METHAMPHETAMINE ADDICTION TREATMENT

Michael Weaver, MD, DFASAM
Professor & Medical Director
University of Texas Health Science Center at Houston
LEARNING OBJECTIVES

- Discuss problems resulting from use of methamphetamine.
- Discuss different behavioral and medication treatments for stimulant use disorder.
METHAMPHETAMINE

- Potent, long-acting stimulant
- Synthesized in clandestine labs directly for illicit use
  - Western U.S.
  - Mexico
- 14.5 million adults in U.S. have used methamphetamine
  - 5.4% of population
- Nearly 1 million current users in U.S.
MECHANISMS OF ACTION

- Bind to dopamine transporter (reuptake pump) on presynaptic neuron and reverses pump
- Increase release of excitatory neurotransmitters from intracellular vesicles
- Inhibit monoamine oxidase in synaptic cleft

High concentration of dopamine (D), norepinephrine (NE) and serotonin (5HT)
ADMINISTRATION & PATTERNS OF USE

- Users may start with oral route
  - Low risk, but less ‘rush’ (euphoria)
- Intranasal insufflation (snorting, sniffing)
  - Most dangerous
- Smoking
- Injection (especially intravenous)
- Users average 1-7 binges per week
  - Each lasts 4-24 hours
  - May re-administer every 10-30 minutes
  - ‘run,’ ‘spree’
UNDESIRABLE ACUTE EFFECTS

- tachycardia, hypertension, arrhythmia
- insomnia, panic attacks, psychosis
- hyperpyrexia
- seizures
- malignant hypertension
  - Cerebrovascular accident
  - Myocardial infarction
TREATMENT OF INTOXICATION

- Verbal reassurance
- Quiet environment
  - Limit stimulation
- Sedate for severe agitation, anxiety
- Antipsychotic medication if necessary
- Cardiac monitoring
  - Heart rhythm problems
  - High blood pressure
PSYCHIATRIC MANIFESTATIONS

- Psychiatric consultation
- May require inpatient treatment of psychosis
  - Often resolves as methamphetamine intoxication effects subside
- Psychiatric symptoms that persist >1 week
  - May be co-occurring primary psychiatric disorder
  - Early unmasking due to methamphetamine use
STOPPING METHAMPHETAMINE

- Stimulant withdrawal syndrome
  - Irritability
  - Depression
  - Hypersomnolence
  - Hyperphagia (“the munchies”)
- No significant physical withdrawal symptoms
- Can stop prescribed stimulants without tapering
- Care is supportive
  - No pharmacotherapy
PHASES OF WITHDRAWAL

- Phase I – Crash
  - Craving, depression, anxiety
  - Like hangover after alcohol binge

- Phase II
  - Anhedonia, malaise, impaired concentration
  - Like other drug withdrawal syndromes

- Phase III – Extinction
  - Intermittent conditioned craving
  - Lasts months to years
WHY IS IT SO HARD TO QUIT?

- Stimulants (methamphetamine and others) are powerful reinforcers
  - Most potent reinforcing agents known
  - Pairs stimuli around user with euphoria of use

- Craving
  - Caused by vivid memories of numerous periods of extreme euphoria during a binge
  - Set off by environmental cues (triggers)

- Neurochemical changes create psychological dependence that leads to recurrent use
  - Users feel drug is essential to normal functioning
PHARMACOLOGIC TREATMENTS FOR METHAMPHETAMINE USE DISORDER

- Desipramine
- Imipramine
- Monoamine oxidase inhibitors
- Fluoxetine
- Trazodone
- Haloperidol
- Flupenthixol
- Lithium
- Methylphenidate
- Levodopa
- Bromocriptine
- Amantidine
- Carbamazepine
- Valproate
- Topiramate
- Mazindol
- Naloxone
- Buprenorphine
- Methadone

Many tried, none effective
POSSIBLE NEW MEDICATION COMBINATION?

- Accelerated Development of Additive Pharmacotherapy Treatment (ADAPT) for Methamphetamine Use Disorder
- Sponsored by National Institute on Drug Abuse Clinical Trials Network (NIDA CTN)

- High-dose bupropion
- Depression medication
- High-frequency naltrexone injections
- Opioids, alcohol
- 400 subjects with daily methamphetamine use
- Multiple sites throughout U.S.
- Published positive findings
- Replication trials currently underway
BEHAVIORAL TREATMENT

- Mutual-help groups
  - 12-Step (Narcotics Anonymous)
  - SMART Recovery
- Counseling
  - Individual
  - Facilitated groups
- Contingency Management
- Family therapy
- Intensive outpatient
- Residential
CONTINGENCY MANAGEMENT

- Behavioral therapy that has shown success for stimulant addiction and others
- “Paying addicts to stay clean”
- Reduce drug use by systematically increasing availability & frequency of alternative reinforcing activities

- Contingencies are contrived
  - Put in place explicitly & exclusively for therapeutic purposes
  - Earn something of value contingent upon a specific result
    - Urine sample negative for illicit drug(s)
    - Attending therapy sessions
    - Completing homework assignments
CONTINGENCY MANAGEMENT THEORY

- Contrived sources of alternate reinforcement delivered through CM are designed to promote initial abstinence
- Allow time for patient & therapist to work toward reestablishing more naturalistic alternatives to drug use
  - Employment
  - Stable family life
  - Social connections that reinforce abstinence
- Naturalistic alternatives sustain long-term abstinence after contrived reinforcers are discontinued
EXAMPLE OF CONTINGENCY MANAGEMENT

- Voucher-based system to give positive rewards for staying in treatment and giving urine samples that are negative for drugs
- Exchange vouchers for items that encourage healthy living
- Drug-free lifestyle goals eventually replace need for vouchers as rewards
- Expensive, but less than costs to society of methamphetamine use
Paying Addicts (Less) to Stay Clean

- Contingency Management strategies effective for treating addiction
- Expensive
- Prize-based CM less expensive
- Earn chance to draw chip for a prize (0-$100) for each urine sample without illicit drugs
- Number of draws increases as number of weeks of abstinence increases

BARRIERS TO CONTINGENCY MANAGEMENT

- Adoption rates for CM are low in community OUD clinics
- Competing staff priorities
- Insufficient training
- Philosophical objections
- Staff turnover
- Insufficient funding
MINDFULNESS

- Derived from philosophies concerning cultivation of awareness
- Practices designed to evoke a state of mindfulness
- Focused attention
  - Concentrate on breathing
- Acknowledge and disengage from distracting thoughts and emotions
- State of metacognitive awareness
- Moment-by-moment monitoring
  - Cognition
  - Emotion
  - Sensation
  - Perception
- Attentive and nonjudgmental
- No perseveration on thoughts of past and future
MINDFULNESS AND ADDICTION

- Mindlessness
  - Characteristic of addiction
  - Habitual responses
  - Automatic behavior
  - No regard for consequences

- Mindfulness
  - Remain nonreactive
  - Accept distressing thoughts and emotions

- Mindfulness enhances capacity for cognitive control
- Reduces substance use and craving
- Mindfulness originally focused on reducing emotional distress
  - Stress
  - Chronic pain
  - Depression
- Mindfulness meditation leads to changes in brain structure
MINDFULNESS-BASED INTERVENTIONS

- Practices
  - Mindful breathing
  - Body scan meditation
  - Debrief as group
- Chocolate exercise
  - Compare with craving for drugs
- Mindfulness de-automatizes addictive behavior
  - Deconstruct craving
  - Adaptively respond to urge rather than automatically react to cues to use
- Group therapy format
- Weekly sessions for around 8 weeks
  - Psychoeducational material
  - Homework exercises
- Guided by trained clinician
  - Requires intensive instructor training
SMARTPHONE APPS

- Recovery-based applications (apps) for smartphones combine evidence-based research and technology
- 24/7 access to support and connection
- Doesn’t require interpersonal interaction

Features
- Track sobriety
- Monitor triggers
- Connect with peers in recovery
- Access information
- Keep a journal
SUMMARY

- Stimulants ‘rev up’ the body and mind
- Different types of addiction treatment are available, which are successful and cost-effective
- Contingency management uses motivational incentives (gift cards, vouchers, prize chips) to reinforce specific patient treatment-related behaviors such as keeping appointments or negative drug screens
- Mindfulness helps resist cravings and disrupt automatic behaviors of using drugs
- Smartphone apps help reinforce treatment compliance
REFERENCES


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QUESTIONS?