



Stimulants: A Focus on Effective Treatment Interventions and Recovery Supports



ATTC

Addiction Technology Transfer Center Network
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Disclosures



No relevant financial relationships with commercial interests exist for anyone who is in control of the content of this activity.

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- ATTC Stimulant Workgroup
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- James Peck, UCLA ISAP

Learning Objectives



At the end of this webinar, participants will be able to:

1. Discuss at least two research findings related to brain recovery following use of stimulants.
2. Recall at least two evidence-based behavioral interventions found to be effective in treating people with a stimulant use disorder.
3. Specify at least three recovery supports for people who use stimulants.

A Quick Refresher: The Impact of Stimulants on the Brain



Meth 2.0



Extremely pure (~97%)

High potency → high addictive potential

Increased
cardiotoxicity,
psychiatric
effects

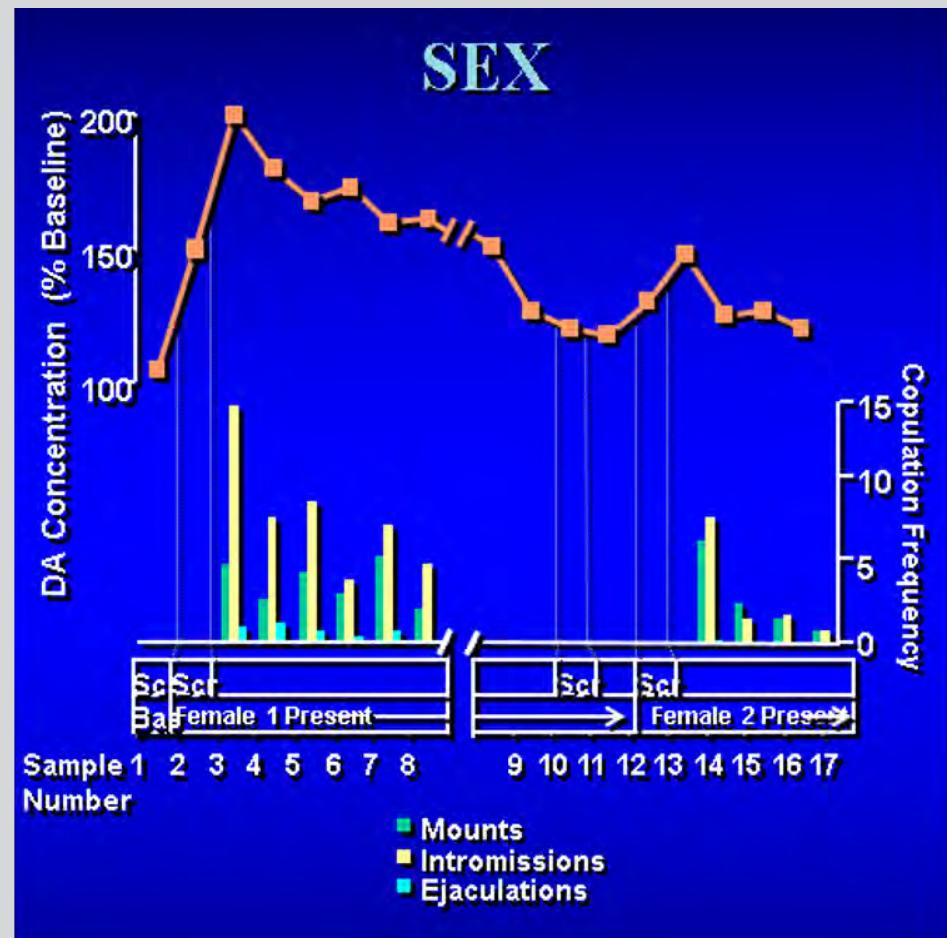
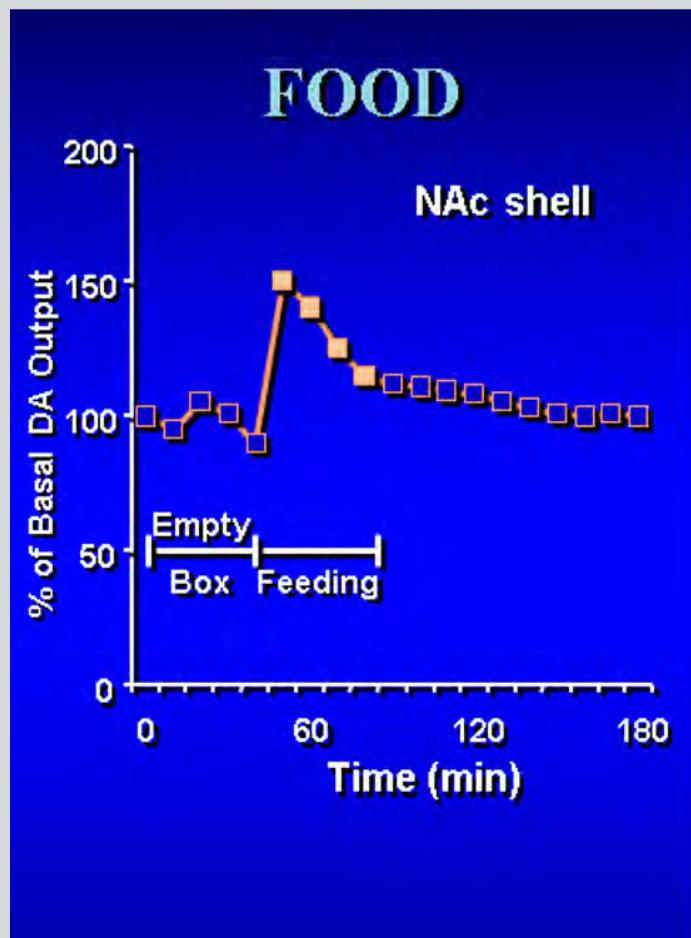
Mass produced in Mexico → inexpensive

Readily available, easily accessible

Let's First Take a Look at Normal Dopamine Functioning

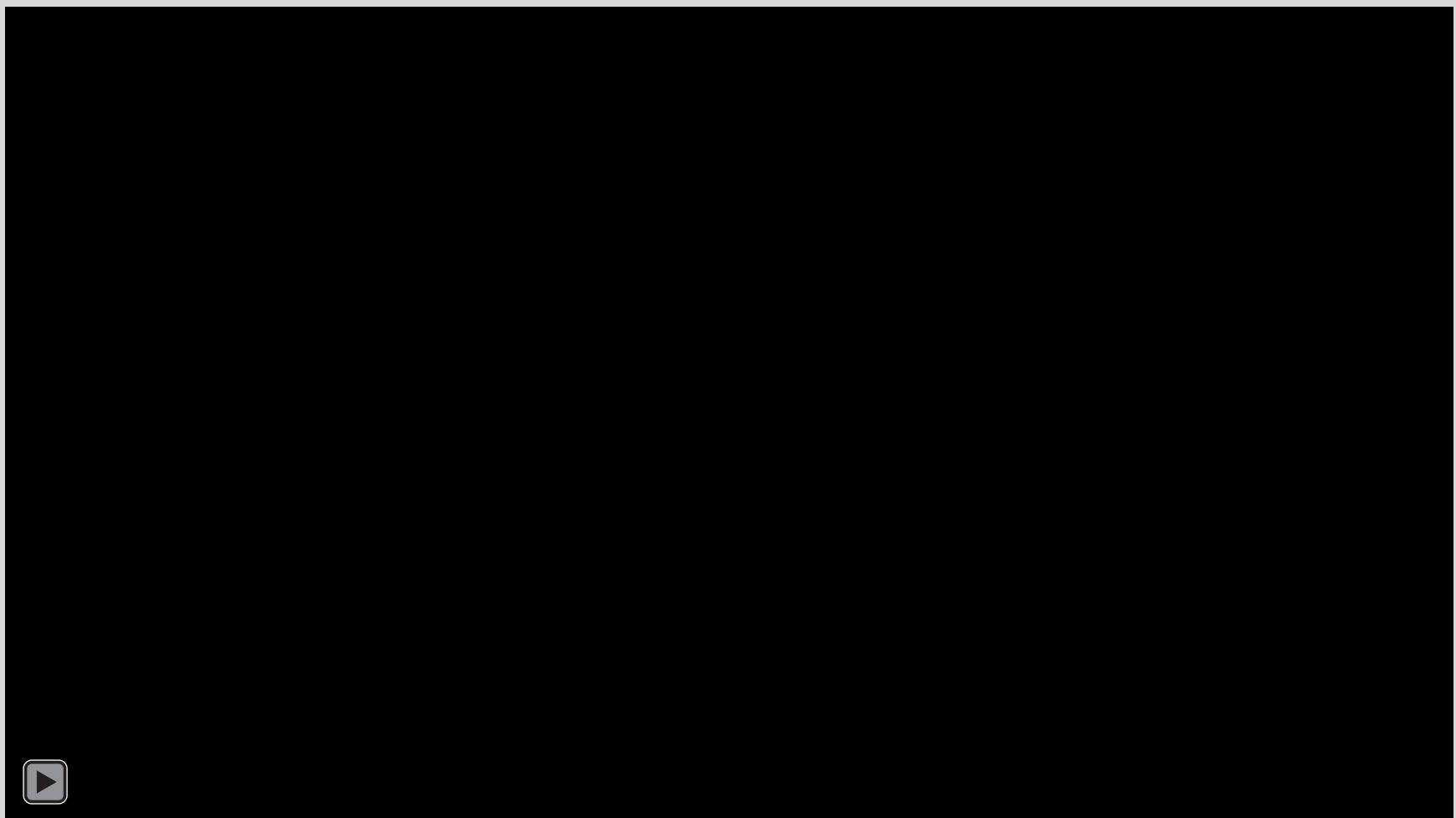


Natural Rewards Elevate Dopamine Levels



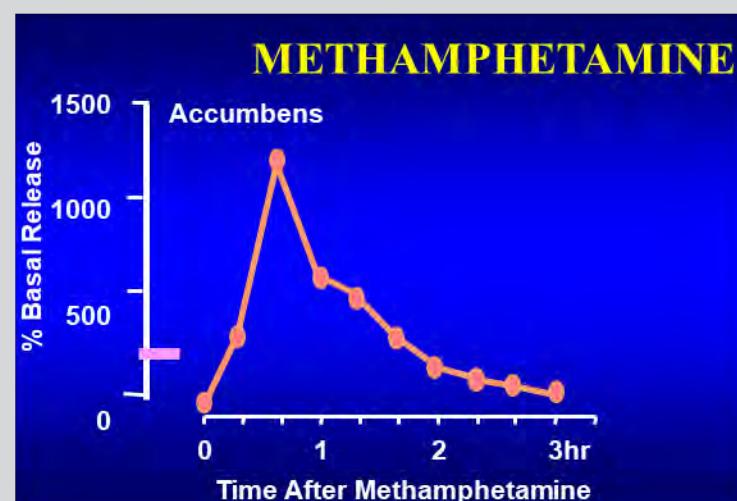
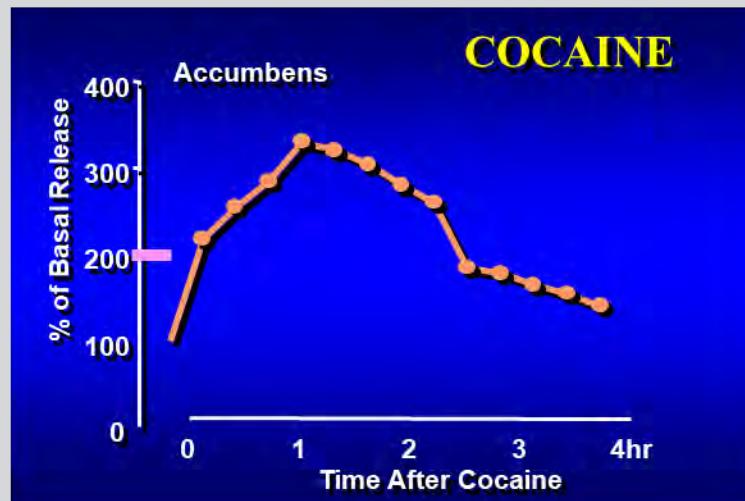
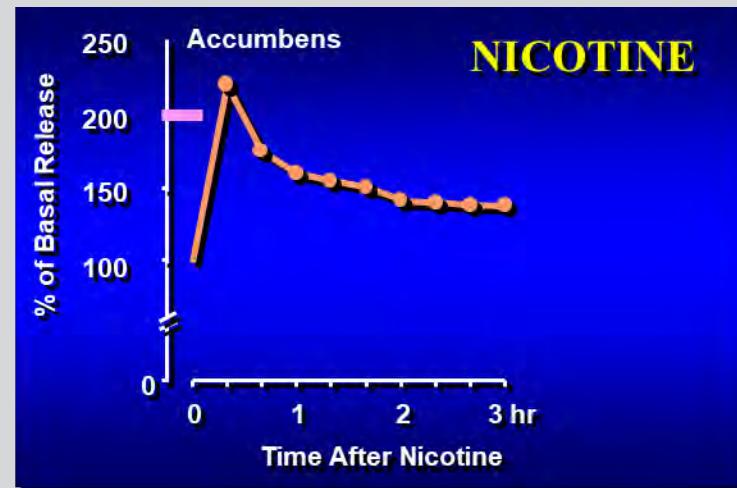
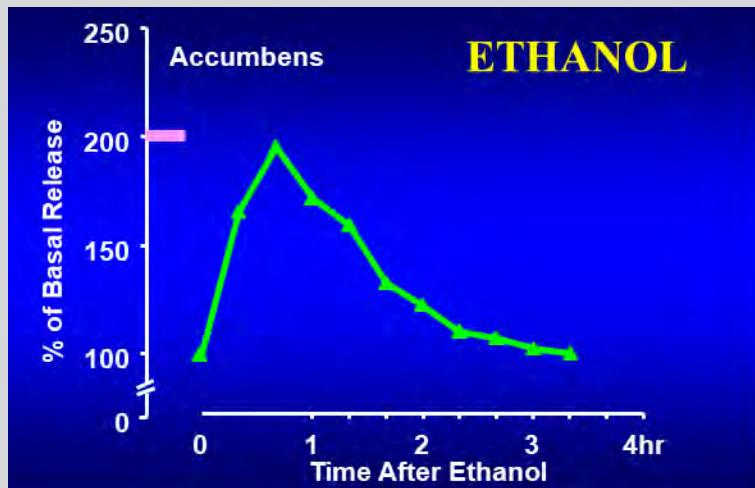
SOURCES: Bassareo & DiChiara, 1999;
Fiorino & Phillips, 1997

How the Brain Responds to Methamphetamine



SOURCE: Meyers, 2008

Effects of Drugs on Dopamine Release



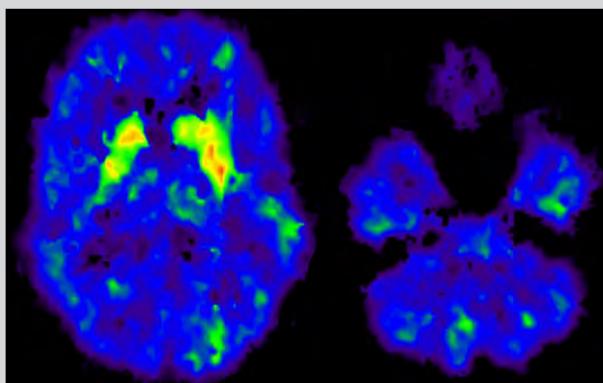
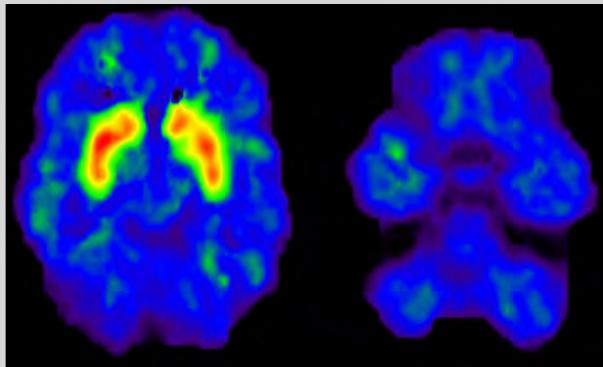
SOURCES: Shoblock et al., 2003;
DiChiara & Imperato, 1988



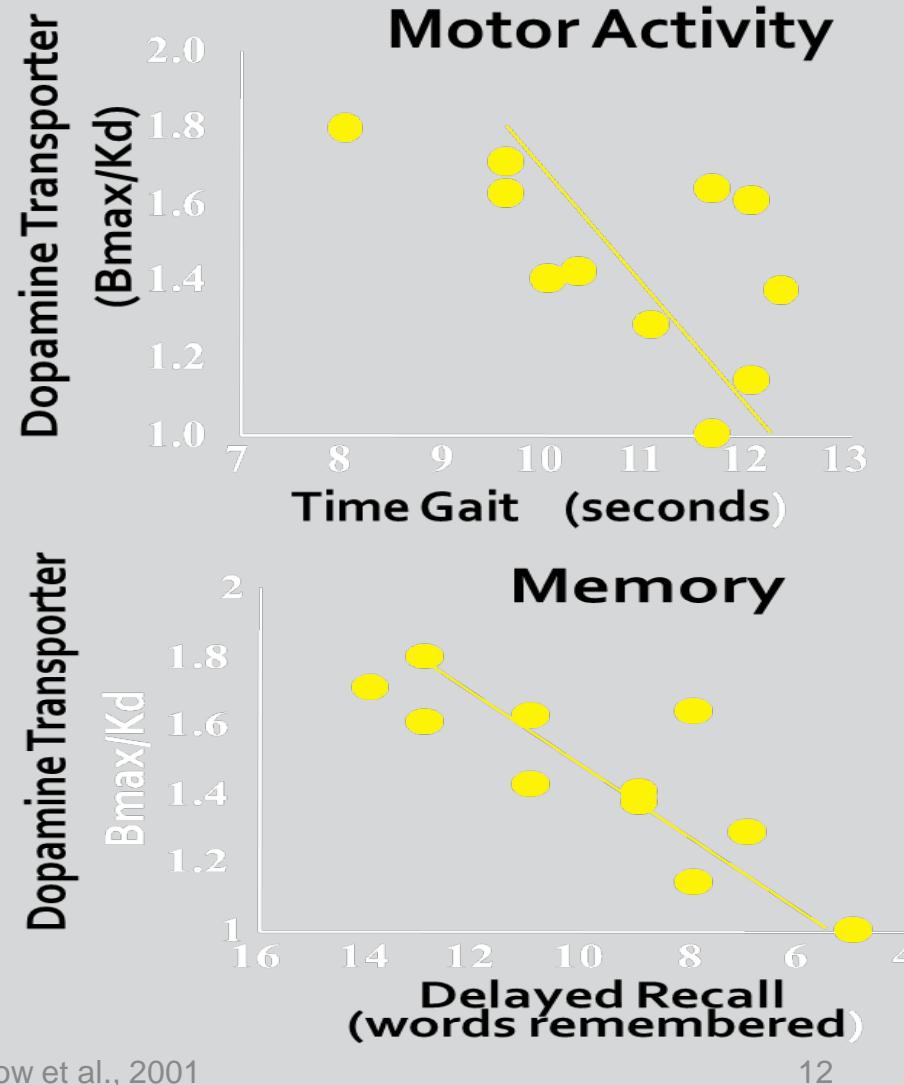
Cognitive and Memory Effects of Stimulant Use



Dopamine Transporters in People who Use Methamphetamine



$p < 0.0002$



SOURCE: Volkow et al., 2001

Cognitive Deficits in Methamphetamine Use Disorder

- Compared 108 methamphetamine treatment seekers and 50 matched controls.
- Methamphetamine use was associated with **impulsive decision making** and **disinhibition**.
- Greater disinhibition associated with **longer durations of methamphetamine use**.



Co-Occurring Disorders: Common and Complex



Primary Psychiatric Disorder



**Methamphetamine Use Disorder
Methamphetamine Induced
Psychiatric Disorder**



Psychiatric and Substance Use Disorder (SUD) Comorbidity

- Individuals with lifetime mood or anxiety disorder
 - Approximately 20% with SUD
- Individuals with lifetime SUD
 - 41% with mood disorder
 - 30% with anxiety disorder
- Comorbidity rates higher in women with SUDs despite lower rates of SUDs than men



Comorbidity Continued...



- **56%** of patients with bipolar disorder (BP), and **46%** of patients with schizophrenia have SUD compared to **15%** of the general population.
 - Higher for Bipolar I than Bipolar II
 - Mixed episodes, rapid cycling subtypes more common
- **60+%** of psychiatric inpatients have a current or previous SUD.
- Estimated that up to **50%** of patients with SUD may have a treatable psychiatric disorder.

Challenges for Patients who are Dually Diagnosed



- Patients with both mental illness and SUD are more likely to have
 - Greater illness severity
 - Poorer treatment (tx) adherence than those with mental illness alone.¹
- Due to complexities in patient populations, there is little consensus in the scientific literature on the best treatments.
 - Co-occurring disorders often excluded from medication trials
- Ex: antidepressants have been associated with mixed substance use outcomes in those with depression in clinical trials.^{2,3}

SOURCES: SAMHSA, 2007; Agabio, Trogu, & Pani, 2018; Torres et al., 2005

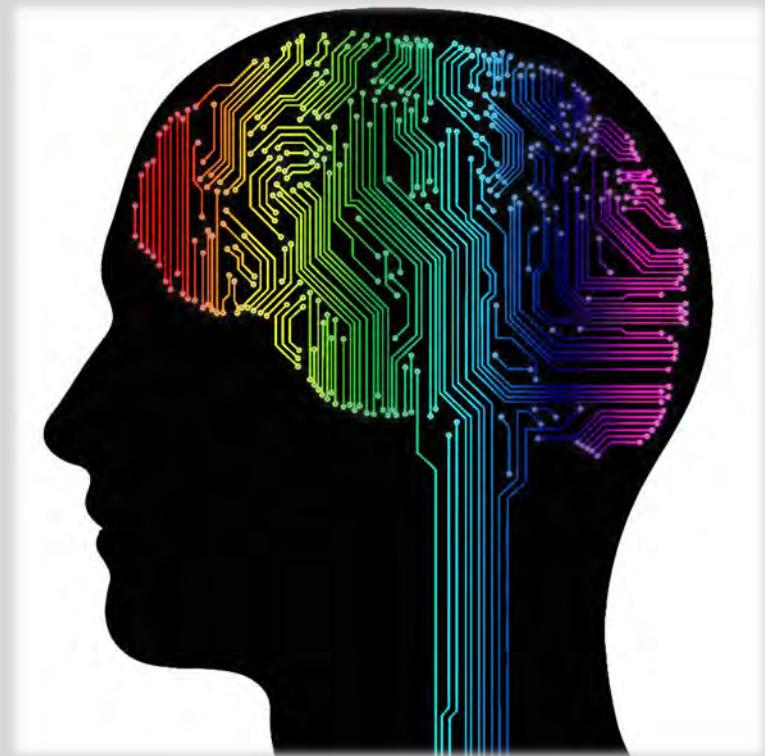
Clinical Challenges with Individuals Who Use Cocaine and Methamphetamine



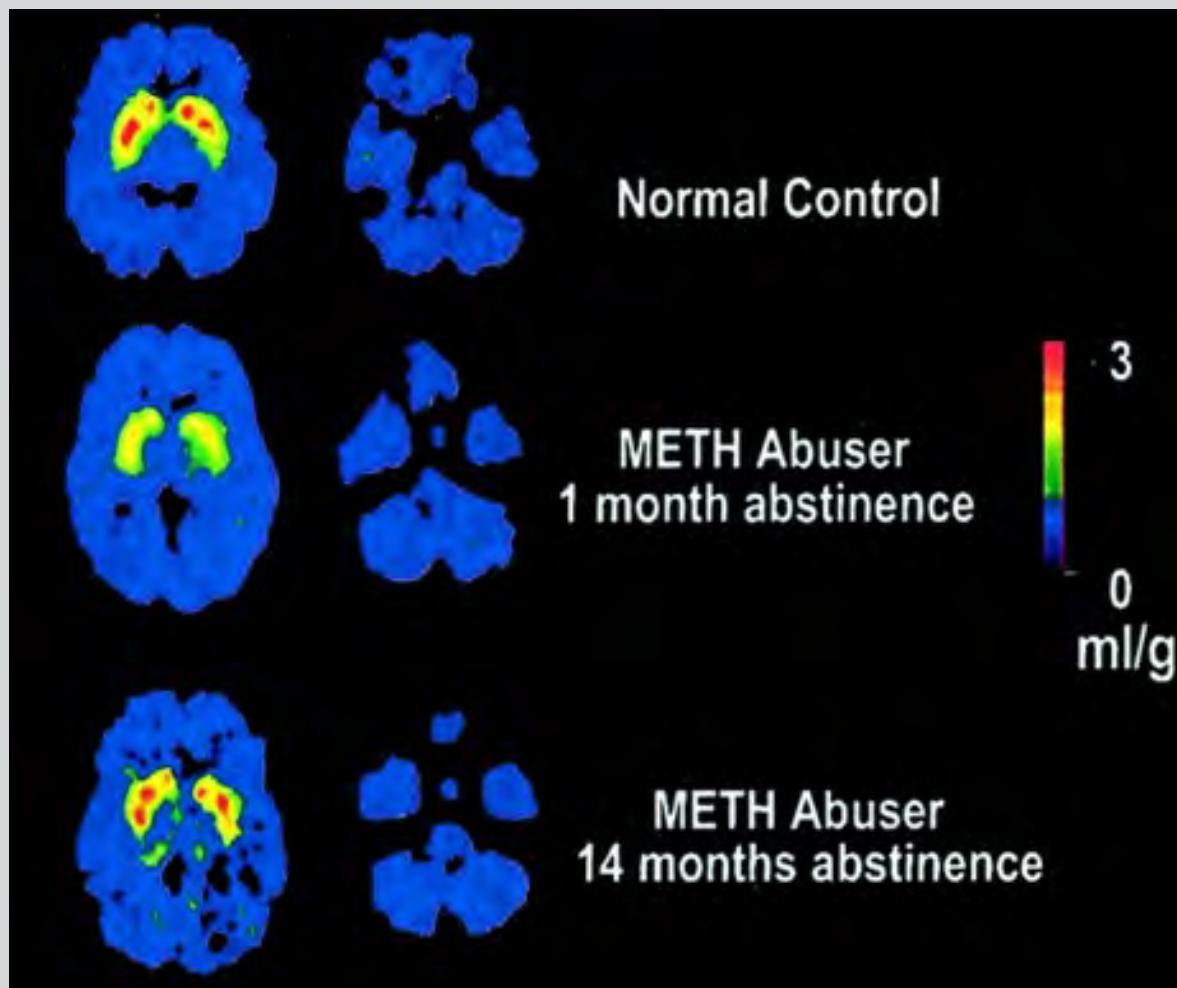
- Overdose death
- Limited understanding of stimulant use disorder
- Ambivalence about need to stop use
- Impulsivity/Poor judgement
- Cognitive impairment and poor memory
- Anhedonia
- Hypersexuality/Hyposexuality
- Psychosis/Paranoia
- Powerful Pavlovian trigger-craving response
- Very poor retention in outpatient treatment
- Elevated rates of psychiatric co-morbidity



Healing is
Possible



Recovery of Dopamine Transporters with Abstinence



SOURCE: Volkow et al., 2001

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What to Expect after Cessation of Methamphetamine Use



- Fewer nightmares
- Improvement in depression and anxiety symptoms
- Improvement in focus and attention
- Normalization of brain receptors and transporters
- Reduction in jitteriness and hyper-emotional response
- Stabilization of mood

Behavioral Treatment Interventions for People who Use Stimulants



Harm Reduction Strategies for Individuals Who Use Stimulants



- Information about medical and psychiatric effects of stimulants
- Access to syringe exchange
- Naloxone (for opioid overdose)
- Quiet rooms and wash-up/shower rooms
- Condoms/safe sex education
- Topical antibiotic creams and ointments for injection sites
- Water (for dehydration)
- Toothpaste/toothbrush

Are there Medications for the Treatment of Stimulant Use Disorder?



- The short answer is **NO**
- A few medicines have had positive results in clinical trials
- To date, these medicines have not demonstrated reproducible results
- Much more research is needed to determine the overall efficacy of these medicines

Behavioral Treatments



- Contingency Management
- Community Reinforcement Approach
- Cognitive Behavioral Therapy/Relapse Prevention
- Motivational Interviewing
- Matrix Model
- Exercise
- Mindfulness

Psychosocial Interventions for Cocaine and Psychostimulant Amphetamine-Related Disorders



- Twenty-seven randomized controlled studies (3,663 participants) fulfilled inclusion criteria and had data that could be used for at least one of the main comparisons.
- Compared different behavioral interventions for retention in treatment and reducing stimulant use.
- Results showed using some form of **contingency management showed better results** both for reducing dropouts and lowering stimulant use.

Psychosocial Interventions for Individuals with Cocaine and Amphetamine Use Disorder



- Meta-analysis of 50 clinical studies (6,943 participants) on 12 different psychosocial interventions for cocaine and/or amphetamine addiction.
- The **combination of contingency management and community reinforcement approach**, was the most efficacious and most acceptable treatment both in the short and long term.

More (Recent) Evidence for Contingency Management as a Response to Stimulant Use



- A 2020 systemic review of 27 studies found that contingency management has broad benefits in:
 - Greater drug adherence
 - Higher utilization of other treatments and medical services
 - Reductions in risky sexual behavior
- Recommendation: Outpatient programs that offer treatment to people with a methamphetamine use disorder should **prioritize adoption and implementation of contingency management**

Results and Conclusions to Bentzly et al, 2021



Results A total of 157 studies comprising 402 treatment groups and 15 842 participants were included.

Only contingency management programs were significantly associated with an increased likelihood of having a negative test result for the presence of cocaine (OR, 2.13; 95%)

Conclusions In this meta-analysis, contingency management programs were associated with reductions in cocaine use among adults.

Results of CM Treatments



- Reduced methamphetamine use in 26 of 27 studies.
- Longer retention in treatment.
- More therapy sessions attended; higher use of other services and medical services.
- Reductions in risky sexual behavior.
- Increases in positive affect and decreases in negative affect.



A Deep Dive into Contingency Management

What is Contingency Management (CM)?

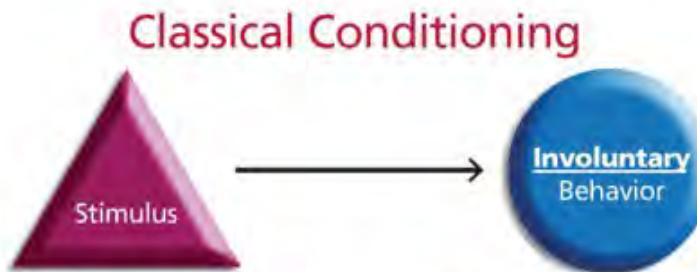


- A technique employing the systematic delivery of positive reinforcement for desired behaviors. In the treatment of methamphetamine dependence, vouchers or prizes can be “earned” for submission of methamphetamine-free urine samples or for attendance at treatment sessions.
- In most CM protocols, the value of the incentive is increased (escalation) as patients perform the target behavior in consecutive UAs or visits. If a positive UA or missed session occurs, the value of the incentive returns to the original value (reset).

DEFINITIONS

Classical Conditioning

- Classical Conditioning refers to the association between a stimulus and an involuntary or automatic behavior (response)



- Patients are often automatically triggered to crave alcohol or drugs by stimuli in their environment

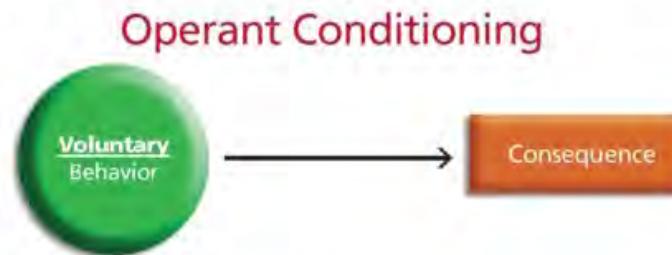


Motivational Incentives are not based on Classical Conditioning but rather on Operant Conditioning principles.

DEFINITIONS

Operant Conditioning

- Operant Conditioning refers to an association between a voluntary behavior and consequence



- The nature of the consequence will impact whether the behavior occurs again

Motivational Incentives are positive reinforcers (consequences) used to increase a desired behavior.

DEFINITIONS

Incentives (Contingencies)

Two types used to shape and change behavior in the early stages of change:

Reinforcement

Used to increase a specific behavior

Punishment

Used to decrease a specific behavior

DEFINITIONS

Reinforcements

Reinforcement is used to **increase** the occurrence of a **desired** behavior

- **Positive reinforcement** involves presentation of a pleasant stimuli after a desired behavior occurs
- **Negative reinforcement** involves the removal of an aversive stimuli after a desired behavior has occurred



**GOAL =
INCREASE
BEHAVIOR**

Challenges to Using CM



- Staff resistance to the idea of incentives
 - Patients should not have to be “paid” or “bribed”; recovery is the reward
 - Motivation needs to come from within, etc.
- Where does the funding for incentives come from?

OIG Position on Incentive Values in CM



- In the Fall of 2019, the OIG made a request for public comment on use of incentives for contingency management.
- Numerous individuals and groups expressed support for modifying (increasing) approved incentive values so CM
- In Dec 2020, OIG published their “Final Rule”

Contingency Management: Policy Implications and Evidence

- Background: On Dec 2, 2020, U.S. DHHS Office of the Inspector General issued Final Rule revisions to federal fraud, abuse, and kickback warnings for patient incentives in Medicare & state healthcare programs
- Perception: HHS OIG limits public-system CM to a maximum of \$75
- Confusing to addiction providers, general health care systems, & payers
- Reality: This interpretation is incorrect
- Risk: CM may be launched at ineffective levels, ultimately damaging the reputation of this vital, effective clinical tool.
- 77684 Federal Register / Vol. 85, No. 232 / Wednesday, December 2, 2020 / Rules and Regulations

OIG Final Rule Language



- “Furthermore, we are aware that some industry stakeholders may be under a misimpression that OIG prohibits contingency management program incentives above \$75. There is no OIG imposed \$75 limitation on contingency management program incentives. Rather, the Federal anti-kickback statute may constrain the ability of individuals or entities to offer contingency management program incentives of any value to Federal health care program beneficiaries, depending on the facts of the arrangement.”

OIG Final Rule, Continued



- “Moreover, in-kind incentives above the \$75 annual, aggregate limit, and all cash or cash equivalent incentives regardless of the amount, must be analyzed on the basis of their specific facts for compliance with the Beneficiary Inducements CMP”
- Federal Register, Vol. 85, No. 232, December 2, 2020, Page 7792

Final Rule: Key Points



What is NOT permissible:

- a. Incentives that result in medically unnecessary or inappropriate items or services reimbursed in whole or in part by a Federal health care program.
- b. Advertising patient incentives to recruit patients or steer patients away from other providers.
- c. Using incentives for the purpose of increasing fees.
- d. Inadequate protection against fraud.

Final Rule: Key Points (2)



What IS permissible:

- a. Incentives that have a direct connection to the coordination and management of care of the target population including for participation in community-based services that are recommended by the patient's licensed health care professional
- b. The use of digital health technology such as remote patient monitoring and telehealth
- c. CM incentives for which the payer only pays when the desired health outcome occurs –attendance, objective, validated measures consistent with treatment (e.g., attendance, abstinent drug tests, and other confirmed behavioral measures).

Final Rule: Key Points (3)



What IS permissible:

- d. Advancing goals, as determined by the patient's licensed health provider, of:
 - (i) Adherence to a treatment regimen;
 - (ii) adherence to a drug regimen;
 - (iii) adherence to a follow-up care plan;
 - (iv) management of a disease or condition;
 - (v) improvement in measurable evidence-based health outcomes for the patient or the target patient population;
 - (vi) ensuring patient safety.”

Final Rule: Key Points (4)



In-kind remuneration and certain limited-use gift cards offered as part of contingency management interventions or other programs to motivate beneficial behavioral changes could receive protection under the patient engagement and support safe harbor if all safe harbor conditions are satisfied

CM: Policy Implications & Evidence



- Importance: \$75 per patient per year is not effective – and it's not CM
- Evidence Base: 50 years & 100 peer-reviewed published papers indicate incentives of \$100 - \$200 per patient per month are most effective
- Cost Benefit: Washington State Institute on Public Policy*: high value CM yields highest societal return on investment (vs. other studied modalities)
- Stimulants: CM is the *only evidence-based approach* effective for the new Stimulant Use Disorder epidemic
- Cost of CM incentives, \$600. Estimated savings to payer: \$3,000

CM per the OIG Final Rule: Policy Review & Requirements

- A detailed analysis of the OIG Final Rule was performed by the *Motivational Incentives Policy Group*, Westley Clark MD JD MPH, Chair
- Key Finding: *The OIG does not limit CM incentives to \$75.*
- The OIG's "safe harbor" of \$75 in annual incentives is one approach
-- BUT NOT the ONLY approach.
- Alternative: Higher value, monetary rewards *are permissible...IF:*
 - ✓ Evidence-based, protocol-driven, for clinical treatment needs
 - ✓ Individualized with clinical documentation of behavioral targets
 - ✓ Rigorously accounted/auditable, noting each payment for each purpose



Considerations for CM Implementation

► FOUNDING PRINCIPLES

The 3 Essential Elements



- ① Target behaviors must be readily detected
- ② Tangible reinforcers are provided whenever the targeted behavior is demonstrated
- ③ When the target behavior does not occur, the reinforcers are withheld



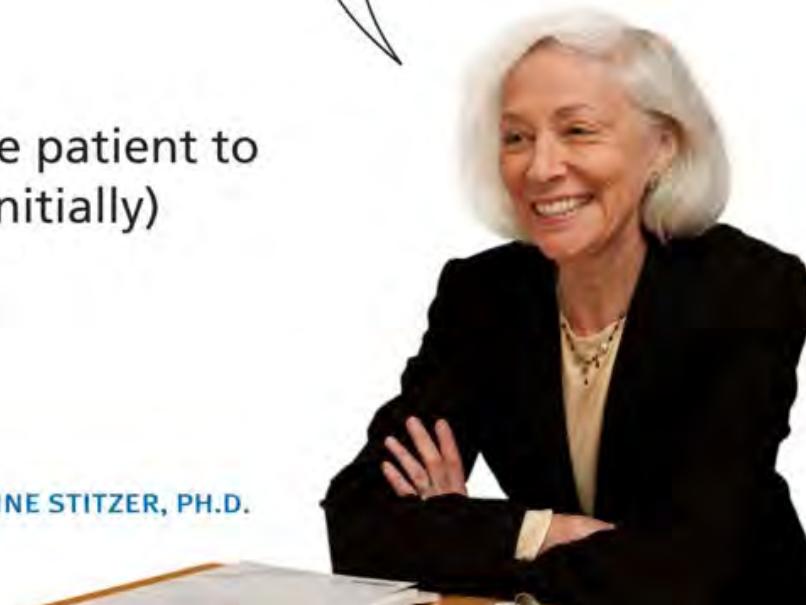
► FOUNDING PRINCIPLES

1. Identify Target Behavior

A target behavior should be:

- Problematic and in need of change
- Observable
- Measurable
- Relatively easy for the patient to accomplish (at least initially)

What behavior will you target with incentives?



MAXINE STITZER, PH.D.

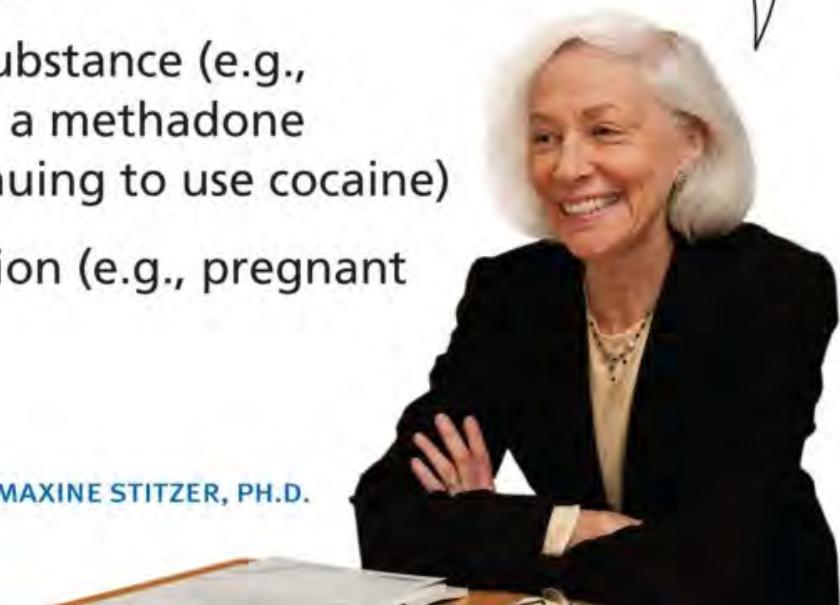
► FOUNDING PRINCIPLES

2. Choice of Target Population

EXAMPLES:

- Patients not responding to treatment
- Newly enrolled patients
- Users of a specific substance (e.g., patients enrolled in a methadone program and continuing to use cocaine)
- Vulnerable population (e.g., pregnant women)

Who will you target
with reinforcement-based
interventions?



MAXINE STITZER, PH.D.

► FOUNDING PRINCIPLES

3. Choice of Reinforcer

- May be different from what you want or like to do—and it is not what you think is good for the patient
- Critical to view from patients' perspectives, or you will compromise effectiveness

It must be something the patient wants or likes to do.



MAXINE STITZER, PH.D.

► FOUNDING PRINCIPLES

3. Choice of Reinforcer continued

Three major types of incentive programs

- **Access to clinic privileges**

Example: Take-home dose of methadone

- **On-site prize distribution**

Example: A prize cabinet contains many small prizes, some large prizes and a few jumbo prizes

- **Vouchers or other token economy systems**

Example: Points or vouchers are accumulated in an account and redeemed for retail goods or services



Sample Voucher-Based Reinforcement Schedule

	Monday	Wednesday	Friday	Bonus (all 3 negative)	Weekly Total
Week 1	\$2.50	\$3.75	\$5.00	\$10	\$21.25
Week 2	\$6.25	\$7.50	\$8.75	\$10	\$32.50
Week 3	\$10.00	\$11.25	\$12.50	\$10	\$43.75
Week 4	\$13.75	\$15.00	\$16.25	\$10	\$55.00

Maximum possible first month total: \$152.50. A methamphetamine-positive urine sample receives no voucher for the day and resets the voucher value to \$2.50. Voucher value can be restored to the previous level by submitting 3 methamphetamine-free urine samples. Halting escalation of voucher values at \$16.25, the maximum potential earnings per client in months 2 and 3 would be \$235. Total for all 12 weeks = \$622.

► FOUNDING PRINCIPLES

4. Incentive Magnitude

- Will determine the degree to which the intervention is effective
- Should be able to compete with reinforcement derived from the behavior targeted for change
- Increases as the desired behavior is repeated

The Fishbowl Method gives patients the opportunity to win prizes of varying magnitude.



NANCY PETRY, PH.D.

⦿ FOUNDING PRINCIPLES

5. Frequency of Incentive Distribution

- Can the targeted behavior be reinforced frequently?
- What method will be used to distribute incentives?
- How often will the incentive be distributed?



► FOUNDING PRINCIPLES

6. Timing of Incentive

- Immediacy is important
- Poor timing can undermine the most well-planned intervention

I earn a point for each recovery meeting I attend weekly.



► **FOUNDING PRINCIPLES**

7. Duration of Intervention

How long?

Until the patient...

- Internalizes the recovery process
- Develops naturally-occurring reinforcers that support recovery





Community Reinforcement Approach (CRA)

Community Reinforcement Approach



- Community Reinforcement Approach (CRA) is a combination of behavioral strategies to
 - Identify the role of environmental contingencies in encouraging or discouraging substance use
 - Rearrangement of these contingencies so that a non-substance using life is more rewarding than a using one.

Components of CRA

- CRA Components include:
 - behavioral skills training
 - social and recreational counseling
 - marital therapy
 - motivational enhancement
 - job counseling
 - relapse prevention
- For application to the treatment of cocaine dependence, a voucher based reinforcement program is added.

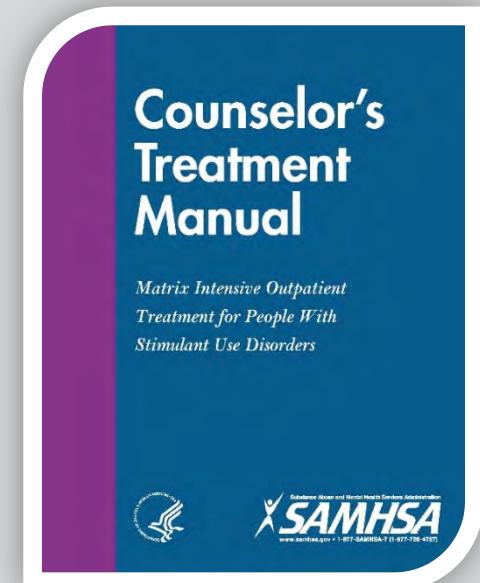
Evidence for Community Reinforcement Approach

- Comparing CRA to standard drug treatment:
 - Increased rates of treatment completion
 - Greater rates of abstinence during treatment
- CRA in combination with CM:
 - Were more likely to complete treatment
 - Had longer continuous abstinence during treatment
 - Had more improved measures of drug/psych problems
- CRA in combination with CM:
 - Reduced use of cocaine during treatment
 - Improved psychological and employment functioning during treatment and at 6-month follow up

SOURCES: De Crescenzo et al., 2018; Higgins et al., 2003;
Copeland & Sorenson, 2001; Higgins et al., 1994; Higgins et al., 1993

Behavioral Approach: Matrix Model

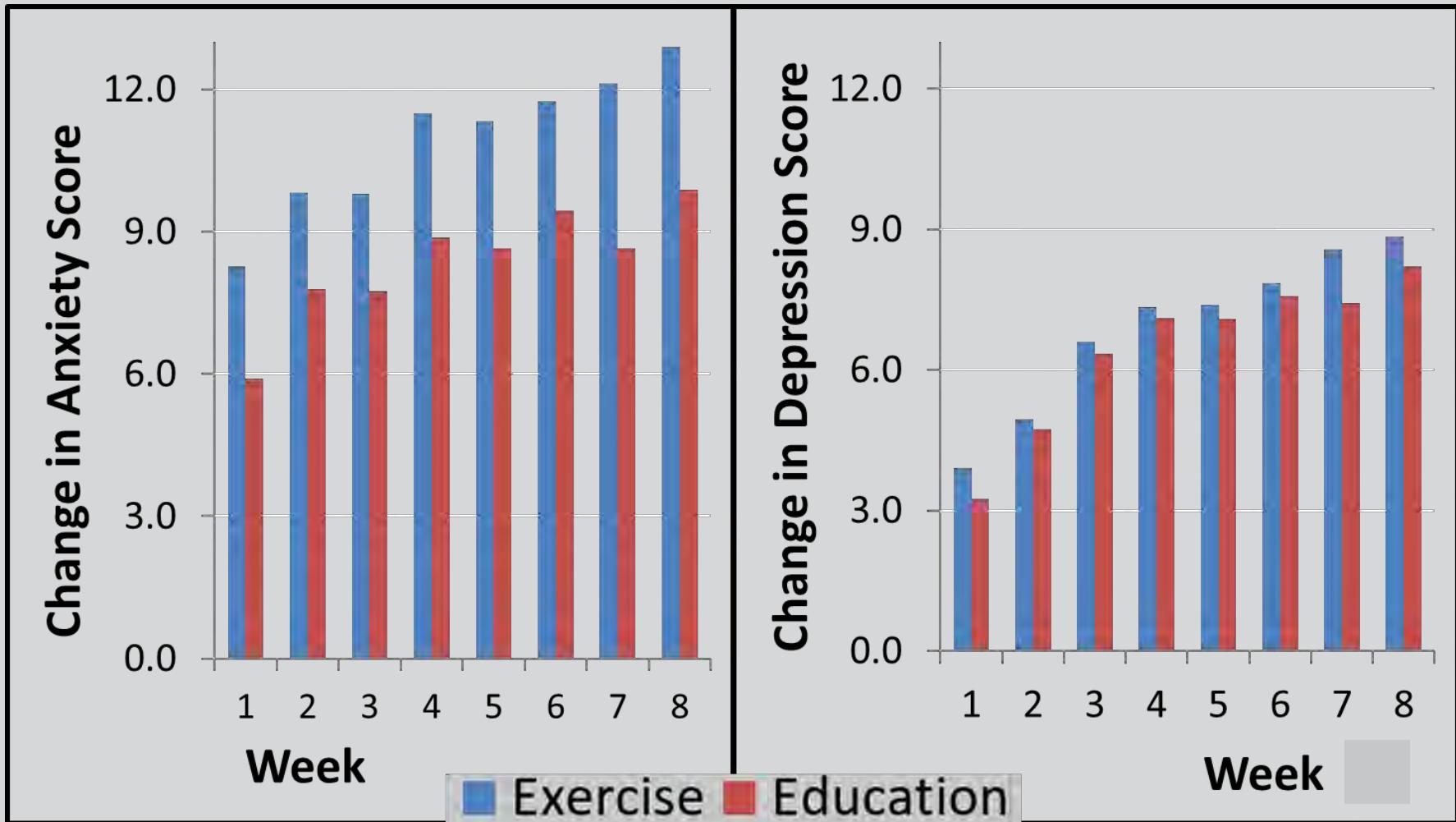
- 16-week intensive outpatient treatment was modestly better treatment as usual to improve retention and reduce methamphetamine use
- Therapist functions as teacher and coach
- Incorporates a variety of approaches
 - CBT
 - CM
 - MI
 - 12-Step Facilitation
 - Family Involvement
 - Person-centered therapy



Does Exercise Improve Outcomes Post-Treatment?

- Yes!
- Fewer exercise participants returned to meth use compared to the education participants at 1-, 3-, and 6-months post-discharge (not statistically significant)
- Significant interaction found for self-reported meth use and meth urine drug test results – lower severity users in the exercise group reported using meth significantly fewer days at the three post-discharge time points than lower severity users in the education group
- Lower severity users in the exercise group also had a lower percentage of positive urine results at the three time points than the lower severity users in the education group (relationships not seen in higher severity groups)

The Impact of Exercise on Depression and Anxiety Symptoms



Recovery Supports for People who Use Stimulants



Resolving alcohol and other drug problems is not just a matter of abstinence or symptom reductions, but ...

improvements in functioning, psychological well-being, and Quality of Life.





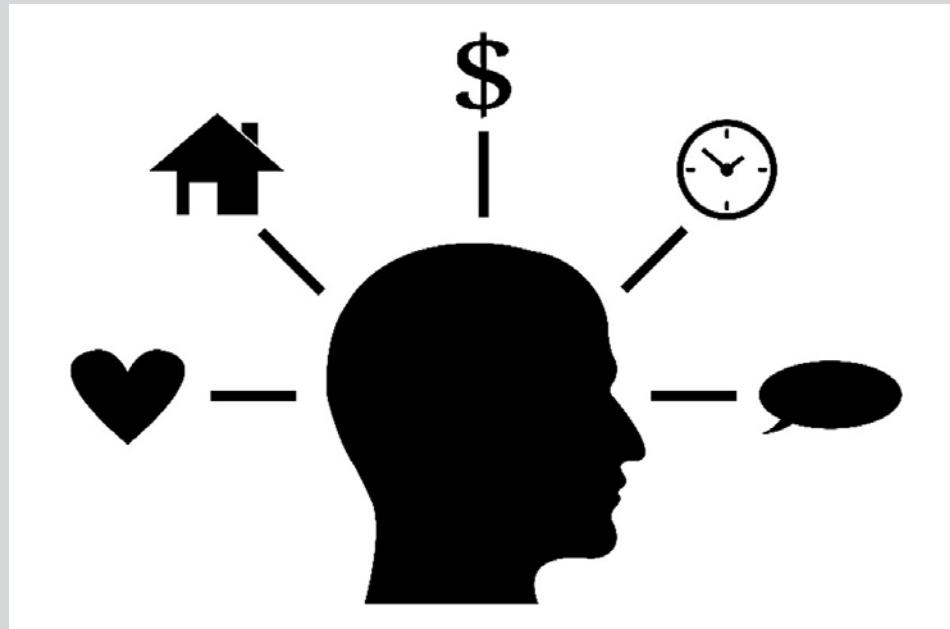
SAMHSA's working definition of *Recovery from Mental Disorders and/or Substance Use Disorders:*

“A process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential.”

SAMHSA

**has delineated
4 major dimensions
that support a life in RECOVERY
Health, Home, Purpose, & Community**

'recovery capital' refers to the sum of resources necessary to initiate and sustain recovery from substance misuse



Key Components of Recovery Capital



- **Social capital** – the sum of resources each person has as a result of their relationships, and includes both support from and obligations
- **Physical capital** – tangible assets, such as property and money
- **Human capital** – the skills, positive health, aspirations and hopes, and personal resources that will enable the individual to prosper
- **Cultural capital** – the values, beliefs and attitudes that link to social conformity

‘Individuals who have access to more resources are found to handle issues with substance use more adequately’ (Advisory Council on the Misuse of Drugs, 2014) (Dekkers, et al., 2020 p.283)

Recovery Benchmarks

Important to:

- differentiate between the needs of peers in early, middle, and late recovery stages
- understand risk factors that can negatively impact recovery



Early Recovery



things may get worse before they get better—notably, happiness and self-esteem appear to drop during the first few months followed by a gradual increase beginning 6 to 12 months into recovery.

Barriers to Methamphetamine Recovery

- **Internal Perceived Barriers**
 - Low Self-Efficacy
 - Conflicting Thoughts About Meth Use
 - Side Effects of Withdrawal
- **External Barriers**
 - Escaping the Drug Environment
 - Friends/Family Hindering Recovery
 - Difficulties with Treatment Services

Drugs
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Addicted to the 'life of methamphetamine': Perceived barriers to sustained methamphetamine recovery

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Perceived Internal Barriers to Methamphetamine Recovery



– Low-Self Efficacy

- feeling powerless and resigned to lifetime use of meth; quit attempts were viewed as temporary or futile; no examples of successful recovery

– Conflicting Thoughts About Meth Use

- feeling conflicted about ability to abstain from meth, desire to sustain recovery but also desire to use –
'I cry out for help- but seek or want none'

– Side Effects of Withdrawal

- negative side effects of abstinence- depression, anxiety, weight gain, craving, etc. are perceived to be more challenging than continued use

External Barriers to Methamphetamine Recovery



– The Life of Methamphetamine

- quitting methamphetamine and the life associated with it is difficult (giving up friends, activities, etc.) *'I was addicted to the life that comes with using, just as much as I was addicted to the drug... walking away from the life was difficult, and it is a struggle every day'*

– Friends/Family Hindering Recovery

- Friends/family overtly and/or covertly support continued use or the person felt isolated in recovery and received no support while in recovery

– Difficulties with Treatment Services

- some difficulty entering treatment (costs, sessions scheduled during work hours, wait list times, high demands, etc.)
- negative beliefs about treatment due to stigmatizing experiences and/or cultural beliefs about 'doing it on their own'

While the process of recovery from drug dependence entails prolonged and sustained effort, the discrete **turning points** at which drug users decided to abstain from or resume drug use also could be dictated by subtle or even unknown factors.

However, these transitions to recovery... occur more frequently when a **turning point** was closely connected... with access to **Recovery Capital (social, physical, human, cultural)**... through **social connectedness**.

12-Step Involvement



- Although 12-step attendance has been associated with greater rates of abstinence from both alcohol and other illicit drugs, including stimulants, **participation in 12-step activities** may be a better predictor of abstinence than attendance (Hatch-Maillette, et al., 2016; Wendt et al., 2017)
- Introducing and preparing patients on how to best use 12-step meetings in their recovery, compared to simply urging attendance alone, may lead to more positive changes in beliefs and attitudes
- These benefits have been shown to be greater than benefits resulting from mere meeting attendance (Crape et al., 2002; Witbrodt et al., 2012)
- Little research on the use of Cocaine Anonymous and Crystal Meth Anonymous by individuals with stimulant use disorders

Recovery Community Organizations (RCOs)



A **recovery community organization (RCO)** is an independent, non-profit organization led and governed by representatives of local communities of recovery that does any, one, or combination of the following activities. These activities are available to all community members and are not restricted to individuals enrolled in a specific educational, treatment, or residential program.

Concluding Thoughts



- The availability and use of cocaine and methamphetamine is widespread across the U.S. and beyond
- Central nervous system stimulants effect multiple organ systems, including the brain, heart, lungs, kidneys, liver, and skin
- The brain does have the ability to heal from use of stimulants, it just takes time
- A variety of behavioral interventions have been shown to be effective
- No FDA-approved medications exist (yet)
- Recovery is possible

Resources for Continued Learning



- ATTC Network's Focus on Stimulant Misuse Web Page:
<https://attcnetwork.org/centers/global-attc/focus-stimulant-misuse>
- Evidence-Based Resource Guide Series: Treatment of Stimulant Use Disorders:
<https://store.samhsa.gov/product/Treatment-of-Stimulant-Use-Disorder/PEP20-06-01-001>
- Northwest ATTC's Contingency Management for Healthcare Settings Self-Paced Online Course:
<https://healtheknowledge.org/course/search.php?search=Contingency+Management>

Stimulant 101 National Curriculum



- Core Daylong Curriculum
- Condensed Three-Hour Virtual Overview
- 70-minute Keynote Presentation
- Supplemental Modules
 - Child welfare issues, gender differences, stimulant use in the context of polysubstance use, rural vs. urban differences, methamphetamine use and HIV among MSM, stimulants and HIV, and recovery approaches
- Culture Modules
 - Stimulant Use in African American, American Indian/Alaska Native, and Latinx Populations

Thank You For Your Time



- For questions, please contact Beth (brutkowski@mednet.ucla.edu) or Thomas (tfreese@mednet.ucla.edu)
- The various components of the ATTC Stimulant 101 curriculum will be posted in fall 2020 to <https://attcnetwork.org/centers/global-attc/focus-stimulant-misuse>
- For additional information regarding SUD treatment-related Training/TA, please visit: <http://www.attcnetwork.org>
- For additional information regarding HIV/AIDS-related Training/TA, please visit: <https://aidsetc.org/>