., Mancebo, M.C., & Brown, R. A. (2009). Acute changes in obsessions and compulsions following moderate-intensity aerobic exercise among patients with obsessive-compulsive disorder. *Journal of Anxiety Disorders, 23*(7), 923927. doi: 10.1016/j.janxdis.2009.06.008

Agosti, E. Nunes, J.W. Stewart, F.M. Quitkin Patient factors leading to early attrition from an outpatient cocaine research clinic: a preliminary report Int. J. Addict., 26 (1991), pp. 327-334 CrossRefView Record in ScopusGoogle ScholarAgosti et al., 1996

Ahmad, F. B., Rossen, L. M., Spencer, M. R., Warner, M., & Sutton, P. (2018). Provisional drug overdose death counts. National Center for Health Statistics. Retrieved November 2018 from: https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

Alia Al-Tayyib, Stephen Koester, Sig Langegger & Lisa Raville (2017) Heroin and Methamphetamine Injection: An Emerging Drug Use Pattern, Substance Use & Misuse, 52:8, 1051-1058, DOI: 10.1080/10826084.2016.1271432

American College of Sports Medicine. (2000). ACSM's guidelines for exercise testing and prescription (6th ed.). Baltimore, MD: Lippincott Williams & Wilkins.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: Author.

Anderson, A. L., Li, S. H., Markova, D., Holmes, T. H., Chiang, N., Kahn, R.,...Roache, J. D. (2015). Bupropion for the treatment of methamphetamine dependence in non-daily users: a randomized, double-blind, placebo-controlled trial. Drug and Alcohol Dependence, 150, 170-174. PMCID: PMC4388163

Anderson, A. L., Reid, M. S., Li, S. H., Holmes, T., Shemanski, L., Slee, A.,... & Ciraulo, D. (2009). Modafinil for the treatment of cocaine dependence. Drug and Alcohol Dependence, 104(1-2), 133-139. PMCID: PMC2818032

Anderson, A.L., Li, S.-H., Biswas, K., McSherry, F., Holmes, T., Iturriaga, E., Kahn, R., Chiang, N., Beresford, T., Campbell, J., Haning, W., Mawhinney, J., McCann, M., Rawson, R., Stock, C., Weis, D., Yu, E., & Elkashef, A.M. (2012). Modafinil for the treatment of methamphetamine dependence. *Drug and Alcohol Dependence, 120*(1-3), 135-141. PMCID: PMC3227772

Angelucci, F., Ricci, V., Pomponi, M., Conte, G., Mathe, A. A., Tonali, P. A., & Bria, P. (2007). Chronic heroin and cocaine abuse is associated with decreased serum concentrations of the nerve growth factor and brain-derived neurotrophic factor. *Journal of Psychopharmacology, 21*(8), 820–825. doi: https://doi.org/10.1177/0269881107078491

Angevaren, M., Aufdemkampe, G., Verhaar, H. J., Aleman, A., & Vanhees, L. (2008). Physical activity and enhanced fitness to improve cognitive function in older people without known cognitive impairment. *Cochrane Database of Systematic Reviews, July 16*(3), CD005381. doi: 0.1002/14651858.CD005381.pub3.

Anglin, M.D., & Rawson, R.A. (2000). The CSAT Methamphetamine Treatment Project: What are we trying to accomplish? *Journal of Psychoactive Drugs, 32,* 209-210.

Anglin, M.D., & Rawson, R.A. (Eds.) (2000). The CSAT Methamphetamine Treatment Project: Moving research into the "real world." *Journal of Psychoactive Drugs, 32*(2), 135-136.

Anglin, M.D., Urada, D., Brecht, M.L., Hawken, A., Rawson, R., & Longshore, D. (2007). Criminal justice treatment admissions for methamphetamine use in California: A focus on Proposition 36. *Journal of Psychoactive Drugs, Suppl. 4*, 367-381.

Arch. Gen. Psychiat., 56 (1999), pp. 505-506

AshaRani P, Hombali A, Seow E, Jie W, Ong, Tan JH, Subramaniam M, Non-pharmacological interventions for methamphetamine use disorder: a systematic review, Drug and Alcohol Dependence (2020), doi:https://doi.org/10.1016/j.drugalcdep.2020.108060

Bahrke, M., & Morgan, W. (1978). Anxiety reduction following exercise and meditation. *Cognitive Therapy and Research, 2*(4), 323–333. doi:10.1007/BF01172650

Baldaçara, L., Cogo-Moreira, H., Parreira, B. L., Diniz, T. A., Milhomem, J. J., Fernandes, C. C., & Lacerda, AL. (2016). Efficacy of topiramate in the treatment of cocaine dependence: A double-blind, randomized, placebo-controlled trial. The Journal of Clinical Psychiatry, 77(3), 398-406. PMID: 27046312

Ballester, J., Valentine, G., & Sofuoglu, M. (2017). Pharmacological treatments for methamphetamine addiction: Current status and future directions. Expert Review of Clinical Pharmacology, 10(3), 305-314. PMID: 27927042

Barbour, K. A., Edenfield, T. M., & Blumenthal, J. A. (2007). Exercise as a treatment for depression and other psychiatric disorders: A review. *Journal of Cardiopulmonary Rehabilitation and Prevention, 27*(6), 359–367. doi: 10.1097/01.HCR.0000300262.69645.95.

Bechara, A., & Damasio, H. (2002). Decision-making and addiction (part I): Impaired activation of somatic states in substance dependent individuals when pondering decisions with negative future consequences. *Neuropsychologia, 40*(10), 1675–1689. doi: https://doi.org/10.1016/S0028-3932(02)00015-5
Blumenthal, J. A., Williams, R. S., Wallace, A. G., Williams, R. B. Jr, & Needles, T. L. (1982). Physiological and psychological variables predict compliance to prescribed exercise therapy in patients recovering from myocardial infarction. *Psychosomatic Medicine, 44*(6), 519–527. doi: https://insights.ovid.com/pubmed?pmid=7163455

Blumenthal, J., Babyak, M., Moore, K., Craighead, W. E., Herman, S., Khatri, P.,…Krishnan, K. R. (1999). Effects of exercise training on older patients with major depression. *Archives of Internal Medicine, 159*(19), 2349–2356. doi:10.1001/archinte.159.19.2349

Bock, B. C., Marcus, B. H., King, T., Borrelli, B., & Roberts, M. R. (1999). Exercise effects on withdrawal and mood among women attempting smoking cessation. *Addictive Behaviors, 24*(3), 399–410. doi:https://doi.org/10.1016/S0306-4603(98)00088-4

Bostwick MJ and Lineberry TW, 2006. The 'meth' epidemic: managing acute psychosis, agitation, and suicide risk. *The Journal of Family Practice* 5(11):

Breslin, F. C., Zack, M., & McMain, S. (2002). An information-processing analysis of mindfulness: Implications for relapse prevention in the treatment of substance abuse. *Clinical Psychology: Science and Practice, 9*(3), 275–299. doi: http://dx.doi.org/10.1093/clipsy/9.3.275

Brewer, J. A., Sinha, R., Chen, J. A., Michalsen, R. N., Babuscio, T. A., Nich, C.,…Rounsaville, B. J. (2009). Mindfulness training and stress reactivity in substance abuse: Results from a randomized, controlled stage I pilot study. Substance Abuse, 30(4), 306–317. doi:10.1080/08897070903250241 PMCID: PMC3045038

Broocks, A., Bandelow, B., Pekrun, G., George, A., Meyer, T., Bartmann, U.,…Rüther, E. (1998). Comparison of aerobic exercise, clomipramine, and placebo in the treatment of panic disorder. *American Journal of Psychiatry, 155*(5), 603–609. doi: https://doi.org/10.1176/ajp.155.5.603

Brown, A.H., Domier, C., & Rawson, R. (2005). Stimulants, sex, and gender. *Sexual Addiction and Compulsivity, 12*, 169-180.

Brown, R. A., Abrantes, A. M., Read, J. P., Marcus, B. H., Jakicic, J., Strong, D. R.,…Gordon, A. A. (2010). A pilot study of aerobic exercise as an adjunctive treatment for drug dependence. *Mental Health and Physical Activity, 3*(1), 27–34. doi:10.1016/j.mhpa.2010.03.001

Buchowski, M. S., Meade, N. N., Charboneau, E., Park, S., Dietrich, M. S., Cowan, R. L., & Martin, P. R. (2011). Aerobic exercise training reduces cannabis craving and use in nontreatment seeking cannabis-dependent adults. *PLoS ONE, 6*(3), e17465. doi: 10.1371/journal.pone.0017465.

Budney, A. J., & Higgins, S. T. (1998). Therapy manual for drug addiction manual 2: A community reinforcement plus vouchers approach: Treating cocaine addiction. [PDF File]. Rockville, Maryland: National Institute on Drug Abuse. Retrieved November 2018 from: https://www.ncjrs.gov/App/Publications/abstract.aspx?ID=180293

Cacciola, J. S., Alterman, A. I., Rutherford, M. J., McKay, J. R., & Mulvaney, F. D. (2001). The relationship of psychiatric comorbidity to treatment outcomes in methadone maintained patients. *Drug and Alcohol Dependence, 61*(3), 271–280. doi: https://doi.org/10.1016/S0376-8716(00)00148-4

Carrico AW, Horvath KJ, Grov C, Moskowitz JT, Pahwa S, Pallikkuth S,

Carroll, K. M. (1998). Therapy manuals for drug addiction, manual 1: A cognitive-behavioral approach: Treating cocaine addiction [PDF File]. Rockville, Maryland: National Institute on Drug Abuse. Retrieved November 2018 from: https://archives.drugabuse.gov/sites/default/files/cbt.pdf

Carroll, K. M., Ball, S. A., Martino, S., Nich, C., Babuscio, T. A., Nuro, K. F.,...Rounsaville, B. J. (2008). Computer-assisted delivery of cognitive-behavioral therapy for addiction: A randomized trial of CBT4CBT. American Journal of Psychiatry, 165(7), 881-888. PMCID: PMC2562873

Carroll, K. M., Fenton, L. R., Ball, S. A., Nich, C., Frankforter, T. L., Shi, J., & Rounsaville, B. J. (2004). Efficacy of disulfiram and cognitive behavior therapy in cocaine-dependent outpatients: A randomized placebo-controlled trial. Archives of General Psychiatry, 61(3), 264-272. PMCID: PMC3675448

Carroll, K. M., Kiluk, B. D., Nich, C., Gordon, M. A., Portnoy, G. A., Marino, D. R., & Ball, S. A. (2014). Computer-assisted delivery of cognitive-behavioral therapy: Efficacy and durability of CBT4CBT among cocaine-dependent individuals maintained on methadone. American Journal of Psychiatry, 71(4), 436-444. doi: 10.1176/appi.ajp.2013.13070987.

Carroll, K. M., Nich, C., Ball, S. A., McCance, E., & Rounsaville, B. J. (1998). Treatment of cocaine and alcohol dependence with psychotherapy and disulfiram. Addiction, 93(5), 713-727. PMID: 9692270

Carroll, K. M., Nich, C., Ball, S. A., McCance, E., Frankforter, T. L., & Rounsaville, B. J. (2000). One-year follow-up of disulfiram and psychotherapy for cocaine-alcohol users: Sustained effects of treatment. Addiction, 95(9), 1335-1349. PMID: 11048353

Carroll, K. M., Nich, C., Shi, M., Eagan, D., & Ball, SA. (2012). Efficacy of disulfiram and Twelve Step Facilitation in cocaine-dependent individuals maintained on methadone: a randomized placebo-controlled trial. Drug and Alcohol Dependence, 126(1-2), 224-231. PMCID: PMC3461119

Carroll, K. M., Rounsaville, B. J., Gordon, L. T., Nich, C., Jatlow P., Bisighini R. M., & Gawin F. H. (1994). Psychotherapy and pharmacotherapy for ambulatory cocaine abusers. Archives of General Psychiatry 51, 177-187. PMID: 8122955

Carroll, K. M., Rounsaville, B. J., Nich, C., Gordon, L. T., Wirtz, P. W., & Gawin, F. (1994). One-year follow-up of psychotherapy and pharmacotherapy for cocaine

dependence: Delayed emergence of psychotherapy effects. Archives of General Psychiatry, 51(12), 989-997. PMID: 7979888

Carroll, K.M., & Rawson, R.A. (2005). Relapse prevention approaches for stimulant dependent individuals. In G.A. Marlatt & D. Donovan (Eds.), *Relapse prevention approaches for the treatment of substance use disorders*. New York: Guilford.

Carroll, KM Old psychotherapies for cocaine dependence revised Arch. Gen. Psychiat., 56 (1999), pp. 505-506

Castellis, X., Cunill, R., Pérez-Mañá, C., Vidal, X., & Capellà, D. (2016). Psychostimulant drugs for cocaine dependence. Cochrane Database Systematic Reviews, (9). PMCID: PMC6457633

Center for Substance Abuse Treatment. Therapist's Treatment Manual: Matrix Intensive Outpatient Treatment for People With Stimulant Use Disorders. HHS Publication No. (SMA) 13-4152. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2006.

Centers for Disease Control (CDC) and Prevention, National Center for Health Statistics. (2018). Drug overdose deaths, 2015-2017. Retrieved November 2018 from: https://www.cdc.gov/drugoverdose/data/statedeaths.html

Chan, B., Kondo, K., Ayers, C., Freeman, M., Montgomery, J., Paynter, R., & Kansagara, D. (2018). Pharmacotherapy for stimulant use disorders: A systematic review of the evidence. Washington, DC: Veterans Affairs ESP Project #05-225; 2018.

Chang, Y. K., Tsai, C. L., Huang, C. C., Wang, C. C., & Chu, I. H. (2014). Effects of acute resistance exercise on cognition in late middle-aged adults: General or specific cognitive improvement? *Journal of Science and Medicine in Sport, 17*(1), 51–55. doi: 10.1016/j.jsams.2013.02.007.

Chawarski MC, Hawk K, Edelman EJ, O'Connor P, Owens P, Martel S, Coupet E Jr, Whiteside L, Tsui JI, Rothman R, Cowan E, Richardson L, Lyons MS, Fiellin DA, D'Onofrio G. Use of Amphetamine-Type Stimulants Among Emergency Department Patients With Untreated Opioid Use Disorder. Ann Emerg Med. 2020 Aug 8:S0196-0644(20)30508-4. doi: 10.1016/j.annemergmed.2020.06.046. Epub ahead of print. PMID: 32782084.

Chen CK, Lin SK, Sham PC, Ball D, Loh EW, Hsiao CC, Chiang YL, Ree SC, Lee CH, Murray RM, 2003. Pre-morbid characteristics and co-morbidity of methamphetamine users with and without psychosis. *Psychol Med 33*(8):1407-14.

Chiesa, A., & Serretti, A. (2014). Are mindfulness-based interventions effective for substance use disorders? A systematic review of the evidence. Substance Use & Misuse, 49(5), 492-512, DOI: 10.3109/10826084.2013.770027 PMID: 23461667

Childress, AR, Mozley, PD, McElgin, W, Fitzgerald, J, Reivich, M. and O'Brien, CP.M.D (1999), Limbic activation during cue-induced cocaine craving. American Journal of Psychiatry 156, 11-18

Colcombe, S. J., & Kramer, A. F. (2003). Fitness effects on the cognitive function of older adults: A meta-analytic study. *Psychological Science, 14*(2), 125e130. doi: https://doi.org/10.1111/1467-9280.t01-1-01430

Colfax, G. N., Santos, G. M., Das, M., Santos, D. M., Matheson, T., Gasper, J.,...Vittinghoff, E. (2011). Mirtazapine to reduce methamphetamine use: A randomized controlled trial. Archives of General Psychiatry, 68(11), 1168-1175. PMCID: PMC3437988

Collingwood, T. R., Reynolds, R., Kohl, H. W., Smith, W., & Sloan, S. (1991). Physical fitness effects on substance abuse risk factors and use patterns. *Journal of Drug Education, 21*(1), 73–84. doi: https://doi.org/10.2190/HV5J-4EYN-GPP7-Y3QG

Cooper, C. B. (2001). Exercise in chronic pulmonary disease: Aerobic exercise prescription. *Medicine and Science in Sports and Exercise, 33*(Suppl. 7), S671–S679. doi: https://insights.ovid.com/pubmed?pmid=11462076
Copeland AL, Sorensen JL, 2001. Differences between methamphetamine users and cocaine users in treatment. *Drug Alcohol Depend 62*(1):91-5.

Craft, L. L., & Landers, D. M. (1998). The effect of exercise on clinical depression and depression resulting from mental illness: A meta-analysis. *Journal of Sport and Exercise Psychology, 20*, 339–357. doi: https://doi.org/10.1123/jsep.20.4.339

Crevecoeur, D., Rutkowski, B., & Rawson, R. (2007). The rise in treatment admissions for methamphetamine use in Los Angeles County from 2001 through 2005. *Journal of Psychoactive Drugs, SARC Supplement 4*, 383-392.]

Curtis EK, 2006. Meth mouth: a review of methamphetamine abuse and its oral manifestations. *Gen Dent 54*(2): 125-9.

Dackis, C. A., Kampman, K. M., Lynch, K. G., Pettinati, H. M., & O'Brien, C. P. (2005). A double-blind, placebo-controlled trial of modafinil for cocaine dependence. Neuropsychopharmacology, 30(1), 205. PMID: 15525998

Dackis, C. A., Kampman, K. M., Lynch, K. G., Plebani, J. G., Pettinati, H. M., Sparkman, T., & O'Brien, C. P. (2012). A double-blind, placebo-controlled trial of modafinil for cocaine dependence. Journal of substance Abuse Treatment, 43(3), 303-312. PMCID: PMC3378797

Dakwar, E., & Levin, F. R. (2013). Individual mindfulness-based psychotherapy for cannabis or cocaine dependence: A pilot feasibility trial. American Journal on Addictions, 22(6), 521–526. doi:10.1111/j.1521-0391.2013.12036.x PMCID: PMC4076045

Davidson C, Gow AJ, Lee TH, Ellinwood EH, 2001. Methamphetamine neurotoxicity: necrotic and apoptotic mechanisms and relevance to human abuse and treatment. *Brain Res Rev 36(*1):1-22.

Davis, P. E., Liddiard, H., & McMillan, T. M. (2002). Neuropsychological deficits and opiate abuse. *Drug and Alcohol Dependence, 67*(1), 105–108. doi: https://doi.org/10.1016/S0376-8716(02)00012-1

de Cid, R., Fonseca, F., Gratacos, M., Gutierrez, F., Martin-Santos, R., Estivill, X., & Torrens, M. (2008). BDNF variability in opioid addicts and response to methadone treatment: Preliminary findings. *Genes, Brain, and Behavior, 7*(5), 515–522. doi: 10.1111/j.1601-183X.2007.00386.x.

De Crescenzo, F., Ciabattini, M., D'Alò, GL., De Giorgi, R., Del Giovane, C.,...Cipriani, A. (2018). Comparative efficacy and acceptability of psychosocial interventions for individuals with cocaine and amphetamine addiction: A systematic review and network meta-analysis. PLoS Medicine 15(12), e1002715. PMCID: PMC6306153

Dean, AC, Groman, SM, Morales, AM (2013) An evaluation of the evidence that methamphetamine abuse causes cognitive decline in humans Neuropsychopharmacology, 38, 259-274

DePhilippis, D., Petry, N. M., Bonn-Miller, M. O., Rosenbach, S. B., & McKay, J. R. (2018). The national implementation of contingency management (CM) in the Department of Veterans Affairs: Attendance at CM sessions and substance use outcomes. Drug and Alcohol Dependence, 185:367-373. PMCID: PMC6435332.

Dolezal, B. A., Chudzynski, J., Dickerson, D., Mooney, L., Rawson, R. A., Garfinkel, A., & Cooper, C. B. (2014). Exercise training improves heart rate variability after methamphetamine dependency. *Medicine and Science in Sports and Exercise 46*(6), 1057-1066. doi: 10.1249/MSS.0000000000000201.

Dolezal, B. A., Chudzynski, J., Storer, T. W., Abrazado, M., Penate, J., Mooney, L.,…Cooper, C. B. (2013). Eight weeks of exercise training improves fitness measures in methamphetamine-dependent individuals in residential treatment. *Journal of Addiction Medicine, 7*(2), 122-128. doi: 10.1097/ADM.0b013e318282475e.

Dolezal, B.A., Chudzynski, J., Dickerson, D., Mooney, L., Rawson, R.A., Garfinkel, A., Cooper, C.B. (2014). Exercise training improves heart rate variability after methamphetamine dependency. *Medicine and Science in Sports and Exercise, 46*(6), 1057-1066. PMCID: PMC3999306

Dolezal, B.A., Chudzynski, J., Storer, T.W., Abrazado, M., Penate, J., Mooney, L., Dickerson, D., Rawson, R.A., & Cooper, C.B. (2013). Eight weeks of exercise training improves fitness measures in methamphetamine-dependent individuals in residential treatment. *Journal of Addiction Medicine, 7*(2), 122-128. PMCID: PMC3617407

Domier, C.P., Simon, S.L., Rawson, R.A., Huber, A., & Ling, W. (2000). A comparison of injecting non-injecting methamphetamine users. *Journal of Psychoactive Drugs, 32,* 229-232.

Donovan, D. M., Daley, D. C., Brigham, G. S., Hodgkins, C. C., Perl, H. I., Garrett, S. B.,…Zammarelli, L. (2013). Stimulant abuser groups to engage in 12-Step: A multisite trial in the National Institute on Drug Abuse Clinical Trials Network. Journal of Substance Abuse Treatment, 44(1), 103-114. PMCID: PMC3434261

Durmuş, D., Alayli, G., Uzun, O., Tander, B., Cantürk, F., Bek, Y., & Erkan, L. (2009). Effects of two exercise interventions on pulmonary functions in the patients with ankylosing spondylitis. *Joint, Bone, Spine, 76*(2), 150–155. doi: 10.1016/j.jbspin.2008.06.013. Epub 2008 Dec 11.

Dutra, L., Stathopoulou, G., Basden, S. L., Leyro, T. M., Powers, M. B., & Otto, M. W. (2008). A meta-analytic review of psychosocial interventions for substance use disorders. American Journal of Psychiatry, 165, 179–187.

Elkashef, A. M., Rawson, R. A., Anderson, A. L., Li, S. H., Holmes, T., Smith, E. V., ... & Pearce, V. J. (2008). Bupropion for the treatment of methamphetamine dependence. Neuropsychopharmacology, 33(5), 1162. PMID: 17581531

Elkashef, A., Kahn, R., Yu, E., Iturriaga, E., Li, S.-H., Anderson, A., Chiang, N., Ait-Daoud, N., Weiss, D., McSherry, F., Serpi, T., Rawson, R., Hrymoc, M., Weis, D., McCann, M., Pham, T., Stock, C., Dickinson, R., Campbell, J., Gorodetzky, C., Haning, W., Carlton, B., Mawhinney, J., Li, M.D., & Johnson, B.A. (2012). Topiramate for the treatment of methamphetamine addiction: A multi-center placebo-controlled trial. *Addiction, 107*(7), 1297-1306. PMCID: PMC3331916

Elkashef, A., Rawson R.A., Smith, E., Pearce, V., Flammino, F., Campbell, J., Donovick, R. Gorodetsky, C., Haning, W., Mahwinney, J., McCann, M., Weis, D., Williams, L., Ling, W., & Vocci, F. (2007). The NIDA Methamphetamine Clinical Trials Group: A strategy to increase clinical trials research capacity. *Addiction, 102*, 107-113.

Elkashef, A.M., Rawson, R.A., Anderson, A.L., Li, S.-H., Holmes, T., Smith, E.V., Chiang, N., Kahn, R., Vocci, F., Ling, W., Pearce, V.J., McCann, M., Campbell, J., Gorodetzky, C., Haning, W., Carlton, B., Mawhinney, J., & Weis, D. (2007). Buproprion for the treatment of methamphetamine dependence. *Neuropsychopharmacology*, *33*(5), 1162-1170.

Ellis MS, Kasper ZA, Cicero TJ. Twin epidemics: The surging rise of methamphetamine use in chronic opioid users. Drug Alcohol Depend. 2018 Dec 1;193:14-20. doi: 10.1016/j.drugalcdep.2018.08.029. Epub 2018 Oct 10. PMID:30326396.

Etnier, J. L., Nowell, P. M., Landers, D. M., & Sibley, B. A. (2006). A meta-regression to examine the relationship between aerobic fitness and cognitive performance. *Brain Research Reviews, 52*(1), 119–130. doi:10.1016/j.brainresrev.2006.01.002

Farabee, D., Cousins, S.J., Brecht, M.-L., Antonini, V.P., Lee, A.B., Brummer, J., Hemberg, J., Karno, M., & Rawson, R.A. (2012). A comparison of four telephone-based counseling styles for recovering stimulant users. *Psychology of Addictive Behavior, 27*, 223-229. PMCID: PMC3500433

Farabee, D., Rawson, R.A., & McCann, M. (2002). Adoption of drug avoidance activities among patients in contingency management and cognitive-behavioral treatments. *Journal of Substance Abuse Treatment, 23*, 343-350.

Farrell, M., Martin, N. K., Stockings, E., B□ez, A., Cepeda, J. A., Degenhardt, L., Ali, R., Tran, L.T., Rehm, J., Torrens, M., Shoptaw, S., 2019. Responding to global stimulant use: challenges and opportunities. Lancet. 394, 1652-1667. doi: 10.1016/S0140 6736(19)32230-5.

Feb 1;207:107826. doi: 10.1016/j.drugalcdep.2019.107826. Epub 2019 Dec 23. PMID:31927159.

Fitzpatrick RE, Rubenis AJ, Lubman DI, Verdejo-Garcia A. Cognitive deficits in methamphetamine addiction: Independent contributions of dependence and intelligence. Drug Alcohol Depend. 2020 Apr 1;209:107891. doi: 10.1016/j.drugalcdep.2020.107891. Epub 2020 Feb 5. PMID: 32061948.

Foulds JA, Boden JM, McKetin R, Newton-Howes G. Methamphetamine use and violence: Findings from a longitudinal birth cohort. Drug Alcohol Depend. 2020

Fox, H. C., Bergquist, K. L., Hong, K. I., & Sinha, R. (2007), Stress-induced and alcohol cue-induced craving in recently abstinent alcohol-dependent individuals. *Alcoholism, Clinical and Experimental Research, 31*(3), 395–403. doi:10.1111/j.1530-0277.2006.00320.x

Fremont, J., & Craighead, L. W. (1987). Aerobic exercise and cognitive therapy in the treatment of dysphoric moods. *Cognitive Therapy and Research, 11*, 241–251. doi:10.1007/BF01183268

Galloway, G. P., Buscemi, R., Coyle, J. R., Flower, K., Siegrist, J. D., Fiske, L. A., ... & Mendelson, J. (2011). A randomized, placebo-controlled trial of sustained-release dextroamphetamine for treatment of methamphetamine addiction. Clinical Pharmacology & Therapeutics, 89(2), 276–282. PMCID: PMC3514554

Galloway, G.P., Singleton, E.G., Buscemi, R., Baggott, M.J., Dickerhoof, R.M., Mendelson, J.E.; Methamphetamine Treatment Project Corporate Authors. (2010). An examination of drug craving over time in abstinent methamphetamine users. *American Journal on Addictions, 19*(6), 510-514. doi: 10.1111/j.1521-0391.2010.00082.x. PubMed PMID: 20958846. NIHMS228815

Garland, E., & Howard, M. O. (2018). Mindfulness-based treatment of addiction: Current state of the field and envisioning the next wave of research. Addiction Science and Clinical Practice, 13, 14. PMCID: PMC5907295

Geneen, L. J., Moore, R. A., Clarke, C., Martin, D., Colvin, L. A., & Smith, B. H. (2017). Physical activity and exercise for chronic pain in adults: An overview of

Cochrane Reviews. *Cochrane Database of Systematic Reviews, Jan. 14; 4*, CD011279. doi: 10.1002/14651858.CD011279.pub2.

George, T. P., Chawarski, M. C., Pakes, J., Carroll, K. M., Kosten, T. R., & Schottenfeld, R. S. (2000). Disulfiram versus placebo for cocaine dependence in buprenorphine-maintained subjects: A preliminary trial. Biological Psychiatry, 47(12), 1080-1086. PMID: 10862808

Gerra, G., Fantoma, A., & Zaimovic, A. (2006). Naltrexone and buprenorphine combination in the treatment of opioid dependence. Journal of Psychopharmacology, 20(6), 806–814. PMID: 16401652

Glasner-Edwards S, Marinelli-Casey P, Hillhouse M, Gonzales R, Ang A., Marcu F, Rawson RA, 2007. Psychiatric illness as a predictor of post-treatment methamphetamine use. Paper presented at the 69th annual meeting of the College on Problems of Drug Dependence (Quebec City, Canada).

Glasner-Edwards, S., Hartwell, E.E., Mooney, L., Ang, A., Garneau, H.C., Brecht, M.-L., & Rawson, R.A. (2016). Changes in stress reactivity among stimulant dependent adults after treatment with mindfulness based relapse prevention: Results from a pilot randomized clinical trial. *Journal of Addiction Research & Therapy, 7*:298. doi:10.4172/2155-6105.1000298

Glasner-Edwards, S., Marinelli-Casey, P., Hillhouse, M., Ang, A., Mooney, L.J., & Rawson, R.; Methamphetamine Treatment Project Corporate Authors. (2009). Depression among methamphetamine users: Association with outcomes from the Methamphetamine Treatment Project at 3-year follow-up. *Journal of Nervous and Mental Disease, 197*(4), 225-231. PMCID: PMC2749575

Glasner-Edwards, S., Mooney, L. J., Marinelli-Casey, P., Hillhouse, M., Ang, A., & Rawson, R. A.; the Methamphetemine Treatment Project Corporate Authors. (2009). Psychopathology in methamphetamine dependent adults 3 years after treatment. *Drug and Alcohol Review, 29*, 12–20. doi: https://doi.org/10.1111/j.1465-3362.2009.00081.x

Glasner-Edwards, S., Mooney, L. J., Marinelli-Casey, P., Hillhouse, M., Ang, A., Rawson, R.; the Methamphetamine Treatment Project Corporate Authors. (2008). Identifying methamphetamine users at risk for major depressive disorder: Findings from the Methamphetamine Treatment Project at three-year follow-up. *American Journal on Addictions, 17*(2), 99–102. doi: 10.1080/10550490701861110.

Glasner-Edwards, S., Mooney, L., Ang, A., Hillhouse, M., & Rawson, R. (2013). Does posttraumatic stress disorder (PTSD) affect post-treatment methamphetamine use? *Journal of Dual Diagnosis, 9*(2), 123-128. doi:10.1080/15504263.2013.779157 PMCID: PMC3779468

Glasner-Edwards, S., Mooney, L., Ang., A., Garneau, H.C., Hartwell, E.E., Brecht, M.-L., Rawson, R.A. (2015). Mindfulness based relapse prevention improves stimulant use among adults with major depression and generalized anxiety disorder. *Drug and Alcohol Dependence, 156*, e80. doi: http://dx.doi.org/10.1016/j.drugalcdep.2015.07.1135

Glasner-Edwards, S., Mooney, L.J., Ang, A., Garneau, H.C., Hartwell, E., Brecht, M.-L., & Rawson, R. A. (2017). Mindfulness based relapse prevention for stimulant dependent adults: A pilot randomized clinical trial. *Mindfulness, 8*(1), 126-135. doi:10.1007/s12671-016-0586-9. PMCID: PMC5300086 (Available Feb. 1, 2018).

Glasner-Edwards, S., Mooney, L.J., Marinelli-Casey, P., Hillhouse, M., Ang, A., & Rawson, R.; the Methamphetamine Treatment Project Corporate Authors. (2008). Identifying methamphetamine users at risk for major depressive disorder: Findings from the Methamphetamine Treatment Project at three-year follow-up. *American Journal on Addictions, 17*(2), 99-102. PMID: 18393051

Glasner-Edwards, S., Mooney, L.J., Marinelli-Casey, P., Hillhouse, M., Ang, A., & Rawson, R., the Methamphetamine Treatment Project Corporate Authors. (2008). Risk factors for suicide attempts in methamphetamine-dependent patients. *American Journal on Addictions, 17*(1), 24-27. PMID: 18214719

Glasner-Edwards, S., Mooney, L.J., Marinelli-Casey, P., Hillhouse, M., Ang, A., Rawson, R.; the Methamphetamine Treatment Project Corporate Authors. (2008). Clinical course and outcomes of methamphetamine-dependent adults with psychosis. *Journal of Substance Abuse Treatment*, *35*(4), 445-450. PMID: 18294802

Glasner-Edwards, S., Mooney, L.J., Marinelli-Casey, P., Hillhouse, M., Ang, A., Rawson, R.A., & the Methamphetamine Treatment Project Corporate Authors. (2009). Psychopathology in methamphetamine-dependent adults 3 years after treatment. *Drug and Alcohol Review, 29*, 12-20. PMID: 20078677 NIHMSID 475182

Glasner-Edwards, S., Mooney, L.J., Marinelli-Casey, P., Hillhouse, M., Ang, A., & Rawson, R.; Methamphetamine Treatment Project Corporate Authors. (2010). Anxiety disorders among methamphetamine dependent adults: Association with post-treatment functioning. *American Journal on Addictions, 19*(5), 385-390. PMCID: PMC3159418

Glasner-Edwards, S., Mooney, L.J., Marinelli-Casey, P., Hillhouse, M., Ang, A., & Rawson, R.A. (2011). Bulimia nervosa among methamphetamine dependent adults: Association with outcomes three years after treatment. *Eating Disorders: The Journal of Treatment and Prevention, 19*(3), 259-269. PMCID: 3159413

Gonzales, R., Ang, A., Glik, D.C., Rawson, R.A., Lee, S., Iguchi, M.Y.; Methamphetamine Treatment Project Corporate Authors. (2011). Quality of life among treatment seeking methamphetamine-dependent individuals. *The American Journal on Addictions, 20*(4), 366-372. PMCID: PMC4026308

Gonzales, R., Ang, A., Marinelli-Casey, P., Glik, D.C., Iguchi, M.Y., & Rawson, R.A.; Methamphetamine Treatment Project Corporate Authors. (2009). Health-related quality of life trajectories of methamphetamine-dependent individuals as a function of treatment completion and continued care over a 1-year period. *Journal of Substance Abuse Treatment*, 37(4), 353-361. PMID: 19553066

Gonzales, R., Ang, A., McCann, M., & Rawson, R. (2008). An emerging problem: Methamphetamine use among treatment seeking youth. *Substance Abuse, 29*(2), 71-80. PMID: 19042326

Gonzales, R., Mooney, L., & Rawson, R.A. (2010). The methamphetamine problem in the United States. *Annual Review of Public Health, 31*, 6.1-6.14. PMCID: PMC4440680

Gonzales, R.G., Marinelli-Casey, P.M., Shoptaw, S., Ang, A., & Rawson, R.A. (2006). Hepatitis C virus infection among methamphetamine dependent individuals in outpatient treatment. *Journal of Substance Abuse Treatment, 31*, 195-202.

Gonzalez Castro, F., Barrington, E.H., Walton, M.A. & Rawson, R.A. (2000). Cocaine and methamphetamine: Differential addiction rates. *Psychology of Addictive Behaviors, 14(4)*, 390-396.

Gonzalez, R., Rippeth, J. D., Carey, C. L., Heaton, R. K., Moore, D. J., Schweinsburg, B. C.,…Grant, I. (2004). Neurocognitive performance of

methamphetamine users discordant for history of marijuana exposure. *Drug and Alcohol Dependence, 76*(2), 181–190. doi:10.1016/j.drugalcdep.2004.04.014

Greist, J. H., Klein, M. H., Eischens, R. R., Faris, J., Gurman, A. S., & Morgan, W. P. (1979). Running as treatment for depression. *Comprehensive Psychiatry, 20*, 41–54. doi: https://doi.org/10.1016/0010-440X(79)90058-0

Haglund, M., Ang, A., Mooney, L., Gonzales, R., Chudzynski, J., Cooper, C.B., Dolezal, B.A., Gitlin, M., & Rawson, R.A. (2015). Predictors of depression outcomes among abstinent methamphetamine-dependent individuals exposed to an exercise treatment. *American Journal on Addictions, 24*(3), 246-251. doi: 10.1111/ajad.12175.

Haglund, M., Ang, A., Mooney, L., Gonzales, R., Chudzynski, J., Cooper, C.B., Dolezal, B.A., Gitlin, M., & Rawson, R.A. (2015). Predictors of depression outcomes among abstinent methamphetamine-dependent individuals exposed to an exercise treatment. *American Journal on Addictions, 24*(3), 246-251. doi: 10.1111/ajad.12175.

Haglund, M., Ang, A., Mooney, L., Gonzalez, R., Chudzynski, J., Cooper, C. B., & Rawson, R. A. (2015). Predictors of depression outcomes among abstinent methamphetamine-dependent individuals exposed to an exercise intervention. *American Journal of Addictions, 24*(3), 246–251. doi: 10.1111/ajad.12175.

Hallgren, M., Vancampfort, D., Giesen, E. S., Lundin, A., & Stubbs, B. (2017). Exercise as treatment for alcohol use disorders: Systematic review and meta-analysis. *British Journal of Sports Medicine, 51*(14), 1058–1064. doi: 10.1136/bjsports-2016-096814. Epub 2017 Jan 13.

Häuser, W., Klose, P., Langhorst, J, Moradi, B, Steinbach, M, Schiltenwolf, M, & Busch, A. (2010). Efficacy of different types of aerobic exercise in fibromyalgia syndrome: a systematic review and meta-analysis of randomized controlled trials. Arthritis Res Ther 12(3): R79. doi: 10.1186/ar3002.

Heberlein, A., Dürsteler-MacFarland, K. M., Lenz, B., Frieling, H., Grösch, M., Bönsch, D.,…Hillemacher, T. (2011). Serum levels of BDNF are associated with craving in opiate-dependent patients. *Journal of Psychopharmacology, 25*(11), 1480-1484. doi: 10.1177/0269881111411332.

Herin, D. V., Rush, C., & Grabowski, J. (2010). Agonist-like pharmacotherapy for stimulant dependence: Preclinical, human laboratory, and clinical studies. Annals of the New York Academy of Sciences, 1187(1), 76–100. PMID: 20201847

Heyn, P., Abreu, B. C., & Ottenbacher, K. J. (2004). The effects of exercise training on elderly persons with cognitive impairment and dementia: A meta-analysis. *Archives of Physical Medicine and Rehabilitation, 85*(10), 1694–1704. doi: https://doi.org/10.1016/j.apmr.2004.03.019

Higgins, S. T., Delaney, D. D., Budney, A. J., Bickel, W. K., Hughes, J. R., Foerg, F., Fenwick J. W. (1991). A behavioral approach to achieving initial cocaine abstinence. American Journal of Psychiatry, 148(9), 1218–1224.

Higgins, S. T., Sigmon, S. C., Wong, C. J., Heil, S. H., Badger, G. J., Donham, R., …Anthony, S. (2003). Community reinforcement therapy for cocaine-dependent outpatients. Archives of General Psychiatry, 60,1043–1052.

Hillhouse, M., Marinelli-Casey, P. Gonzales, R., Ang, A., & Rawson, R.A., & the Methamphetamine Treatment Project Corporate Authors. (2007). Predicting in-treatment performance and post-treatment outcomes in methamphetamine users. *Addiction, 102*, 84-95.

Hirshfield S. Double Jeopardy: Methamphetamine Use and HIV as Risk Factors for COVID-19. AIDS Behav. 2020 Apr 7:1–4. doi: 10.1007/s10461-020-02854-w. Epub ahead of print. PMID: 32266501; PMCID: PMC7137401.

Hser, Y.I., Stark, M.E., Paredes, A., Huang, D., Anglin, M.D., & Rawson, R.A. (2006). A 12-year follow-up of a treated cocaine-dependent sample. *Journal of Substance Abuse Treatment, 30*, 219-226.

Huber, A., Lord, R., Gulati, V., Marinelli-Casey, P., Rawson, R. & Ling, W. (2000). The CSAT Methamphetamine Treatment Project: Research design accommodations for "real world" application. *Journal of Psychoactive Drugs, 32*, 149-156.

Israel JA and Lee, K, 2002. Amphetamine useage and genital self-mutilation. *Addiction 97*:1215-1218.

Jackson, A. S., & Pollock, M. L. (1978). *Generalized equations for predicting body density of men.* ***British Journal of Nutrition,*** *40*(3), 497–504. doi:10.1079/bjn19780152

Jaffe, J.A., Ling, W., & Rawson, R.A. (2005). Amphetamines. In B.J. Sadock & V.A. Sadock (Eds.), *Kaplan and Sadock's comprehensive textbook of psychiatry* (pp.1188-1200). Baltimore, MD: Lippincott.

Jaffe, J.A., Rawson, R.A., & Ling, W.L. (2005). Cocaine. In B.J. Sadock & V.A. Sadock (Eds.), *Kaplan and Sadock's comprehensive textbook of psychiatry* (pp. 1220-1237). Baltimore, MD: Lippincott.

Jayaram-Lindström, N., Hammarberg, A., Beck, O., & Franck, J. (2008). Naltrexone for the treatment of amphetamine dependence: A randomized, placebo-controlled trial. American Journal of Psychiatry, 165(11), 1442–1448. PMID: 18765480

Jayaram-Lindström, N., Konstenius, M., Eksborg, S., Beck, O., Hammarberg, A., & Franck, J. (2008). Naltrexone attenuates the subjective effects of amphetamine in patients with amphetamine dependence. Neuropsychopharmacology, 33(8), 1856. PMID: 17957221

Jayaram-Lindström, N., Wennberg, P., Beck, O., & Franck, J. (2005). An open clinical trial of naltrexone for amphetamine dependence: Compliance and tolerability. Nordic Journal of Psychiatry, 59(3), 167–171. PMID: 16195116

Johnson, B. A., Ait-Daoud, N., Wang, X. Q., Penberthy, J. K., Javors, M. A., Seneviratne, C., & Liu, L. (2013). Topiramate for the treatment of cocaine addiction: A randomized clinical trial. JAMA Psychiatry, 70(12), 1338–1346. PMID: 24132249

Kampman, K. M., Lynch, K. G., Pettinati, H. M., Spratt, K., Wierzbicki, M. R., Dackis, C., & O'Brien, C. P. (2015). A double blind, placebo controlled trial of modafinil for the treatment of cocaine dependence without co-morbid alcohol dependence. Drug and Alcohol Dependence, 155, 105–110. PMCID: PMC4582003

Kampman, K. M., Pettinati, H., Lynch, K. G., Dackis, C., Sparkman, T., Weigley, C., & O'Brien, C. P. (2004). A pilot trial of topiramate for the treatment of cocaine dependence. Drug and Alcohol Dependence, 75(3), 233–240. PMID: 15283944

Karno, M., Farabee, D., Brecht, M.L., & Rawson, R.A. (2012). Patient reactance moderates the effect of directive telephone counseling for methamphetamine users. *Journal of Studies on Alcohol and Drugs*, *73*, 844–850. PMCID: PMC3410952

Kingston, R. E. F., Marcel, C., & Mills, K. L. (2017). A systematic review of the prevalence of comorbid mental health disorders in people presenting for substance use treatment in Australia. *Drug and Alcohol Review, 36*(4), 527-539. doi: 10.1111/dar.12448.

Kinnunen, T., Leeman, R. F., Korhonen, T., Quiles, Z. N., Terwal, D. M., Garvey, A. J., & Hartley, H. L. (2008). Exercise as an adjunct to nicotine gum in treating tobacco dependence among women. *Nicotine & Tobacco Research, 10*(4), 689–703. doi: 10.1080/14622200801979043.

Klein, M. H., Greist, J. H., Gurman, A. S., Neimeyer, R. A., Lesser, D. P., Bushnell, N. J., & Smith, R. E. (1985). A comparative outcome study of group psychotherapy vs. exercise treatments for depression. *International Journal of Mental Health, 13*, 148–176. doi: https://doi.org/10.1080/00207411.1984.11448982

Knapp, W. P., Soares, B., Farrell, M., Lima, M. S. (2007). Psychosocial interventions for cocaine and psychostimulant amphetamines related disorders. Cochrane Database Systematic Reviews, (3). PMID: 17636713

Kohno, M., Okita, K., Morales, A.M., Robertson, C.L., Dean, A.C., Ghahremani, D.G., Saab, F.W., Rawson, R.A., Mandelkern, M.A., Bilder, R.M., & London, E.D. (2016). Midbrain functional connectivity and ventral striatal dopamine D2-type receptors: Link to impulsivity in methamphetamine users. *Molecular Psychiatry*. doi: 10.1038/mp.2015.223 [Epub ahead of print]. PMCID: PMC4970974

Kopera, M., Wojnar, M., Brower, K., Glass, J., Nowosad, I., Gmaj, B., & Szelenberger, W. (2012). Cognitive functions in abstinent alcohol-dependent patients. *Alcohol, 46*(7), 665–671.doi: 10.1016/j.alcohol.2012.04.005.

Korcha, R. A., Polcin, D. L., Evans, K., Bond, J. C., & Galloway, G. P. (2014). Intensive motivational interviewing for women with concurrent alcohol problems and methamphetamine dependence. Journal of Substance Abuse Treatment, 46(2), 113–119. doi:10.1016/j.jsat.2013.08.013

Korhonen, T., Kujala, U. M., Rose, R. J., & Kaprio, J. (2009). Physical activity in adolescence as a predictor of alcohol and illicit drug use in early adulthood: A longitudinal population-based twin study. *Twin Research and Human Genetics, 12*(3), 261–268. doi: 10.1375/twin.12.3.261.

Kosten, T. R., & Biegel, D. (2002). Therapeutic vaccines for substance dependence. Expert Review of Vaccines, 1(3), 365–371. PMID: 14761239

Kosten, T. R., Domingo, C. B., Shorter, D., Orson, F., Green, C., Somoza, E.,... & Tompkins, D. A. (2014). Vaccine for cocaine dependence: A randomized double-blind placebo-controlled efficacy trial. Drug and Alcohol Dependence, 140, 42–47. PMCID: PMC4073297

Kosten, T. R., Wu, G., Huang, W., Harding, M. J., Hamon, S. C., Lappalainen, J., & Nielsen, D. A. (2013). Pharmacogenetic randomized trial for cocaine abuse: Disulfiram and dopamine β-hydroxylase. Biological Psychiatry, 73(3), 219–224. PMCID: PMC3514624

Lappin JM, Darke S, Farrell M. Stroke and methamphetamine use in young adults: a review. J Neurol Neurosurg Psychiatry. 2017 Dec;88(12):1079-1091. doi:10.1136/jnnp-2017-316071. Epub 2017 Aug 23. PMID: 28835475.

LaRue L, Twillman RK, Dawson E, Whitley P, Frasco MA, Huskey A, Guevara MG. Rate of Fentanyl Positivity Among Urine Drug Test Results Positive for Cocaine or Methamphetamine. JAMA Netw Open. 2019 Apr 5;2(4):e192851. doi:10.1001/jamanetworkopen.2019.2851. Erratum in: JAMA Netw Open. 2019 Oct 2;2(10):e1916040. PMID: 31026029; PMCID: PMC6487565.

Lee, N. K., & Rawson, R. A. (2008). A systematic review of cognitive and behavioural therapies for methamphetamine dependence. Drug and Alcohol Review, 27(3), 309–317. PMCID: PMC 4445690

Lee, R. C., Wang, Z., Heo, M., Ross, R., Janssen, I., & Heymsfield, S. B. (2000). Total-body skeletal muscle mass: Development and cross-validation of anthropometric prediction models1–3. *American Journal of Clinical Nutrition, 72*(3), 796–803. doi:10.1093/ajcn/72.3.796

Leventhal, AM, Kahler, CW, Ray, LA, Stone, K, Young, D., Chelminski, I, Zimmerman, M. 2008, Anhedonia and Amotivation in Psychiatric Outpatients with Fully Remitted Stimulant Use Disorder The American Journal on Addiction. Volume17, Pages 218-223

Levin, F. R., Evans, S. M., Brooks, D. J., & Garawi, F. (2007). Treatment of cocaine dependent treatment seekers with adult ADHD: Double-blind comparison of methylphenidate and placebo. Drug and Alcohol Dependence, 87(1), 20–29. PMID: 16930863

Levin, F. R., Mariani, J. J., Specker, S., Mooney, M., Mahony, A., Brooks, D. J., ... & Grabowski, J. (2015). Extended-release mixed amphetamine salts vs placebo for comorbid adult attention-deficit/hyperactivity disorder and cocaine use disorder: A randomized clinical trial. JAMA Psychiatry, 72(6), 593–602. PMCID: PMC4456227

Ling, W., Chang, L., Hillhouse, M., Ang, A., Striebel, J., Jenkins, J.,... & Fukaya, E. (2014). Sustained-release methylphenidate in a randomized trial of treatment of methamphetamine use disorder. Addiction, 109(9), 1489–1500. PMCID: PMC4127124

Ling, W., Hillhouse, M. P., Saxon, A. J., Mooney, L. J., Thomas, C .M., Ang, A.,…Rotrosen, J. (2016). Buprenorphine+Naloxone plus Naltrexone for the treatment of cocaine dependence: The cocaine use reduction with Buprenorphine (CURB) study. Addiction, 111(8), 1416–1427. PMCID: PMC4940267

Ling, W., Mooney, L., & Rawson, R.A. (2013). Amphetamine-type stimulants. In B.S. McCrady & E.E. Epstein (Eds.), *Addictions: A comprehensive guidebook* (2nd Edition, Chapter 8). New York: Oxford University Press.

Ling, W., Rawson, R.A., & Shoptaw, S. (2006) Management of methamphetamine abuse and dependence. *Current Psychiatry Reports, 8*, 345-354.

Linke, S. E., & Ussher, M. (2015). Exercise-based treatments for substance use disorders: Evidence, theory, and practicality. *American Journal of Drug and Alcohol Abuse, 41*(1), 7–15. doi: 10.3109/00952990.2014.976708.

Lion, L. S. (1978). Psychological effects of jogging: A preliminary study. *Perceptual and Motor Skills, 47*, 1215–1218. doi:10.2466/pms.1978.47.3f.1215

Liu, Q., Shen, Y., Cao, X., Li, Y., Chen, Y., Yang, W., & Yuan, T.-F. (2017). Either at left or right, both high and low frequency rTMS of dorsolateral prefrontal cortex decreases cue induced craving for methamphetamine: rTMS for Meth Craving. American Journal on Addictions, 26. 10.1111/ajad.12638.

Lohman, T. G., Roche, A. F., & Martorell, R. (Eds.). (1991). *Anthropometric standardization reference manual*. Champaign, IL: Human Kinetics Books.

London, E.D., Berman, S., Voytek, B., Simon, S.L., Mandelkern, M.A., Monterrosso, J., Thompson, P., Brody, A., Gaega, J., Hong, M., Hayashi, K., Rawson, R.A., & Ling, W. (2005). Cerebral metabolic dysfunction and impaired

vigilance in recently abstinent methamphetamine users. *Biological Psychiatry, 58*, 770-778.

London, E.D., Simon, S.L., Berman, S.M., Mandelkern, M.A., Lichtman, A.M., Bramen, J., Shinn, A.K., Miotto, K., Learn, J., Dong, Y., Matochik, J.A., Kurian, V., Newton, T., Woods, R., Rawson, R.A., & Ling, W.L. (2004). Mood disturbances and regional cerebral metabolic abnormalities in recently abstinent methamphetamine abusers. *Archives of General Psychiatry, 61*,73-84.

Lopez A, Rothberg B, Reaser E, Schwenk S, Griffin R. Therapeutic groups via video teleconferencing and the impact on group cohesion. Mhealth. 2020 Apr 5;6:13. doi: 10.21037/mhealth.2019.11.04. PMID: 32270005; PMCID: PMC7136655.

Lundqvist, T. (2005). Cognitive consequences of cannabis use: Comparison with abuse of stimulants and heroin with regard to attention, memory and executive functions. *Pharmacology, Biochemistry & Behavior, 81*(2), 319–330. doi:10.1016/j.pbb.2005.02.017

Lynch, W. J., Piehl, K. B., Acosta, G., Peterson, A. B., & Hemby, S. E. (2010). Aerobic exercise attenuates reinstatement of cocaine-seeking behavior and associated neuroadaptations in the prefrontal cortex. *Biological Psychiatry, 68*(8), 774–777. doi: 10.1016/j.biopsych.2010.06.022. Epub 2010 Aug 8.

Ma, J.Z., Johnson, B.A., Yu, E., Weiss, D., McSherry, F., Saadvandi, J., Iturriaga, E., Ait-Daoud, N., Rawson, R.A., Hrymoc, M., Campbell, J., Gorodetzky, C., Haning, W., Carlton, B., Mawhinney, J., Weis, D., McCann, M., Pham, T., Stock, C., Dickinson, R., Elkashef, A., & Li, M.D. (2013). Fine-grain analysis of the treatment effect of topiramate on methamphetamine addiction with latent variable analysis. *Drug and Alcohol Dependence, 130*(1-3), 45-51. PMID: 23142494

Manthou, E., Georgakouli, K., Fatouros, I. G., Gianoulakis, C., Theodorakis, Y., Jamurtas, A. Z. (2016). Role of exercise in the treatment of alcohol use disorders. *Biomedical Reports, 4*(5), 535–545. doi:10.3892/br.2016.626

Mariani, J. J., Pavlicova, M., Bisaga, A., Nunes, E. V., Brooks, D. J., & Levin, F. R. (2012). Extended-release mixed amphetamine salts and topiramate for cocaine dependence: A randomized controlled trial. Biological Psychiatry, 72(11), 950–956. PMCID: PMC3648884

Marinelli-Casey, P., Gonzales, R., Hillhouse, M., Ang, A., Zweben, J., Cohen, J., Fulton Hora P., Rawson, R.A., and the Methamphetamine Treatment Project Corporate Authors (2008). Drug court treatment for methamphetamine dependence: Treatment response and post-treatment outcomes. *Journal of Substance Abuse Treatment, 34*(2), 242-248. PMID: 17596903

Marlatt, G. A. (1996). Taxonomy of high-risk situations for alcohol relapse: Evolution and development of a cognitive-behavioral model. *Addiction, 91*(12)(Suppl 1), S37–S49. doi:https://doi.org/10.1046/j.1360-0443.91.12s1.15.x

Martell, B. A., Orson, F. M., Poling, J., Mitchell, E., Rossen, R. D., Gardner, T., & Kosten, T. R. (2009). Cocaine vaccine for the treatment of cocaine dependence in methadone-maintained patients: A randomized, double-blind, placebo-controlled efficacy trial. Archives of General Psychiatry, 66(10), 1116–1123. PMCID: PMC2878137

Martinsen, E. W. (2008). Physical activity in the prevention and treatment of anxiety and depression. *Nordic Journal of Psychiatry, 62*(Suppl 47), 25–29. doi: 10.1080/08039480802315640.

Martinsen, E. W., Medhus, A., & Sandvik, L. (1985). Effects of aerobic exercise on depression: A controlled study. *British Medical Journal (Clinical Research Edition)*, *291*(6488), 109. doi:10.1136/bmj.291.6488.109

McCann, DJ., & Li, SH. (2012). A novel, nonbinary evaluation of success and failure reveals bupropion efficacy versus methamphetamine dependence: reanalysis of a multisite trial. CNS Neuroscience & Therapeutics, 18(5), 414–418. PMID: 22070720

McCann, M.J., Obert, J.L., Marinelli-Casey, P., & Rawson, R.A. (2005) *Meth: The basics*. Center City, MN: Hazelden.

McDonough, S. M., Tully, M. A., O'Connor, S. R., Boyd, A., Kerr, D. P., O'Neill, S. M.,…Hurley, D. A. (2010). The back 2 activity trial: Education and advice versus education and advice plus a structured walking programme for chronic low back pain. *BMC Musculoskeletal Disorders, 11*, 163. doi: 10.1186/1471-2474-11-163.

McGee SM, McGee DN, McGee MB. Spontaneous intracerebral hemorrhage related to methamphetamine abuse: autopsy findings and clinical correlation. Am J

Forensic Med Pathol. 2004 Dec;25(4):334-7. doi: 10.1097/01.paf.0000137206.16785.2f. PMID:15577524.

McGregor, C., Srisurapanont, M., Jittiwutikarn, J., Laobhripatr, S., Wongtan, T., & White, J. M. (2005). The nature, time course and severity of methamphetamine withdrawal. *Addiction, 100*(9), 1320–1329. doi:10.1111/j.1360-0443.2005.01160.x

McLellan, R. (2013). Exercise programs for patients with cancer improve physical functioning and quality of life. *Journal of Physiotherapy, 59*(1), 57. doi: 10.1016/S1836-9553(13)70150-4.

McNeil, J. K., LeBlanc, E. M., & Joyner, M. (1991). The effect of exercise on depressive symptoms in the moderately depressed elderly. *Psychology and Aging, 6*(3), 487–488. doi: http://dx.doi.org/10.1037/0882-7974.6.3.487

Meeusen, R. (2005). Exercise and the brain: Insight in new therapeutic modalities. Annals of Transplantation, 10(4), 49–51. PMID: 17037089

Meeusen, R. (2005). Exercise and the brain: Insight in new therapeutic modalities. *Annals of Transplantation, 10*(4), 49–51. PMID:17037089

Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3), 141–154. doi:10.1080/10673220591003605

Messina, N., Farabee, D., & Rawson, R. (2003). Treatment responsivity of cocaine-dependent patients with antisocial personality disorder in cognitive behavioral and contingency management interventions. *Journal of Consulting and Clinical Psychology, 71*,320-329.

Messina, N., Farabee, D., & Rawson, R. (2007). Cocaine-dependent patients with antisocial personality disorder. *Journal of Drug Addiction, Education and Eradication, 3*(1/2), 75-96.

Messina, N., Jeter, K., Marinelli-Casey, P., West, K., Rawson, R.A. (2014). Children exposed to methamphetamine use and manufacture. *Child Abuse & Neglect, 38*(11), 1872-1883. doi: 10.1016/j.chiabu.2006.06.009. PMCID: PMC3029499

Messina, N., Marinelli-Casey, P., Hillhouse, M., Hunter, J., & Rawson, R. (2008). Childhood adverse events and health outcomes among methamphetamine-dependent men and women. *International Journal of Mental Health and Addiction, 6*(4), 522-536.

Messina, N., Marinelli-Casey, P., Hillhouse, M., Rawson, R., Hunter, J., & Ang, A. (2008). Childhood adverse events and methamphetamine use among men and women. *The Journal of Psychoactive Drugs, Suppl. 5*, 399-409. PMID: 19248397

Methamphetamine Use Disorder: A Review. JAMA Psychiatry. 2020 Apr 8. doi: 10.1001/jamapsychiatry.2020.0246. Epub ahead of print. PMID: 32267484.

Miguel AQC, Madruga CS, Cogo-Moreira H, Yamauchi R, Simões V, Ribeiro A, da Silva CJ, Fruci A, McDonell M, McPherson S, Roll JM, Laranjeira RR. Contingency management targeting abstinence is effective in reducing depressive and anxiety symptoms among crack cocaine-dependent individuals. Exp Clin Psychopharmacol. 2017 Dec;25(6):466-472. doi: 10.1037/pha0000147. PMID: 29251975; PMCID: PMC5737792.

Minozzi, S., Saulle, R., De Crescenzo, F., & Amato, L. (2016). Psychosocial interventions for psychostimulant misuse. Cochrane Database of Systematic Reviews, (9). PMCID: PMC6457581

Mintzer, M. Z., & Stitzer, M. L. (2002). Cognitive impairment in methadone maintenance patients. *Drug and Alcohol Dependence, 67*(1), 41–51. doi: https://doi.org/10.1016/S0376-8716(02)00013-3

Mooney, L., & McKance-Katz, E. (2016). Psychopharmacological treatments for substance use disorders. In A. Mack, K. Brady, S. Miller, &, R. Frances (Eds.), Clinical textbook of addictive disorders (4th ed.). New York, NY: Guilford Press.

Mooney, L.J., Cooper, C., London, E.D., Chudzynski, J., Dolezal, B., Dickerson, D., Brecht, M.-L., Peñate, J., & Rawson, R.A. (2013). Exercise for methamphetamine dependence: Rationale, design, and methodology. *Contemporary Clinical Trials, 37*(1), 139-147. doi: 10.1016/j.cct.2013.11.010. PMCID: PMC4431553

Mooney, L.J., Cooper, C.B., London, E.D., Chudzynski, J., & Rawson, R.A. (2015). Exercise for substance use disorders. In N. el-Guebaly, G. Carrà, & M. Galanter (Eds.), *Textbook of addiction treatment: International perspectives* (pp. 973-986). Milan: Springer.

Mooney, L.J., Glasner-Edwards, S., Marinelli-Casey, P., Hillhouse, M., Ang, A., Hunter, J., Haning, B., Colescott, P, Ling, W., & Rawson, R.A. (2009). Health conditions in methamphetamine-dependent adults 3 years after treatment. *Journal of Addiction Medicine, 3(3), 155-163. PMID: 21769012*

Mooney, L.J., Glasner-Edwards, S., Rawson, R.A., & Ling, W. (2009) Medical effects of methamphetamine use. In J.M. Roll, R.A. Rawson, W. Ling, & S. Shoptaw (Eds.), *Methamphetamine addiction: From basic science to treatment* (pp. 117-142). New York: Guilford Press.

Mooney, M. E., Herin, D. V., Schmitz, J. M., Moukaddam, N., Green, C. E., & Grabowski, J. (2009). Effects of oral methamphetamine on cocaine use: A randomized, double-blind, placebo-controlled trial. Drug and Alcohol Dependence, 101(1–2), 34–1. PMCID: PMC2742691

Mooney, M. E., Herin, D. V., Specker, S., Babb, D., Levin, F. R., & Grabowski, J. (2015). Pilot study of the effects of lisdexamfetamine on cocaine use: A randomized, double-blind, placebo-controlled trial. Drug and Alcohol Dependence, 153, 94–103. PMCID: PMC4509923

Morris, L., Stander, J., Ebrahim, W., Eksteen, S., Meaden, O. A., Ras, A., & Wessels, A. (2018). Effect of exercise versus cognitive behavioural therapy or no intervention on anxiety, depression, fitness and quality of life in adults with previous methamphetamine dependency: A systematic review. *Addiction Science and Clinical Practice, 13,* 4. doi: 10.1186/s13722-018-0106-4
National Strength and Conditioning Association (NSCA). (2010). Strength and conditioning professional standards and guidelines. Colorado Springs, CO: Author. Available at http://www.nsca-lift.org/publications/SCStandards.pdf

Neeper, S. A., Gomez-Pinilla, F., Choi, J., & Cotman, C. (1995). Exercise and brain neurotrophins. *Nature, 373*(6510), 109. doi:10.1038/373109a0

Newton, T. F., De La Garza, R., 2nd, Kalechstein, A. D., & Nestor, L. (2005). Cocaine and methamphetamine produce different patterns of subjective and cardiovascular effects. Pharmacology, Biochemistry and Behavior, 82, 90–97.

Newton, T. F., Roache, J. D., De La Garza II, R., Fong, T., Wallace, C. L., Li, S. H., ... & Kahn, R. (2006). Bupropion reduces methamphetamine-induced subjective effects and cue-induced craving. Neuropsychopharmacology, 31(7), 1537. PMID: 16319910

Newton, TF, De La Garza R 2nd, Kalechstein AD, and Nestor L, 2005. Cocaine and methamphetamine produce different patterns of subjective and cardiovascular effects. *Pharmacology, Biochemistry, and Behavior 82*: 90-97.

NIDA. 2020, June 1. Community Reinforcement Approach Plus Vouchers (Alcohol, Cocaine, Opioids). Retrieved from

https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/evidence-based-approaches-to-drug-addiction-treatment/behavioral-therapies/community-reinforcement-approach-vouchers on 2020, July 20

North, T. C., McCullagh, P., & Tran, Z. V. (1990). Effects of exercise on depression. *Exercise and Sport Sciences Review, 18*, 379–415. PMID2141567

Nosyk, B., Li, L., Evans, E., Urada, D., Huang, D., Wood, E., Rawson, R., & Hser, Y.-I. (2015). Erratum to "Utilization and outcomes of detoxification and maintenance treatment for opioid dependence in publicly-funded facilities in California, US: 1991–2012" [*Drug Alcohol Depend*. 143 (2014) 149–157]. *Drug and Alcohol Dependence, 148*, 230-232.
doi: http://dx.doi.org/10.1016/j.drugalcdep.2014.10.018

Nuijten, M., Blanken, P., van de Wetering, B., Nuijen, B., van den Brink, W., & Hendriks, V. M. (2016). Sustained-release dexamfetamine in the treatment of chronic cocaine-dependent patients on heroin-assisted treatment: A randomised, double-blind, placebo-controlled trial. The Lancet, 387(10034), 2226–2234. PMID: 27015909

Numachi Y, Ohara A, Yamashita M, Fukushima S, Kobayashi H, Hata H, Watanabe H, Hall FS, Lesch KP, Murphy DL, Uhl GR, Sora I, 2007. Methamphetamine-induced hyperthermia and lethal toxicity: Role of the dopamine and serotonin transporters. *Eur J Pharmacol 572*(2-3):120-8.

Nunes, E. V., & Levin, F. R. (2004). Treatment of depression in patients with alcohol or other drug dependence: A meta-analysis. *JAMA, 291*915), 1887–1896. doi:10.1001/jama.291.15.1887

O'Daly, O. G., Guillin, O., Tsapakis, E.-M., & Martinez, D. (2005). Schizophrenia and substance abuse co-morbidity. Journal of Dual Diagnosis, 1(2), 1–40.

Obert, J.L., McCann, M.J., Marinelli-Casey, P., Weiner, A., Minsky, S., Brethen, P., & Rawson, R.A. (2000). The Matrix Model of outpatient substance abuse treatment: History and description. *Journal of Psychoactive Drugs, 32*(2), 157-164.

O'Dell, S. J., Galvez, B. A., Ball, A. J., & Marshall, J. F. (2012). Running wheel exercise ameliorates methamphetamine-induced damage to dopamine and serotonin terminals. *Synapse, 66*(1), 71–80. doi: 10.1002/syn.20989.

Oliveto, A., Poling, J., Mancino, M. J., Feldman, Z., Cubells, J. F., Pruzinsky, R., ... & Gonzalez-Haddad, G. (2011). Randomized, double blind, placebo-controlled trial of disulfiram for the treatment of cocaine dependence in methadone-stabilized patients. Drug and Alcohol Dependence, 113(2-3), 184–191. PMCID: PMC3005977

Pal, R., Mendelson, J. E., Flower, K., Garrison, K., Yount, G., Coyle, J. R., & Galloway, G. P. (2015). Impact of prospectively-determined A118G polymorphism on treatment response to injectable naltrexone among methamphetamine-dependent patients: An open-label, pilot study. Journal of Addiction Medicine, 9(2), 130. PMCID: PMC4375053

Pani, P. P., Troqu, E., Vacca, R., Amato, L., Vecchi, S., & Davoli, M. (2010). Disulfiram for the treatment of cocaine dependence. Cochrane Database Systematic Reviews, (1). PMID: 20091613

Paulus MP, Stewart JL. Neurobiology, Clinical Presentation, and Treatment of

Paulus, M. P., Hozack, N., Frank, L., Brown, G. G., & Schuckit, M. A. (2003). Decision making by methamphetamine-dependent subjects is associated with error-rate-independent decrease in prefrontal and parietal activation. *Biological Psychiatry, 53*(1), 65–74. doi: https://doi.org/10.1016/S0006-3223(02)01442-7

Payne L, Flannery H, Kambakara Gedara C, Daniilidi X, Hitchcock M, Lambert D, Taylor C, Christie D. Business as usual? Psychological support at a distance. Clin Child Psychol Psychiatry. 2020 Jul;25(3):672-686. doi: 10.1177/1359104520937378. Epub 2020 Jun 27. PMID: 32594756.

Petrakis, I. L., Carroll, M., Nich, C., Gordon, L. T., McCance-Katz, E. F., Frankforter, T., & Rounsaville, B. J. (2000). Disulfiram treatment for cocaine dependence in methadone-maintained opioid addicts. Addiction, 95(2), 219–228. PMID: 10723850

Petry NM, Alessi SM, Rash CJ. Contingency management treatments decrease psychiatric symptoms. J Consult Clin Psychol. 2013 Oct;81(5):926-31. doi: 10.1037/a0032499. Epub 2013 Apr 1. PMID: 23544678; PMCID: PMC3880674.

Petry, N. M. (2000). A comprehensive guide to the application of contingency management procedures in clinical settings. Drug and Alcohol Dependence, 58(1–2), 9–25. PMID: 10669051

Petry, N. M., Peirce, J. M., Stitzer, M. L., Blaine, J., Roll, J. M., Cohen, A.,…Li, R. (2005). Effect of prize-based incentives on outcomes in stimulant abusers in outpatient psychosocial treatment programs: A National Drug Abuse Treatment Clinical Trials Network study. Archives of General Psychiatry, 62(10), 1148–1156. doi:10.1001/archpsyc.62.10.1148

Pinto, B. M., Dunsiger, S. I., Farrell, N., Marcus, B. H., & Todaro, J. F. (2013). Psychosocial outcomes of an exercise maintenance intervention after phase II cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation and Prevention, 33*(2), 91-98. doi: 10.1097/HCR.0b013e3182825531

Ploughman, M. (2008). Exercise is brain food: The effects of physical activity on cognitive function. *Developmental Neurorehabilitation*, *11*(3), 236–240. doi: 10.1080/17518420801997007

Polcin, D. L., Bond, J., Korcha, R., Nayak, M. B., Galloway, G. P., & Evans, K. (2014). Randomized trial of intensive motivational interviewing for methamphetamine dependence. Journal of Addictive Diseases, 33(3), 253–265. doi:10.1080/10550887.2014.950029

Poling, J., Kosten, T. R., & Sofuoglu, M. (2007). Treatment outcome predictors for cocaine dependence. *American Journal of Drug and Alcohol Abuse, 33*(2), 191–206. doi:10.1080/00952990701199416

Poling, J., Oliveto, A., Petry, N., Sofuoglu, M., Gonsai, K., Gonzalez, G.,... & Kosten, T. R. (2006). Six-month trial of bupropion with contingency management for cocaine dependence in a methadone-maintained population. Archives of General Psychiatry, 63(2), 219–228. PMID: 16461866

Proebstl L, Krause D, Kamp F, Hager L, Manz K, Schacht-Jablonowsky M, Straif M, Riebschläger M, Neumann S, Schreiber A, Soyka M, Koller G. Methamphetamine withdrawal and the restoration of cognitive functions - a study over a course of 6 months abstinence. Psychiatry Res. 2019 Nov;281:112599. doi: 10.1016/j.psychres.2019.112599. Epub 2019 Oct 3. PMID: 31629302.

Prosser, G., Carson, P., Phillips, R., Gelson, A., Buch, N., Tucker, H.,…Simpson, T. (1981). Morale in coronary patients following an exercise programme. *Journal of Psychosomatic Research, 25*(6), 587–593. doi: https://doi.org/10.1016/0022-3999(81)90114-8

Radfar, S.R., & Rawson, R.A. (2014). Current research on methamphetamine: Epidemiology, medical and psychiatric effects, treatment, and harm reduction

efforts. *Addiction & Health, 6*(3-4), 146-154. http://ahj.kmu.ac.ir/index.php/ahj/article/view/187/229 PMCID: PMC4354220.

Radfar, S.R., Cousins, S.J., Shariatirad, S., Noroozi, A., & Rawson, R.A. (2016). Methamphetamine use among patients undergoing methadone maintenance treatment in Iran; a threat for harm reduction and treatment strategies: A qualitative study. *International Journal of High Risk Behaviors & Addiction*. doi: 10.5812/ijhrba.30327 [Epub ahead of print].

Radfar, S.R., Sedaghat, A., Banihashemi, A.T., Gouya, M., & Rawson, R.A. (2014). Behaviors influencing human immunodeficiency virus transmission in the context of positive prevention among people living with HIV/acquired immunodeficiency syndrome in Iran: A qualitative study. *International Journal of Preventive Medicine, 5*(8), 976-983. PMCID: PMC4258663

Raglin, J. S., & Morgan, W. P. (1987). Influence of exercise and quiet rest on state anxiety and blood pressure. *Medicine and Science in Sports and Exercise*, *19*, 456–463. PMID:3316903

Ramey, T., & Regier, P. S. (2018). Cognitive impairment in substance use disorders. *CNS Spectrums, Dec. 28*, 1-12. doi: 10.1017/S1092852918001426 [Epub ahead of print].

Rawson, R. A., Chudzynski, J., Gonzales, R., Mooney, L., Dickerson, D., Ang, A., Dolezal, B., & Cooper, C. B. (2015). The impact of exercise on depression and anxiety symptoms among abstinent methamphetamine-dependent individuals in a residential treatment setting. *Journal of Substance Abuse Treatment, 57*, 36–40. doi: 10.1016/j.jsat.2015.04.007

Rawson, R. A., Chudzynski, J., Mooney, L., Gonzales, R., Ang, A., Dickerson, D., Penate, J., Salem, B. A., Dolezal, B., & Cooper, C. B. (2015). Impact of an exercise intervention on methamphetamine use outcomes post-residential treatment care. Drug and Alcohol Dependence, 156, 21–28. PMCID: PMC4633370. doi: 10.1016/j.drugalcdep.2015.08.029.

Rawson, R. A., Huber, A., McCann, M. J, Shoptaw, S., Farabee, D., Reiber, C., & Ling, W. (2002). A comparison of contingency management and cognitive-behavioral approaches during methadone maintenance treatment for cocaine dependence. Archives of General Psychiatry, 59(9), 817–824. PMID: 12215081

Rawson, R. A., Marinelli-Casey, P., Anglin, M. D., Dickow, A., Frazier, Y., Gallagher, C.,…and the Methamphetamine Treatment Project Corporate Authors. (2004). A multi-site comparison of psychosocial approaches for the treatment of methamphetamine dependence. Addiction, 99, 708–717.

Rawson, R., Gonzales, R., Marinelli-Casey, P., & Ang, A. (2007). Methamphetamine dependence: A closer look at treatment response and clinical characteristics associated with route of administration in outpatient treatment. *American Journal on Addictions, 16*(4), 291-299.

Rawson, R., Gonzales, R., Pearce, V., Ang, A., Marinelli-Casey, P., Brummer, J., and the Methamphetamine Treatment Project Corporate Authors. (2008). Methamphetamine dependence and human immunodeficiency virus. *Journal of Substance Abuse Treatment, 35*, 279-284. PMCID: PMC2630179

Rawson, R.A. (1999). TIP 33: *Treatment for stimulant abuse disorders: Treatment Improvement Protocol (TIP) Series 33.* Center for Substance Abuse Treatment (CSAT). (Chair, CSAT Consensus panel). Rockville, MD: U.S. Department of Health and Human Services.

Rawson, R.A. (2006). *Methamphetamine: New knowledge, new treatments*. Center City, MN: Hazelden.

Rawson, R.A. (2009). Treatments for methamphetamine dependence: Contingency management and the Matrix Model. In R. Pates & D. Riley (Eds.), *Interventions for amphetamine misuse* (pp. 83-100). Oxford, UK. Wiley Blackwell.

Rawson, R.A. (2013). Current research on the epidemiology, medical and psychiatric effects, and treatment of methamphetamine use. *Journal of Food and Drug Analysis, 21*(4), S77-S81. doi: 10.1016/j.jfda.2013.09.039 PMCID: PMC4158843

Rawson, R.A., & Condon, T., (2007). Why do we need a special issue of *Addiction* focused on methamphetamine? *Addiction, 102*, 1-4.

Rawson, R.A., & Gonzales, R. (2010). Commentary on Marshall et al. (2010): Are long-term negative health consequences of methamphetamine use important to youth? *Addiction, 105*, 1003-1004. PMCID: PMC4074535

Rawson, R.A., & Ling, W.L. (2008). Methamphetamine abuse and dependence: Current treatments. In M. Galanter & H. Kleber (Eds.), *Textbook of substance abuse treatment*. Arlington, VA: American Psychiatric Association Press.

Rawson, R.A., & Rutkowski, B.A. (2007, October 11). Prime numbers: A matter of life or meth. *Foreign Policy, 163*, 32-33.

Rawson, R.A., Anglin, M.D., & Ling, W. (2002). Will the methamphetamine problem go away? *Journal of Addictive Diseases 21*, 5-19.

Rawson, R.A., Chudzynski, J., Gonzales, R., Mooney, L., Dickerson, D., Ang, A., Dolezal, B., & Cooper, C.B. (2015). The impact of exercise on depression and anxiety symptoms among abstinent methamphetamine-dependent individuals in a residential treatment setting. *Journal of Substance Abuse Treatment, 57*, 36-40. doi:10.1016/j.jsat.2015.04.007. PMC4560957

Rawson, R.A., Gonzales, R., & Ling, W. (2006) Methamphetamine abuse and dependence: An update. *New Directions in Psychiatry, 26*, 221-236.

Rawson, R.A., Gonzales, R., & Ling, W. (2011). Clinical aspects of methamphetamine. In B.A. Johnson (Ed.), *Addiction medicine: Science and Practice* (Vol. 1, pp. 495-510). New York: Springer.

Rawson, R.A., Gonzales, R., Greenwell, L., & Chalk, M. (2012). Process-of-care measures as predictors of client outcome among a methamphetamine-dependent sample at 12- and 36-month follow-ups. *Journal of Psychoactive Drugs, 44*(4), 342-349. PMCID: PMC4018415

Rawson, R.A., Gonzales, R., McCann, M., & Ling, W. (2007). Use of methamphetamine by young people: Is there reason for concern? *Addiction, 102*(7), 1021-1022.

Rawson, R.A., Gonzales, R., Obert, J.L., McCann, M.J., & Brethen, P. (2005). Methamphetamine use among treatment-seeking adolescents in Southern California: Participant characteristics and treatment response. *Journal of Substance Abuse Treatment, 29*(2), 67-74.

Rawson, R.A., Gonzales, R.G., & Brethen, P. (2002). Methamphetamine: Current research findings and clinical challenges. *Journal of Substance Abuse Treatment 23*, 145-150.

Rawson, R.A., Huber, A., Brethen, P., Obert, J.L., Gulati, V., Shoptaw, S., & Ling, W. (2002). Status of methamphetamine users 2-5 years after outpatient treatment. *Journal of Addictive Diseases 21*, 107-119.

Rawson, R.A., Huber, A., Brethen, P.B., Obert, J.L., Gulati, V., Shoptaw, S., & Ling,W. (2000). Methamphetamine and cocaine users: Differences in characteristics and treatment retention. *Journal of Psychoactive Drugs, 32*, 233-238.

Rawson, R.A., Ling, W., & Mooney, L.J. (2015). Clinical management: Methamphetamine. In Galanter, M., Kleber, H.D., & Brady, K. (Eds.), *The American Psychiatric Publishing textbook of substance abuse treatment (5th Edition)*. Arlington, VA: American Psychiatric Publishing.

Rawson, R.A., Marinelli-Casey, P., & Huber, A. (2002). Treating methamphetamine dependence in adults. In R. Straw & J.M. Herrell (Eds.), Conducting multiple site evaluations in real world settings. *New Directions in Evaluation, 94*, 73-87.

Rawson, R.A., McCann, M.J, Huber, A., Marinelli-Casey, P., & Williams, L. (2000). Moving research into community settings in the CSAT Methamphetamine Treatment Project: The coordinating center perspective. *Journal of Psychoactive Drugs, 32*(2), 201-208.

Rawson, R.A., McCann, M.J., Flammino, F., Shoptaw, S., Miotto, K., Reiber, C., & Ling, W. (2006). A comparison of contingency management and cognitive-behavioral approaches for stimulant-dependent individuals. *Addiction, 101*(2), 267-74.

Rawson, R.A., McCann, M.J., Hasson, A., & Ling, W. (2000). Addiction pharmacotherapy 2000: New options and new challenges. *Journal of Psychoactive Drugs, 32*, 371-378.

Rawson, R.A., Rataemane, S., Rataemane, L., Ntlhe, N., Fox, R.S., McCuller, J., & Brecht, M.-L. (2013). Dissemination and implementation of cognitive behavioral therapy for stimulant dependence: A randomized trial comparison of 3 approaches. *Substance Abuse, 34*(2), 108-117. PMCID: PMC3625982

Rawson, R.A., Shoptaw, S.J., Obert, J.L., McCann, M.J., Hasson, A.L., Marinelli-Casey, P.J., Brethen, P.R., & Ling, W. (1995). An intensive outpatient approach

for cocaine abuse treatment: The Matrix Model. *The Journal of Substance Abuse Treatment, 12*(2), 117-127

Rawson, R.A., Sodano, R., & Hillhouse, M. (2005). Assessment of amphetamine use disorders. In D.M. Donovan & G.A. Marlatt (Eds.), *Assessment of addictive behaviors* (pp. 185-214). New York: Guilford.

Rawson, R.A., Washton, A.M., Domier, C.P., & Reiber, C. (2002). Drugs and sexual effects: Role of drug type and gender. *Journal of Substance Abuse Treatment 22*(2), 103-108.

Ray, L. A., Bujarski, S., Courtney, K. E., Moallem, N. R., Lunny, K., Roche, D., ... & Miotto, K. (2015). The effects of naltrexone on subjective response to methamphetamine in a clinical sample: A double-blind, placebo-controlled laboratory study. Neuropsychopharmacology, 40(10), 2347. PMCID: PMC4538349

Reiber, C., Ramirez, A., Parent, D., & Rawson, R.A. (2002). Predicting treatment success at multiple timepoints in diverse patient populations of cocaine dependent individuals. *Drug and Alcohol Dependence, 68*, 35-48.

Rezaei, F., Emami, M., Zahed, S., Morabbi, M. J., Farahzadi, M., & Akhondzadeh, S. (2015). Sustained-release methylphenidate in methamphetamine dependence treatment: A double-blind and placebo-controlled trial. DARU Journal of Pharmaceutical Sciences, 23(1), 2. PMCID: PMC4298048

Rezaei, F., Ghaderi, E., Mardani, R., Hamidi, S., & Hassanzadeh, K. (2016). Topiramate for the management of methamphetamine dependence: A pilot randomized, double-blind, placebo-controlled trial. Fundamental & Clinical Pharmacology, 30(3), 282–289. PMID: 26751259

Richards JR, Bretz SW, Johnson EB, Turnipseed SD, Brofeldt BT, and Derlet RW, 1999a. Methamphetamine abuse and emergency department utilization. *Western Journal of Medicine,170*(4): 198-202.

Robertson, C.L., Ishibashi, K., Chudzynski, J., Mooney, L.J., Rawson, R.A., Dolezal, B.A., Cooper, C.B., Brown, A.K., Mandelkern, M.A., & London, E.D. (2016). Effect of exercise training on striatal dopamine D2/D3 receptors in methamphetamine users during behavioral treatment. *Neuropsychopharmacology, 41*(6), 1629-1636. doi: 10.1038/npp.2015.331. PMCID: PMC4832026 [Available May 1, 2017]

Roll, J. M., Madden, G. J., Rawson, R., & Petry, N. M. (2009). Facilitating the adoption of contingency management for the treatment of substance use disorders. Behavior Analysis in Practice, 2(1), 4–13. PMCID: PMC2854061

Roll, J. M., Petry, N. M., Stitzer, M. L., Brecht, M. L., Peirce, J. M., McCann, M. J.,…Kellogg, S. (2006). Contingency management for the treatment of methamphetamine use disorders. American Journal of Psychiatry 163(11):1993–1999, 2006.

Roll, J., Rawson, R., Shoptaw, S., & Ling, W. (2009). Introduction. In J.M. Roll, R.A. Rawson, W. Ling, & S. Shoptaw (Eds.), *Methamphetamine addiction: From basic science to treatment* (pp. 1-5). New York: Guilford Press.

Roll, J., Rawson, R.A, Shoptaw, S., & Ling, W. (Eds.) (2009). *Methamphetamine addiction: From basic science to treatment*. New York: Guilford Press.

Romanelli, F., & Smith, K. M. (2006). Clinical effects and management of methamphetamine abuse. Pharmacotherapy: The Journal of Human Pharmacology & Drug Therapy. 26(8), 1148–1156. PMID:16863490

Roozen, H. G., Boulogne, J. J., Van Tulder, M. W., Van den Brink, W., De Jong, CA., & Kerkhof, A. J. (2004). A systematic review of the effectiveness of the community reinforcement approach in alcohol, cocaine and opioid addiction. Drug and Alcohol Dependence, 74(1), 1–13. PMID: 15072802

Rothman, R. B., Gorelick, D. A., Heishman, S. J., Eichmiller, P. R., Hill, B. H., Norbeck, J., & Liberto, J. G. (2000). An open-label study of a functional opioid κ antagonist in the treatment of opioid dependence. Journal of Substance Abuse Treatment, 18(3), 277–281. PMID: 10742642

Runarsdottir, V., Hansdottir, I., Tyrfingsson, T., Einarsson, M., Dugosh, K., Royer-Malvestuto, C.,... & Woody, GE. (2017). Extended-release injectable naltrexone (XR-NTX) with intensive psychosocial therapy for amphetamine dependent persons seeking treatment: A placebo-controlled trial. Journal of Addiction Medicine, 11(3), 197. PMCID: PMC5449233

Russo-Neustadt, A. A., Beard, R. C., Huang, Y. M., & Cotman, C. W. (2000). Physical activity and antidepressant treatment potentiate the expression of specific brain-derived neurotrophic factor transcripts in the rat hippocampus. *Neuroscience, 101*(2), 305–312. doi:10.1016/s0306-4522(00)00349-3

Saeed, S. A., Cunningham, K., & Bloch, R. M. (2019). Depression and anxiety disorders: Benefits of exercise, yoga and meditation. *American Family Physician, 99*(10), 620–627. PMID:31083878

Schmitz, J. M., Stotts, A. L., Rhoades, M., & Grabowski, J. (2001). Naltrexone and relapse prevention treatment for cocaine-dependent patients. Addictive Behaviors, 26(2), 167–180. PMID: 11316375

Schuckit MA, 2006. Comorbidity between substance use disorders and psychiatric conditions. *Addiction 101* Suppl 1:76-88.

Seifert, T., Brassard, P., Wissenberg, M., Rasmussen, P., Nordby, P., Stallknecht, B.,…Secher, N. H. (2010). Endurance training enhances BDNF release from the human brain. *American Journal of Physiology: Regulatory, Integrated and Comparative Physiology, 298*, R372–R377. doi: 10.1152/ajpregu.00525.2009

Seth, P., Scholl. L., Rudd, R. A., & Bacon, S. (2018). Overdose deaths involving opioids, cocaine, and psychostimulants – United States, 2015-2016. Morbidity and Mortality Weekly Report (MMWR), March 30, 2018, 67(12), 349–358.

Shen, X., Orson, FM., & Kosten, TR. (2011). Anti-addiction vaccines. F1000 Medicine Reports, 3. PMCID: PMC3186043

Shetty, V., Mooney, L.J., Zigler, C.M., Belin, T.R., Murphy, D., & Rawson, R. (2010). The relationship between methamphetamine use and increased dental disease. *Journal of the American Dental Association, 141*, 307-318. PMCID: PMC2947197

Shirado, O., Doi, T., Akai, M., Hoshino, Y., Fujino, K., Hayashi, K.,…Iwaya, T. (2010). Multicenter randomized controlled trial to evaluate the effect of home-based exercise on patients with chronic low back pain: The Japan low back pain exercise therapy study. *Spine, 35*(17), E811–E819. doi: 10.1097/BRS.0b013e3181d7a4d2

Shoptaw S, Peck J, Reback CJ, Rotheram-Fuller E, 2003. Psychiatric and substance dependence comorbidities, sexually transmitted diseases, and risk behaviors among methamphetamine-dependent gay and bisexual men seeking outpatient drug abuse treatment. *J Psychoactive Drugs 35* Suppl 1:161-8.

Shoptaw, S., Heinzerling, K. G., Rotheram-Fuller, E., Kao, U. H., Wang, P. C., Bholat, M. A., & Ling, W. (2008). Bupropion hydrochloride versus placebo, in

combination with cognitive behavioral therapy, for the treatment of cocaine abuse/dependence. Journal of Addictive Diseases, 27(1), 13–23. PMID: 18551884

Shoptaw, S., Heinzerling, K. G., Rotheram-Fuller, E., Steward, T., Wang, J., Swanson, A. N., ... & Ling, W. (2008). Randomized, placebo-controlled trial of bupropion for the treatment of methamphetamine dependence. Drug and Alcohol Dependence, 96(3), 222–232. PMCID: PMC3652530

Shoptaw, S., Rawson, R.A., Worley, M., Lefkowith, S., & Roll, J.M. (2009). Psychosocial and behavioral treatment of methamphetamine dependence. In J.M. Roll, R.A. Rawson, W. Ling, & S. Shoptaw (Eds.), *Methamphetamine addiction: From basic science to treatment* (pp. 185–201). New York: Guilford Press.

Shoptaw, S., Watson, D.W., Reiber, C., Rawson, R.A., Montgomery, M.A., Majewska, M.D., & Ling, W. (2005). Randomized controlled pilot trial of cabergoline, hydergine and levodopa/carbidopa: Los Angeles Cocaine Rapid Efficacy Screening Trial (CREST). *Addiction, 100*(Suppl. 1), 78-90.

Sim, T., Simon, S., Domier, C.P., Richardson, K., Rawson, R.A., & Ling, W. (2002). Cognitive deficits among methamphetamine users with attention deficit hyperactivity disorder symptomatology. *Journal of Addictive Diseases*, *21*(1), 75-89.

Simon S. L., Dean A. C., Cordova, X., Monterosso J. R., & London E. D. (2010). Methamphetamine dependence and neuropsychological functioning: Evaluating change during early abstinence. Journal of Studies on Alcohol and Drugs, 71(3), 335–344. PMCID: PMC2859784

Simon SL, Dacey J, Glynn S, Rawson R, Ling W, 2004. The effect of relapse on cognition in abstinent methamphetamine abusers. *J Subst Abuse Treat 27*(1):59-66

Simon, S. L., Domier, C. P., Sim, T., Richardson, K., Rawson, R. A., & Ling, W. (2002). Cognitive performance of current methamphetamine and cocaine abusers. *Journal of Addictive Diseases, 21*(1), 61–74. PMID:11831501

Simon, S.L., Domier, C., Carnell, J., Brethen, P., Rawson, R.A., & Ling, W. (2000). Cognitive impairment in individuals currently using methamphetamine. *American Journal on Addictions, 9*(3), 222-231.

Simon, S.L., Richardson, K., Dacey, J., Glynn, S., Domier, C., Rawson, R.A., & Ling, W. (2002). A comparison of patterns of methamphetamine and cocaine use. *Journal of Addictive Diseases, 21*(1), 35-44.

Sinha, R., Garcia, M., Paliwal, P., Kreek, M. J., & Rounsaville, B. J. (2006). Stress-induced cocaine craving and hypothalamic-pituitary-adrenal responses are predictive of cocaine relapse outcomes. *Archives of General Psychiatry, 63*(3), 324–331. doi:10.1001/archpsyc.63.3.324

Smid MC, Metz TD, Gordon AJ. Stimulant Use in Pregnancy: An Under-recognized Epidemic Among Pregnant Women. Clin Obstet Gynecol. 2019 Mar;62(1):168-184. doi: 10.1097/GRF.0000000000000418. PMID: 30601144; PMCID: PMC6438363.

Smits, J. A., Berry, A. C., Rosenfield, D., Powers, M. B., Behar, E., & Otto, M. W. (2008). Reducing anxiety sensitivity with exercise. *Depression and Anxiety, 25*(8), 689–699. doi: 10.1002/da.20411

Sommers I, Baskin D, Baskin-Sommers A. 2006. Methamphetamine use among young adults: health and social consequences. *Addictive Behav 31*(8): 1469-76.

Spear, S., Crèvecoeur, D.A., Rawson, R.A., & Clark, R. (2007). The rise in methamphetamine use among American Indians in Los Angeles County. *American Indian and Alaska Native Mental Health Research, 14*(2), 1-15.

Stein, M. D., Herman, D. S., & Anderson, B. J. (2009). A motivational intervention trial to reduce cocaine use. Journal of Substance Abuse Treatment, 36(1), 118–125. doi: 10.1016/j.jsat.2008.05.003. PMID: 18657938

Stoutenberg, M., Rethorst, C. D., Lawson, O, & Read. J. P. (2016). Exercise training—A beneficial intervention in the treatment of alcohol use disorders? *Drug and Alcohol Dependence, 160*, 2–11. doi: 10.1016/j.drugalcdep.2015.11.019

Ströhle, A., Graetz, B., Scheel, M., Wittmann, A., Feller, C., Heinz, A., & Dimeo, F. (2009). The acute antipanic and anxiolytic activity of aerobic exercise in patients with panic disorder and healthy control subjects. *Journal of Psychiatric Research, 43*(12), 1013–1017. doi: 10.1016/j.jpsychires.2009.02.004

Su, H., Zhong, N., Gan, H., Wang, J, Han, H., Chen, T.,…Zhao, M. (2017). High frequency repetitive transcranial magnetic stimulation of the left dorsolateral prefrontal cortex for methamphetamine use disorders: A randomised clinical trial. Drug and Alcohol Dependence, 175, 84–91. doi: 10.1016/j.drugalcdep.2017.01.037. PMID: 28410525

Substance Abuse and Mental Health Services Administration. (2018). Key substance use and mental health indicators in the United States: Results from the

2017 National Survey on Drug Use and Health (HHS Publication No. SMA 18-5068, NSDUH Series H-53). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from https://www.samhsa.gov/data/

Tate, S. R., Wu, J., McQuaid, J. R., Cummins, K., Shriver, C., Krenek, M., & Brown, S. A. (2008). Comorbidity of substance dependence and depression: Role of life stress and self-efficacy in sustaining abstinence. *Psychology of Addictive Behaviors, 22*(1), 47–57. doi: 10.1037/0893-164X.22.1.47

Taylor, R. S., Unal, B., Critchley, J. A., & Capewell, S. (2006). Mortality reductions in patients receiving exercise-based cardiac rehabilitation: how much can be attributed to cardiovascular risk factor improvements? *European Journal of Cardiovascular and Prevention and Rehabilitation, 13*(3), 369–374. doi:10.1097/01.hjr.0000199492.00967.11

Terraneo, A., Leggio, L., Saladini, M., Ermani, M., Bonci, A., & Gallimberti, L. (2016). Transcranial magnetic stimulation of dorsolateral prefrontal cortex reduces cocaine use: A pilot study. European Neuropsychopharmacology, 26(1), 37–44. doi: 10.1016/j.euroneuro.2015.11.011.

Tiihonen, J., Kuoppasalmi, K., Föhr, J., Tuomola, P., Kuikanmäki, O., Vorma, H.,... & Meririnne, E. (2007). A comparison of aripiprazole, methylphenidate, and placebo for amphetamine dependence. American Journal of Psychiatry, 164(1), 160–162.

Tran, L.T., Rehm, J., Torrens, M., Shoptaw, S., 2019. Responding to global stimulant use: challenges and opportunities. Lancet. 394, 1652-1667. doi: 10.1016/S0140 6736(19)32230-5.

Trivedi, M. H., Greer, T. L., Rethorst, C. D., Carmody, T., Grannemann, B. D., Walker, R.,…Nunes, E. V. (2017). Randomized controlled trial comparing exercise to health education for stimulant use disorder: Results From the CTN-0037 STimulant Reduction Intervention Using Dosed Exercise (STRIDE) Study. Journal of Clinical Psychiatry, 78(8), 1075–1082. doi: 10.4088/JCP.15m10591.

Trivedi, M. H., Greer, T. L., Rethorst, C. D., Carmody, T., Grannemann, B. D., Walker, R.,…Nunes, E. V. (2017). Randomized controlled trial comparing exercise to health education for stimulant use disorder: Results from the CTN-0037 stimulant reduction intervention using dosed exercise (STRIDE) study. *Journal of Clinical Psychiatry, 78*(8), 1075-1082. doi: 10.4088/JCP.15m10591

Turnipseed SD, Richards JR, Kirk JD, Diercks DB, and Amsterdam EA, 2003. Frequency of acute coronary syndrome in patients presenting to the emergency department with chest pain after methamphetamine use. J Emerg Med 24:369-73.

U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans* (2nd ed.). Washington, DC: U.S. Department of Health and Human Services.

U.S. Department of Justice Drug Enforcement Administration. (2018). 2018 National Drug Threat Assessment. [Page 64]. Retrieved November 2018 from: https://www.dea.gov/documents/2018/10/02/2018-national-drug-threat-assessment-ndta

Ussher, M. H., Taylor, A. H., & Faulkner, G. E. (2014). Exercise interventions for smoking cessation. *Cochrane Database of Systematic Reviews, 29*(8), CD002295. doi: 10.1002/14651858.CD002295.pub5.

Venneman, S., Leuchter, A., Bartzokis, G., Beckson, M., Simon, S.L., Schaefer, M., Rawson, R., Newton, T., Cook, I.A., Uijtdehaage, S., & Ling W. (2006). Variation in neurophysiological function and evidence of quantitative electroencephalogram discordance: Predicting cocaine-dependent treatment attrition. *Journal of Neuropsychiatry and Clinical Neuroscience, 18*, 208-216.

Volkow ND. Collision of the COVID-19 and Addiction Epidemics. Ann Intern Med. 2020 Jul 7;173(1):61-62. doi: 10.7326/M20-1212. Epub 2020 Apr 2. PMID: 32240293; PMCID: PMC7138334.

Wendt, D. C., Hallgren, K. A., Daley, D. C., & Donovan, D. M. (2017). Predictors and outcomes of twelve-step sponsorship of stimulant users: Secondary analyses of a multisite randomized clinical trial. Journal of Studies on Alcohol and Drugs, 78(2), 287–295. doi:10.15288/jsad.2017.78.287. PMCID: PMC5554108

Wijetunga M, Bhan R, Lindsay J, and Karch S, 2004. Acute coronary syndrome and crystal methamphetamine use: a case series. Hawaii Med J 63:8-13.

Wise, R. Dopamine and reward: The anhedonia hypothesis 30 years on. (2008) *Neurotoxicity Research* volume 14, pages169–183.

Youngstedt, S. D. (2005). Effects of exercise on sleep. *Clinics in Sports Medicine, 24*, 355–365. doi:10.1016/j.csm.2004.12.003

Zorick, T., Nestor, L., Miotto, K., Sugar, C., Hellemann, G., Scanlon, G., Rawson, R., & London, E.D. (2010). Withdrawal symptoms in abstinent methamphetamine-dependent subjects. *Addiction*, *105*(10), 1809-1818. PM

Zschucke, E., Gaudlitz, K., & Ströhle, A. (2013). Exercise and physical activity in mental disorders: Clinical and experimental evidence. *Journal of Preventive Medicine and Public Health, 46*, S12-S21. doi: https://doi.org/10.3961/jpmph.2013.46.S.S12