Questions Asked During Live Webinar Broadcast on 12/18/19

Successful Treatment of Methamphetamine Addiction
Presenter: Cardwell “C.C.” Nuckols, PhD

What would be the ideal course of treatment for someone who struggled for 3 years + with regular meth use?
A: There are many variables to consider—history of treatment failure, co-occurring disorders and diseases including trauma-related, absence or presence of recovery capital, stage of change, developmental issues requiring habilitation, etc. If in need of habilitation, a long-term association with persons with secure attachments (sponsors, staff as family, etc.) will help with neurogenesis and neuroplasticity. So an extended intensive phase would be helpful along with discharge planning to prevent “cracks” in transition. For some, extended treatment up to 6-12 months like Alina Lodge or Burning Tree. For those in need of rehabilitation (i.e. well-developed prefrontal cortex) an intensive initial phase followed by self-help and follow-up is a good start. If that level is ineffective, a more structured and longer approach is warranted.

Can you please explain Acute Abstinence Syndrome (AAS) more detail?
A: Chronologically, one goes from toxicity (high) to crash (coming down from high but not so much as to cause AAS) to acute abstinence syndrome (withdrawal) to post-acute withdrawal (stress related symptoms occurring after the acute phase is over)

Remember, that each drug has a different half-life and/or other factors such as genetics and lipid solubility that help determine how long the drug stays in the body and when the AAS will begin.

If you look at the meth handout you can notice the various phases and symptoms related to each...
METHAMPHETAMINE TOXICITY

- **INCREASED LEVELS OF NOREPINEPHRINE AND DOPAMINE**
  - Hyperarousal
  - Pleasure
  - Paranoia

- **INCREASED LEVELS OF SEROTONIN**
  - Reduced Hunger
  - Insomnia

METHAMPHETAMINE CRASH

- **REDUCED LEVELS OF NOREPINEPHRINE AND DOPAMINE**
  - Dysphoria
  - Depression
  - Anhedonia

- **REDUCED LEVELS OF SEROTONIN**
  - Mood swings
  - Sleep disturbances
Can you go over the models you recommended for methamphetamine treatment?

- A:
  Careful assessment needed to confirm need for habilitation vs. rehabilitation, recovery capital, stage of change and other factors that can complicate recovery (negative environment, trauma, self-injurious behavior, etc.). Models that match the patient’s subjective experience, start where the patient is and use patient strengths to help strengthen weaknesses work best.

MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY is an incentive based approach that is garnering positive results in research studies over the past 20 or more years. The most effective treatments for methamphetamine addiction at this point are behavioral therapies, such as cognitive-behavioral and contingency-management interventions.

The following Habilitation Model works to develop areas of the brain that underlie patient weakness in the areas of relationships, affect control and cognitive abilities (executive function). By developing the brain the substrate for the changes exist.
DEVELOPING THE PREFRONTAL CORTEX

• There are three areas that make up the prefrontal cortex (PFC) and its link to the limbic system
  - ORBITOFRONTAL CORTEX (VENTROMEDIAL PFC)
    - AFFECT CONTROL
    - WEIGHING DECISIONS
  - DORSOLATERAL PREFRONTAL CORTEX
    - EXECUTIVE FUNCTIONS
    - MORAL JUDGMENTS
  - ANTERIOR CINGULATE GYRUS
    - RELATIONAL
    - ATTENTION AND FOCUS

DEVELOPING THE PREFRONTAL CORTEX

• Research tells us…
  - We can impact the areas of relationships, affective control and cognitive abilities
  - RELATIONSHIPS (ATTACHMENT) = ANTERIOR CINGULATE CORTEX
  - AFFECTIVE CONTROL = ORBITOFRONTAL CORTEX
  - COGNITION = DORSOLATERAL PREFRONTAL CORTEX

The two slides point to the fact that prefrontal cortex (requiring around 25 years under general healthy conditions) relates to these areas are contributions to relationships, affective control and advanced cognition. What I then did was to look at various techniques, approaches, etc. that would enhance the development of these prefrontal areas giving the patient the capacity to continue to develop skills like affect control and relationship abilities. Here is an example.
EMOTIONAL DEVELOPMENT

- The core features of emotional development include the ability to identify and understand one’s own feelings, to accurately read and comprehend emotional states in others, to manage strong emotions and their expression in a constructive manner, to regulate one’s own behavior, to develop empathy for others, and to establish and maintain relationships.

- Emotions can change how much control you have. So, when you look at the medial and orbital surfaces of the frontal lobe, which some call the ‘social’ brain, the mean age of myelination of those connections between the limbic system and those frontal areas is about 32.

DEVELOPING THE PREFRONTAL CORTEX

- **AFFECTIVE CONTROL**
  - Role play
    - How to manage potential relapse and craving situations
      - People, Places and Things (PPT) group
  - Other structured groups ("Drop the Rock" for example)
  - Anger management
    - How when I get angry I give up control to the person I claim is making me angry
  - Spiritual
    - Each day a patient reads from a chosen passage from a spiritual text (AA, NA, Bible, Koran, Bhagavad Gita, Tao, etc. purchased as library)
    - Utilizing the right hemisphere to be in the present and to appreciate beauty

PEOPLE, PLACES AND THINGS WORKSHEET

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What are the benefits of having a Peer Recovery Coach?

A: Recovery coaches are not therapists, nor do they work specifically to treat drug or alcohol addiction. Instead, they work within a model similar to motivational therapy, assessing and encouraging positive actions toward the aim of a successful long-term recovery. Individuals leaving therapy may benefit from having a recovery coach.

A recovery coach can be invaluable to someone who wants to get free from addiction but may have struggled in the past with relapse. The benefits of having a recovery coach when leaving treatment include a higher rate of success in staying in recovery beyond two years, constant access to someone with the training and understanding of what addiction is and how it affects us, who can walk you through hard-hitting cravings, and they are attuned to the signs of relapse and may be able to help someone get help before relapse occurs.
One recent study indicated that individuals who received some kind of post-recovery checkup at regular intervals in the two years following treatment saw a lower rate of relapse. One study examining individuals who had relapsed previously found that those with recovery coaches stay in treatment, and are 15 percent more likely to remain in recovery at two years, than those who did not have a recovery coach. While 15 percent does not seem like a huge number, for someone prone to relapse, it demonstrates the effectiveness of recovery coaching over regular therapy used without added coaching.

Recovery Coaching through peer to peer support is considered a best practice by the Substance Abuse and Mental Health Services Administration (SAMHSA). Research shows that peers have a significant impact on improves treatment and continuing care outcomes. Peer support services have been shown to:

- Reduce symptoms and hospitalizations
- Increase social support and participation in the community
- Decrease lengths of hospital stays and costs of services
- Improve well-being, self-esteem, and social functioning
- Encourage more thorough and longer-lasting recoveries

A recovery coach is different from a sponsor or peer mentor and having one doesn’t mean you can’t also have the other. Though both are similar in their aim in helping you achieve your recovery goals, a recovery coach is a trained, paid professional with an understanding of the tools available for helping someone maintain and achieve recovery. They are also not limited to recovery goals, but any positive goals that will benefit the individual as long as they do not interfere with recovery.

What would be best approach for a Meth addicted patient in an acute hospital setting, which typically is a short stabilization stay?

A: Is intervention possible using family, friends, etc.? Is there availability of trained addictionologist or clinicians who can work with the patient?
Work on motivation (motivational interviewing) to continue treatment post discharge. If successful, a direct referral to a treatment program.

Knowing that AAS from meth is from days to two weeks. It is typical for the meth addict to leave the hospital still in withdrawal and relapses immediately or sooner.

Are there differences in the psychosis from use vs withdrawal?

There can be some differences from psychotic episode to psychotic episode whether from toxicity or recovery.

Wang et al, (2015) found similar patterns of delusions common in patients with schizophrenia among those with methamphetamine-induced psychoses. Moreover, when compared with schizophrenic patients, those with methamphetamine-induced psychosis present a higher prevalence of visual and tactile hallucinations but less cognitive disorganization, blunted affect and motor retardation. Some symptoms of methamphetamine psychosis may result from “tweaking.” Several studies have found that methamphetamine psychosis goes away when a person stops taking the drug. However, the National Institute on Drug Abuse (NIDA) notes that methamphetamine psychosis symptoms may persist for months or years in some people. Stress can trigger a reoccurrence of these symptoms long after methamphetamine is cleared from the body.

My belief is that for most the symptoms clear with time but can be present when patient under stress in recovery. For others, there is a genetic predisposition to a psychotic disorder such a schizophrenia and meth is a environmental precipitating factor. On occasion have seen an erratic psychotic history during use and a more stable schizophrenia symptomatology during recovery.

Psychotic symptoms and syndromes are frequently experienced among individuals who use methamphetamine, with recent estimates of up to approximately 40% of users affected. Though transient in a large proportion of users, acute symptoms can include agitation, violence, and delusions, and may require management in an inpatient psychiatric or other crisis intervention setting. In a subset of individuals, psychosis can recur and persist and may be
difficult to distinguish from a primary psychotic disorder such as schizophrenia. Differential diagnosis of primary versus substance-induced psychotic disorders among methamphetamine users is challenging; nevertheless, with careful assessment of the temporal relationship of symptoms to methamphetamine use, aided by state-of-the art psychodiagnostic assessment instruments and use of objective indicators of recent substance use (i.e., urine toxicology assays), coupled with collateral clinical data gathered from the family or others close to the individual, diagnostic accuracy can be optimized and the individual can be appropriately matched to a plan of treatment. The pharmacological treatment of acute methamphetamine-induced psychosis may include the use of antipsychotic medications as well as benzodiazepines, although symptoms may resolve without pharmacological treatment if the user is able to achieve a period of intervention setting. In a subset of individuals, psychosis can recur and persist and may be difficult to distinguish from a primary psychotic disorder such as schizophrenia.

Theories are quite similar, nevertheless, necessitating the following practices: (a) close monitoring for the development of chronic or recurrent psychosis among those who present transient symptoms; (b) possible pharmacological management of acute symptoms, and (c) behavioral treatment and psychoeducation addressing MA use and its association with psychosis.

The recurrent nature of MA psychosis is another feature that is similar to the clinical course of schizophrenia. In a review of studies relating to the first and second epidemics of MA abuse in Japan, Sato (Sato M. Acute exacerbation of methamphetamine psychosis and lasting dopaminergic supersensitivity. A clinical survey. Psychopharmacol Bull. 1986;22(3):751–56 and Sato M, Chen CC, Akiyama K, Otsuki S. Acute exacerbation of paranoid psychotic state after long-term abstinence in patients with previous methamphetamine psychosis. Biol Psychiatry. 1983;18(4):429–40) reported that during the second epidemic, nearly 50% of those admitted to the hospital for MA psychosis had experienced this condition previously with the most extreme cases having been readmitted for treatment of MA psychosis more than 10 times. A number of studies have examined risk factors for recurrent MA-induced psychoses, with identified triggers including MA use or resumption of use even in relatively small amounts following protracted abstinence, other substance use, including heavy alcohol use, even in the absence of MA use [Sato M. A lasting vulnerability to psychosis in patients with previous methamphetamine psychosis. In: Kalivas PW, Samson HH, editors. Ann NY Acad Sci. Vol. 654. 1992. pp. 160–70. The neuropsychology of drug and alcohol addiction.; sleep deprivation, and psychosocial stressors [Yui K, Goto K, Ikemoto S, Nishijima K, Yoshino T, Ishiguro T. Susceptibility to subsequent episodes of spontaneous recurrence of methamphetamine psychosis. Drug Alcohol Depend. 2001;64:133–42]. When MA use triggers re-occurrence of psychosis, the symptom presentation tends to remain the same as in prior episodes. Moreover, under these conditions, the latency from MA use to psychosis onset can be remarkably brief (i.e., within less than a week), relative to that observed in the initial MA-induced psychosis episode. The propensity for MA use to trigger psychosis among individuals who have previously experienced psychotic symptoms can persist for years, and has been described as a MA “sensitization” or “reverse-tolerance” effect.
STIMULANT PSYCHOSIS

- Chronic methamphetamine use causes neuroadaptive/pathological changes in the brain, including numerous cognitive deficits plus mood, thought and behavioral disorders, the worst of which is psychosis. Research by Wang et al, (2015) found similar patterns of delusions common in patients with schizophrenia among those with methamphetamine-induced psychoses. Moreover, when compared with schizophrenic patients, those with methamphetamine-induced psychosis present a higher prevalence of visual and tactile hallucinations but less cognitive disorganization, blunted affect and motor retardation.

STIMULANT PSYCHOSIS

- Because of the high toxicity of meth, the debilitating effects often persist after extended periods of abstinence. As a result, the cognitive deficits (which are not easy to detect in abstinence) affect how individuals respond to treatment, which is a highly didactic and educational experience. Therefore, treatment modalities and interventions must be tailored to address the individuals’ unique cognitive and emotional deficits and co-occurring psychiatric and medical disorders.

STIMULANT PSYCHOSIS

• Mimics Paranoid Schizophrenia and the delusions closely resembles Delusional (Paranoid) Disorder types (see next slide)
  - Erotomanic Type
  - Jealous Type
  - Persecutory Type
  - Somatic Type
  - Grandiose Type

• Meth induced psychotic symptoms may include:
  - Hallucinations (auditory, visual, olfactory, tactile, or gustatory)
  - Delusions (grandeur, persecution, jealous, somatic)
  - Obsessive behavior

STIMULANT PSYCHOSIS

• Hallucinations from methamphetamine psychosis are most commonly visual and auditory but may affect other senses as well. Hallucinations may be:
  - Visual (sight): seeing something that is not real, like people who aren’t there
  - Auditory (sound): hearing a noise that is not made, like voices giving commands
  - Olfactory (smell): smelling an odor that is not being emitted, like smoke without a fire
  - Tactile (touch): feeling something imaginary, like bugs beneath the skin (formication)
  - Gustatory (taste): tasting something that is not present, like poison in food
STIMULANT PSYCHOSIS

• A delusion is a false belief that does not coincide with reality. Common delusions of an individual with methamphetamine psychosis may include the belief that:
  – Someone else is controlling them
  – They are more important or more powerful than others
  – Their bodily appearance or function is abnormal
  – Random events in the world are connected and linked to their life
  – Authority figures, such as police or the government, are after them

STIMULANT PSYCHOSIS

• Hallucinations and delusions often go hand-in-hand with paranoia and obsession. A person suffering from methamphetamine psychosis may believe they are being watched or followed. They may also engage in repetitive, pointless behaviors, such as taking things apart and putting them back together.

• Some symptoms of methamphetamine psychosis may result from “tweaking.” This is a term for when a person takes methamphetamine excessively and is unable to sleep for days. Tweaking is marked by hyperstimulation and irritability that can manifest in aggressive and violent behavior.
Do pet scans reveal differences in brain structure functioning associated with each of the attachment styles? A: VERY INTERESTING QUESTION: unfortunately could not find any info on PET scans of the different styles of attachment. Will continue to look as there must something related to this Q. If researches can get money to study anxiety in pigs...
Have given information below that can help piece a little of it together.
The 9 functions of the pre-frontal cortex are:

1. regulation of body – SNS-PNS balance
2. attuned communication, felt sense of other’s experience
3. regulation of emotions
4. response flexibility – pause, options, evaluate options, appropriate decision
5. empathy
6. insight – self awareness
7. fear extinction – GABA fibers to amygdala
8. intuition – deep knowing without logic
9. morality – behaviors based on empathy.

Research has shown that 7 of the 9 functions of the PFC are outcomes of secure attachment. Research also shows that all 9 functions are strengthened in mindfulness practice, internal attunement rather than interpersonal attunement. So a therapist’s mindful awareness of their own internal states strengthens the same pathways of the brain we need to become aware of another person’s internal states. (Mindfulness and psychotherapy is another article.)
The laterality of the two hemispheres of the cortex is important here. The right and left hemispheres of the brain develop at different rates and specialize in different functions, allowing a much greater complexity of functioning than if they were duplicating each other. The right hemisphere of the brain grows larger in volume and more rapidly than the left, from before birth through 18 months of age, which completely coincides with the developmental timetable of when attachment patterns are being stabilized in the brain. *These patterns of attachment are stored in our memory in the mode of RH processing.* The right hemisphere processes experience differently from the left – non-verbally through body sensations, visual images, emotions, and holistically – it processes the gestalt of someone’s face or energy globally, all at once, rather than in a linear data bit by data bit mode. The right hemisphere is where we get our “gut” intuitive sense of things and the gestalt of things as a whole. The right hemisphere is the seat of the social and personal self. The right hemisphere regulates the sub-cortical limbic system and is dominant for social-emotional processing. Our attachment patterns are stored in this mode.

The left hemisphere is developing all along but goes through a growth spurt from 18 months to three years of age and becomes dominant after that, except for a period of re-organization during adolescence when the two hemispheres battle it out for dominance. Why, with the amping up of hormones, too, adolescence is such a stormy period. This adolescent period coincides with the need for attachment patterns to change, moving the focus from leaving parents to focusing on peers and forming one’s own family. The left hemisphere of the brain processes logically, linearly, linguistically, through symbols and words; it is dominant for cognitive processing.

Remember, both hemispheres do process experience consciously, it’s just that what comes to consciousness in the right hemisphere is images, sensations, emotions and what comes to consciousness in the left is words and symbols. The right hemisphere decodes our relationship experience; the left hemisphere describes it.

Because the right hemisphere develops early and the left hemisphere develops later, and because the right hemisphere is more neuronally connected to the limbic system than the left, it has a negative bias toward anxiety, shame, depression and withdrawal, which can impact our experience of attachment and make it harder to change those patterns. There is a corresponding bias in the left hemisphere toward positive emotions, humor and mania, and approach.

“An unfortunate artifact of the evolution of laterality may be that the right hemisphere, biased toward negative emotions and pessimism, develops first and serves as the core of self-awareness and self-identity. To be human may be to have vulnerability toward shame, guilt and depression. So although both sides of the brain are involved in emotion, the dominant role of the right hemisphere in defensive and negative emotions gives it executive “veto power” over the left. Just as the left can block emotional and visceral input from the right, the right can override conscious processing and emotional well-being in reaction to threat.” [Cozolino p. 78] Think about this for ourselves and our clients.

The corpus collosus, running right down the middle of the brain front to back, is what begins to integrate the information between the right hemisphere and the left hemisphere at about 12 months of age. What’s important about any of this brain functioning is integration. The brain is about teamwork; various parts of the brain firing together in synchrony There is bottom-up information from the limbic system about the emotional charge of any
experience and top-down regulation of our reflexes and emotions; there is right left integration of feelings and thoughts, integration of positive and negative responses. The more integrated neural pathways, networks, structure are, the better the brain functions

2. How attachment shapes the brain and what patterns of attachment are embedded in the neural circuitry of the brain that shape our 3 R’s, relating, regulation of affect, and resilience, for the rest of our lives.
Dan Siegel has proposed a **resonance circuit in the brain**.
* Various structures cooperating with each other

* to support the processes of interpersonal resonance, attunement, and empathy * that activate neurons in the limbic regions and the middle pre-frontal cortex

* and stimulate neurons there to fire together, wire together

* and strengthen the synaptic connections for the circuits and pathways

* that become our internal working models, templates, schemas, mental representation of self and other in relationship.

This resonance circuit begins with sensory input – what we see, hear, smell, touch of another. Then mirror neurons, which were discovered in the cortex at the crossroads of visual, motor, emotional processing, communication, language, cohesion and empathy not even a decade ago, fire when I observe and comprehend an intentional behavior in you. The exact same neurons fire in my brain as are firing in your brain when I observe the intention of the behavior you are doing, or when I imagine myself doing it. If you make a random gesture of moving your hand toward your mouth, nothing much happens. If you pick up a glass of water and move it toward your mouth, the same neurons are firing in my brain as I perceive and comprehend your intention as are firing in your brain as you do that intentional behavior.

When we are attuning to another’s behavior and expressions of intention – facial expressions, body gestures, tone of voice, mirror neurons fire in our brain. Information from these mirror neurons travels from the cortex of our brain through the insula – a structure buried deeply in our brain that is located at the interface of the cortex and the limbic regions. The insula carries information down from the cortex through the limbic regions to the neurons of interoception – how we sense what is happening internally in our bodies. The information gathered through interoception, tension, tightness, tiredness, travels back up through the insula through the limbic regions where the sensations are given emotional meaning, back up to the structures of the middle pre-frontal cortex. **The insula integrates somatic experience with conscious awareness. We feel pain when another feels pain.** Cozolino notes that this insula, though a very small part of the brain, is an evolutionary masterpiece.
Remember one of the 9 functions of the pre-frontal cortex is attunement – we interpret our felt sense of the other’s experience. Another function of the PFC is empathy – to communicate that felt sense, nonverbally being even more important than verbally. This resonance circuit is essential to stimulating growth of all 9 functions of...
the PFC, including regulation of body, regulation of emotion, extinguishing fear, response flexibility, self awareness etc.

This resonance circuit operates in the brain of the parent attuning to his or her child; it’s what stimulates the developing brain of the infant to process and know its own experience; its experience metabolized and reflected back by the parent becomes encoded in the infant’s neural circuitry. Because you know what’s in my mind and heart, I can know it, too. These patterns do stabilize in the brain by 18 months of age, rendering them as Cozolino says, of permanent psychological significance.

This resonance circuit operates in us as therapists as we attune to our clients. And clients experiencing us attuning to them as they share their experience are also receiving our unconditional acceptance of that experience which re-wires their sense of it and their sense of self.

This resonance circuit helps us understand the neurobiology operating in the development of each of the four styles of attachment identified over 40 years of attachment research. How relational experiences, the meaning the developing brain gives those experiences, create conclusions or models of how life works. These models create anticipations of what to expect in the future which shapes, filters, distorts our perceptions and response which can reinforce our conclusions. None of this is an issue if attachment is secure, but this process is very much an issue if attachment is less than secure. These distortions become the Truth of the Way Things Are. They become defenses which block learning and prevent change.

Mary Ainsworth at the University of Virginia identified three styles of attachment that have since been proven to be universal across cultures: secure, insecure-avoidant, insecure-anxious. Mary Main and Erik Hesse of U.C. Berkeley discovered a fourth less common style – disorganized – occurring within the other three styles rather than all the time.

What’s happening in the brain as these attachment styles operate in adult life?
When a person is experiencing the safety of a secure attachment relationships there is no over-arousal of the sympathetic nervous system; everything is OK and humming along. There is a flexible balance of stimulation – vitality – and regulation – calm or ease. When there is insecure attachment – either style – there IS arousal of the SNS. Relationships mean danger, so the brain prepares for flight or fight.
In insecure-avoidant attachment, the coping mechanisms of avoidance, withdrawal, minimizing, focusing externally, over-regulate the body and any emotional signals that might come through. There is flight from feelings and people. There is a shutting down of core affect, a de-valuing the importance of relationship. A person may be functioning well in the outside world but clueless about interpersonal interactions or even their own inner world. They can present as under-stimulated and over-regulated.
In insecure-anxious attachment, the sympathetic nervous system is over-stimulated and under-regulated. The personal can feel flooded with stress, fear of abandonment, panic and not be able to self regulate enough, not enough calming of the parasympathetic nervous system. There is energy for fight; people engage through anger aggression.
In disorganized attachment, “fright without solution,” there can be such a sense of danger or life threat, even the momentum of the amygdala, the fight-flight response, collapses. Only the brainstem is operating. The parasympathetic nervous system over-regulates bodily energy to the point of paralysis and helplessness. Clients can appear catatonic.

What clinicians need to face directly in healing attachment trauma is that the coping strategies in less than secure patterns of attachment are defensive – they create *barriers to emotion*, to the full range of human emotions that are important signals of what to pay attention to in our lives and in others’ lives. They create *barriers to the skillful regulation of emotion*, creating avoidance or flooding rather than skillful experiencing, processing, managing, moving through. They create *barriers to healthy relating*, if relating is going to trigger unbearable emotions of fear, shame, loneliness, despair. So clients regulate closeness-distance by dismissing, focusing on self rather than other, or clinging, focusing on other rather than self, or by losing focus altogether, rather than flexibly focusing on self and other, the hallmark of secure attachment.

Why Allan Schore said “The security of the attachment bond is the primary defense against psychopathology.”

Because our brains are social brains, developing most efficiently in interactions with other brains, it’s essential that clients hang out with other healthy brains besides you one hour a week in the consulting room. Mary Main and Erik Hesse discovered that if one partner in a relationship has a secure attachment style, the other less-than-secure partner can grow into earned secure attachment in 3-5 years without therapeutic intervention. We are learning how to accelerate that process.

Wondering about medication assisted therapies that could be effective when working with those with Methamphetamine Disorders?

A: Mostly symptom based. As an example, here is symptom-based treatment of sleep problems (often found in methamphetamine addicts in early recovery).
SLEEP

• PHARMACOTHERAPY
  - Melatonin—a metabolite of serotonin is a hormone secreted by the pineal gland; plays a role in maintenance of sleep-wake cycle (suprachiasmatic nucleus)
  - Valerian (could damage the liver)
  - Tryptophan—precursor amino acid to serotonin
  - Antidepressants—Trazodone is a popular choice although not backed by formal clinical studies
  - Quetiapine (Seroquel) and gabapentin (mixed results)

SLEEP

• PHARMACOTHERAPY
  - Many over-the-counter sleep medications contain antihistamines that cause sedation. They are not recommended as a long-term treatment for insomnia because they negatively affect the natural sleep cycle and have side effects such as morning grogginess, daytime sleepiness, and impaired alertness and judgment. Furthermore, evidence supporting their long-term effectiveness is insufficient.
In regard to pharmacological treatment of meth addiction, there is no medication that treats the addiction but are mainly for symptom relief.

Considering all of the problems a person will be having after stopping, when can you start doing more than helping them not lapse? Also, where do you get the money to pay for incentives and the enriched environment for a client who is on Medicaid and is poor and sometimes homeless?

A: You are certainly where the action is! May God bless you and your work.

You might consider setting up the contingencies as follows:
MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY

- Start with attendance incentive
  - to improve early engagement

- Shift to abstinence
  - after attendance well established

- Shift to life-style change goals
  - after abstinence well established

This is more workable as they are initially incentivized by just showing up and then to abstinence and then to change lifestyle. “Wrap around” services like housing, medical and/or mental health treatment will be needed.

An enriched environment in this case could be spending time with healthy persons such as yourself, a sponsor or friends in recovery, a drop in center self-help meetings, churches or siblings. An encouraging and nonjudgemental sibling can be of immense support. Even starting a meeting or two for the group is a great idea. This is mostly about time and effort.


Clinics in Spain, Canada and the USA have reported that some or most of the reinforcers for contingency management can be obtained via community donations. (Garcia-Rodriguez O, Secades-Villa R, Higgins ST, Fernandez-Hermida JR, Carballo JL. Financing a voucher program for cocaine abusers through community donations in Spain. J Appl Behav Anal 2008. ; 41:623 -8). These approaches may be particularly advantageous with respect to raising funds for highly vulnerable populations, such as pregnant women, adolescents, people with HIV, homeless individuals, and those with severe and persistent mental health disorders.

Do you have access to a grant writer? It is critical this person really knows how to put the grant proposal together. Do not know much about grant writing so ask around for help. A nice site is https://grants.nih.gov/grants/funding/funding_program.htm. Please check it out as it will let you know about National Institute of Health (NIH) and related grants.
Why do we think that the incentive-based behavioral interventions work the best?
A: It is research driven or evidence-based. It has been shown to enhance group attendance and for retention in treatment.

Contingency management is an addiction treatment approach that rewards clients for positive behaviors. This therapy has shown effectiveness in treating drug and alcohol abuse, improving rehab attendance and helping people achieve treatment goals.

PSYCHOLOGICAL TREATMENT

• The most effective treatments for methamphetamine addiction at this point are behavioral therapies, such as cognitive-behavioral and contingency-management interventions.

• Motivational Incentives for Enhancing Drug Abuse Recovery (MIEDAR), an incentive based method for promoting cocaine and methamphetamine abstinence, has demonstrated efficacy in methamphetamine abusers through NIDA’s National Drug Abuse Clinical Trials Network.

MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY

• The study will determine if motivational incentives along with standard care therapy is more effective than standard therapy alone for the treatment of patients using cocaine or methamphetamine and entering a substance abuse treatment program (Stitzer, et. al. MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY: METHADONE CLINICS. NIDA-CTN-0007, December 6, 2000).

• The study utilizes a two group random assignment design. Thus, interested and eligible participant volunteers will be assigned to receive usual care or usual care supplemented by a motivational incentive program.
MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY

• Those subjects in the motivational incentive group will be given the opportunity to receive tangible incentives twice weekly based on drug-free urine test results. Each time a participant tests negative they will be able to make recovery picks from the abstinence bowl. Some picks will result in no incentive award. Some picks will result in receipt of a “small” incentive such as a soda, candy bar or toiletry item. Yet other picks may result in receipt of a larger incentive such as a radio or gift certificate to a local restaurant, grocery or retail store.

MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY

• RESULTS
  – RETENTION IN TREATMENT FOR THE 12 WEEK PROGRAM
    – Control group- 35%
    – Incentive Group- 50%
  – GROUP ATTENDANCE
    – Control group- 52%
    – Incentive Group- 76%
MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY

• Use negative urine as objective evidence
• Collect urines frequently
• Test on-site (immediate feedback)
• Provide immediate rewards for negative UA
  – Vouchers or drawing for prizes

MOTIVATIONAL INCENTIVES FOR ENHANCED DRUG ABUSE RECOVERY

• Principle of alternative reinforcement:
  – Making abstinence today a more attractive option
• Points earned for cocaine negative urine results
  – Escalating schedule of point earnings
  – Trade in points for goods
  – $1000 available over 3 months

Steve Higgins
A contingency approach to management is based on the theory that management effectiveness is contingent, or dependent, upon the interplay between the application of management behaviors and specific situations. In other words, the way you manage should change depending on the circumstances.

Contingency management interventions (CM) are most widely used in the field of substance abuse, often implemented as part of clinical behavior analysis. CM refers to the application of the three-term contingency (or operant conditioning), which uses stimulus control and positive reinforcement to change behavior.

Research has demonstrated the effectiveness of treatment approaches using contingency management (CM) principles, which involve giving patients tangible rewards to reinforce positive behaviors such as abstinence.
Studies conducted in both methadone programs and psychosocial counseling treatment programs demonstrate that incentive-based interventions are highly effective in increasing treatment retention and promoting abstinence from drugs.

Voucher-Based Reinforcement (VBR)

This augments other community-based treatments for adults who primarily abuse opioids (especially heroin) or stimulants (especially cocaine) or both. In VBR, the patient receives a voucher for every drug-free urine sample provided. The voucher has a monetary value that can be exchanged for food items, movie passes, or other goods or services that are consistent with a drug-free lifestyle. The voucher values are low at first, but increase as the number of consecutive drug-free urine samples increases; positive urine samples reset the value of the vouchers to the initial low value. VBR has been shown to be effective in promoting abstinence from opioids and cocaine in patients undergoing methadone detoxification.

Prize Incentives CM

This applies similar principles to VBR but uses chances to win cash prizes instead of vouchers. Over the course of the program (at least 3 months, one or more times weekly), participants supplying drug-negative urine or breath tests draw from a bowl for the chance to win a prize worth between $1 and $100. Participants may also receive draws for attending counseling sessions and completing weekly goal-related activities. The number of draws starts at one and increases with consecutive negative drug tests and/or counseling sessions attended but reset to one with any drug-positive sample or unexcused absence. The practitioner community has raised concerns that this intervention could promote gambling—as it contains an element of chance—and that pathological gambling and substance use disorders can be comorbid. However, studies examining this concern found that Prize Incentives CM did not promote gambling behavior. Research has demonstrated the effectiveness of treatment approaches using contingency management (CM) principles, which involve giving patients tangible rewards to reinforce positive behaviors such as abstinence. Studies conducted in both methadone programs and psychosocial counseling treatment programs demonstrate that incentive-based interventions are highly effective in increasing treatment retention and promoting abstinence from drugs.

New research suggests that offering methamphetamine abusers an incentive-based behavioral therapy program called contingency management (CM — also known as Motivational Incentives), along with psychosocial therapy is more effective than psychosocial therapy alone. The study was supported by the National Institute on Drug Abuse (NIDA), National Institutes of Health, and is published in the November 2006 issue of the American Journal of Psychiatry.

A CM program applies rules and consequences to help people change their behavior. In other words, participants are in treatment with contingencies, or rewards. In this case, the rules required production of drug-free urine samples. The rewards were plastic chips that could be exchanged for prizes. Other examples of CM awards might be raffle tickets, or small prizes that could be exchanged for a larger prize. The more the patient follows the rules, the more chips they earn. If the rules are not followed, they can lose chips.

Previous studies have shown the effectiveness of CM as a treatment for stimulant abuse (primarily cocaine). This most recent study suggests that CM can help methamphetamine abusers to stop or reduce their abuse of the drug for a longer time than individuals who receive the standard treatment as usual but do not receive such incentives, or rewards.

“Methamphetamine abuse is associated with numerous medical consequences, such as rapid, irregular heartbeat, stroke, severe dental problems, psychosis, and addiction, and constitutes one of the nation’s most serious public health problems,” says Dr. Elias A. Zerhouni, director of the National Institutes of Health. “The results of this study are an important step toward developing more effective therapies to combat it.”
“This study represents the first controlled trial of CM in the treatment of methamphetamine abuse,” says NIDA Director Dr. Nora D. Volkow. “This gives treatment providers another tool to help methamphetamine addicts.”

Lead scientist Dr. John Roll, of Washington State University, and his colleagues observed that participants who received CM plus treatment as usual submitted significantly more substance-free urine samples than participants who received only usual treatment during the 12-week study. “Similarly, participants who were part of the CM program were continuously abstinent for almost five weeks, while those who received the usual treatment documented continuous abstinence for less than three weeks,” he says.

This study was conducted through NIDA’s National Drug Abuse Clinical Trials Network, a research-based infrastructure that tests the effectiveness of new and improved interventions in community-based treatment settings among diverse populations. All participants underwent psychosocial therapy and were randomized to receive either additional CM treatment or no additional treatment.

At the clinic with the largest proportion of participants, usual care consisted of the Matrix Model of psychosocial treatment, a comprehensive treatment approach including individual counseling, cognitive behavioral therapy, family education, self-help programs, and monitoring for drug use by urine testing. At the other clinics, treatment was a mix of cognitive behavioral therapy and relapse prevention. Cognitive behavioral therapy seeks to identify distorted thinking that influences mood and behavior and to replace it with more rational, adaptive thoughts and actions. Relapse prevention is a strategy that trains drug abusers to overcome the stressors or triggers in their environments that may cause relapse into drug abuse and addiction.

“The Matrix Model of psychosocial treatment currently is thought to be the most effective therapy for methamphetamine addiction,” says Dr. Volkow. “And CM has shown itself to increase the therapeutic effectiveness of treatments for other drug abuse disorders. Combining these two treatments gives us an even more powerful weapon against methamphetamine abuse.”

*The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world’s research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to ensure the rapid dissemination of research information and its implementation in policy and practice. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found on the NIDA home page at [www.drugabuse.gov](http://www.drugabuse.gov).*

**What is your opinion on using motivational incentives in recovery of Mental health issues?**

A: With certain populations of patients could see using the general techniques and adapting them to meet the needs of the patient. The psychotic, delusional, manic, extremely impulsive and/or a patient that decompensates when overstimulated as examples of patients that might be harmed by some of these techniques. Contingency management is a type of therapy defined by the systematic reinforcement of positive behaviors and, to a lesser extent, the punishment of negative ones. It is most often used in mental health treatment, substance abuse treatment, and in children with behavioral problems. Studies have shown significant success rates with this type of mental health intervention.

One area in which contingency management has widespread potential benefits is individual retention in treatment. Psychiatric treatments suffer from high rates of attrition, which in turn relates to increased morbidity and mortality. Contingency management is also used as conduct disorder treatment in children. This mode of educational intervention is commonly known as a **token system**. Under a token system, a child is given a token for good behavior. The tokens can be amassed and traded in at a later time for perks, treats, and special privileges. If the
child misbehaves, a token is confiscated. There has, however, been a fair amount of criticism aimed at this mode of contingency management when it is applied to especially young children.

This paper (Petry NM. Contingency management: what it is and why psychiatrists should want to use it. Psychiatr. 2011;35(5):161-163. doi:10.1192/pb.bp.110.031831) describes contingency management and evidence of its efficacy for reducing drug use. It then details areas in which contingency management interventions can be applied in the context of psychiatric treatments more generally, including increasing abstinence in individuals with dual diagnoses, encouraging attendance in mental health treatment settings, enhancing adherence to psychiatric medications, reducing weight, and improving exercise. Greater awareness and use of contingency management in practice may improve outcomes across a range of mental health and related conditions.

Two additional applications of contingency management are relevant to psychiatry. The intervention appears to be useful in assisting individuals to lose weight. (Volpp KG, John LK, Troxel AB, Norton L, Fassbender J, Loewenstein G. Financial incentive-based approaches for weight loss: a randomized trial. JAMA 2008; 300:2631 -7) Given high comorbidity between overweight/obesity and psychiatric disorders, contingency management for weight loss may be advantageous in psychiatric patients with obesity.

Contingency management appears effective in increasing adherence to exercise regimens. (Weinstock J, Barry D, Petry NM. Exercise-related activities are associated with positive outcome in contingency management treatment for substance use disorders. Addict Behav 2008. ; 33:1072 -5.) Given the inverse association between regular exercise and depressive symptoms, reinforcing individuals for objective evidence of initiating and maintaining exercise routines may have positive benefits with respect to mental health as well as physical health outcomes.

How can someone go about getting funds for the motivational incentive programs?


Clinics in Spain, Canada and the USA have reported that some or most of the reinforcers for contingency management can be obtained via community donations. (Garcia-Rodriguez O, Secades-Villa R, Higgins ST, Fernandez-Hermida JR, Carballo JL. Financing a voucher program for cocaine abusers through community donations in Spain. J Appl Behav Anal 2008. ; 41:623 -8). These approaches may be particularly advantageous with respect to raising funds for highly vulnerable populations, such as pregnant women, adolescents, people with HIV, homeless individuals, and those with severe and persistent mental health disorders.

Do you have access to a grant writer? It is critical this person really knows how to put the grant proposal together. Do not know much about grant writing so ask around for help. A nice site is https://grants.nih.gov/grants/funding/funding_program.htm. Please check it out as it will let you know about National Institute of Health (NIH) and related grants

Where can we access the appendix articles?

A: Hoping you are speaking to me about the references. There are 40-50 of them at the back end of the handout. Up until last year I paid thousands of dollars every year to have access to certain research libraries. The articles were free to download or use as you wish.

Today, work like everyone else. Put the authors name, title of publication, publisher and year published. If you have limited information or even a quote put it in the search bar. I often use the authors name and year published. What ever you have available.
Some of the sites want you to pay. Check to see if you can find it elsewhere. By going to an author’s resume, she had a list of articles and links to open them up for free. Also, even the pay sites give you an abstract. This should help you determine the value of the material to your particular project. You can often write the author and get permission to use as reference and also have them send a copy of the finished article.

**What is thought to be the most difficult part of finding a pharmacological treatment for Methamphetamine dependence? Funding, Research?**

A: Certainly funding and well-designed and accurate research. I think one of the difficulties has been large pharmaceutical companies, at times, backing away from funding for mental health and addiction pharmaceutical research. “Off-label” utilization of medication-FDA approved for another disease or disorder and with similar properties to other drugs on the market.

indicates how respondents rated the uncertainty or risk involved in R&D issues in the field of drug addiction as compared with the fields of cancer, AIDS, and cardiovascular disease. Clearly, these results are not a quantitative assessment of the industry, but the drug-addiction field is perceived to be high risk in all areas except for likelihood of competitive advantage over other treatments and likelihood of fast track FDA review (https://www.ncbi.nlm.nih.gov/books/NBK232167/).

However, NIH, NIDA and others are initiating and supporting research for mental health and addiction populations.

The following addresses a number of medications at various stages of development and also the “off-label” approach (https://www.drugabuse.gov/publications/research-reports/methamphetamine/what-treatments-are-under-development-methamphetamine-use-addiction)

There are currently no medications that counteract the specific effects of methamphetamine or that prolong abstinence from and reduce the use of methamphetamine by an individual addicted to the drug. NIDA has made research on the development of medications to treat addiction to stimulants and other drugs a priority, and NIDA-funded researchers are investigating a number of pharmacological approaches for treating methamphetamine use disorder.

The pharmaceutical industry is what economists call a high-fixed low-cost marginal cost industry. This means that the cost of bringing a new drug to market is very high and the process is risky, while the cost of producing an extra unit of a product that is on the market is frequently “pennies a pill”. There is energetic disagreement about the exact cost of bringing a new drug to market, but there is widespread recognition that the costs run into at least many hundreds of millions of dollars per new drug product.

When developing drug treatments, researchers typically examine the impact of potential medications that have neurobiological effects that may counter the known physiological consequences of chronic methamphetamine use. They may also test medications that have shown promise in treating other addictions or other psychiatric disorders. The following targets and strategies have shown promise in animal or human studies related to methamphetamine use disorder.\(^{15,16}\)

The neuroimmune system: Chronic methamphetamine use is associated with activation of microglia, cells that mediate inflammation in the central nervous system. Drugs like ibudilast and minocycline are being studied for their capacity to inhibit activation of microglia.

Cognitive enhancement: Chronic methamphetamine use is also associated with cognitive problems, such as impaired decision-making and impaired behavioral inhibition. Several drugs are under investigation for their potential to improve cognition in people who use methamphetamine.
Dopamine agonist treatment: Medications based on activation of the same receptors targeted by an addictive drug are effective in treating other addictions, such as the use of methadone or buprenorphine to treat opioid use disorder and the use of nicotine replacement to assist smoking cessation. Since methamphetamine targets the dopamine system, some stimulant medications that activate dopamine receptors (agonists) and that are often used to treat attention-deficit hyperactivity disorder (ADHD) are being investigated as potential medications to treat methamphetamine use disorder.

Other monoamine (serotonin, norepinephrine, dopamine) targets: Methamphetamine withdrawal symptoms are similar to depression, leading researchers to investigate the utility of antidepressants that act on the serotonin and norepinephrine systems for methamphetamine use disorder. Antipsychotic medications also act on the dopamine system and may have promise for ameliorating the effects of chronic methamphetamine use.

The opioid system: The euphoric effects of addictive drugs likely involve the opioid system. Candidate medications in this category include the opioid antagonist naltrexone (currently being studied in combination with the antidepressant bupropion) and the opioid partial agonist buprenorphine.

GABA and glutamate systems: Several medications targeting disruptions in the balance of excitation and inhibition (mediated by the neurotransmitters GABA and glutamate) are being investigated to treat methamphetamine use disorder.

Hormones: The hormones cholecystokinin-8 and oxytocin have both shown promise in reducing the rewarding properties of methamphetamine in animals.


A human clinical trial is currently underway to test an immunologic agent called a monoclonal antibody, which binds to methamphetamine and neutralizes it before it can exert its effects.

I’d like to know if these physical impacts, twitches, etc., can become permanent?

A: From what I gather if there is a previous history of “tics” there may be a longer-term reoccurrence while with no history they cease during early recovery.

Tics. There are two types of tics -- motor tics and vocal tics. These short-lasting sudden movements (motor tics) or uttered sounds (vocal tics) occur suddenly during what is otherwise normal behavior. Tics are often repetitive, with numerous successive occurrences of the same action. For instance, someone with a tic might blink his eyes multiple times or twitch her nose repeatedly.
Motor tics can be classified as either simple or complex. Simple motor tics may include movements such as eye-blinking, nose-twitching, head-jerking, or shoulder-shrugging. Complex motor tics consist of a series of movements performed in the same order. For instance a person might reach out and touch something repeatedly or kick out with one leg and then the other.

**Twitches.** Unlike tics, the majority of muscle twitches are isolated occurrences, not repeated actions. Muscle twitches are also known as myoclonic jerks. They are entirely involuntary and cannot be controlled or suppressed.

One type of muscle twitch is benign essential blepharospasm. Blepharospasm refers to the muscles of one or both eyelids twitching uncontrollably. This often occurs repeatedly over a sustained period of time. In extreme cases, which are rare, benign essential. Another type is the eyelid twitch that cannot be controlled (as opposed to the tic which can be consciously controlled for a short length of time. It also occurs most often in adults

Generally the *twitches* from meth go away over time in recovery. Some people who use meth may experience eye twitching and muscle spasms around the eyes. Eyes will twitch uncontrollably several times per minute throughout the day. Many times, eye twitching resolves on its own after a person has entered recovery.

The proposed mechanism leading to abnormal movements after cocaine exposure is locomotor sensitization, the augmented motor-stimulant response that occurs with repeated, intermittent exposure to cocaine. Locomotor sensitization has been hypothesized to result from a decrease in inhibitory modulation of excitatory transmission from the medial prefrontal cortex to the ventral tegmental area and nucleus accumbens [Steketee JD. Cortical mechanisms of cocaine sensitization. Crit Rev Neurobiol. 2005;17(2):69–86]. Recent animal data suggests that cocaine-induced activation of cAMP-element binding protein and generation of new silent synapses may serve as key cellular events mediating cocaine-induced locomotor sensitization.

Check the web for videos of meth blinks, twitches, etc.