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Treatment for Stimulant Use Disorder:
Maximizing Evidence Based Practices

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1



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2

Clinical Challenges for Individuals with Methamphetamine Use Disorder

- Overdose death
- Limited understanding of stimulant addiction
- Ambivalence about need to stop use
- Impulsivity/Poor judgement
- Cognitive impairment and poor memory
- Paranoia



3

Clinical Challenges with Individuals with Methamphetamine Use Disorder

- Anhedonia
- Hypersexuality/Hyposexuality
- Violence and psychosis
- Powerful Pavlovian trigger-craving response
- Very poor retention in outpatient treatment



4

Special Treatment Consideration Should Be Made for the Following Groups

- People who inject methamphetamine.**
- People who use methamphetamine daily.**
- Women (high rates of physical/sexual abuse).
- Homeless, chronically mentally ill and/or individuals with high levels of psychiatric symptoms at admission.
- Men who have sex with men (MSM).
- People who use stimulants who are under the age of 21.
- Individuals in medication treatment for OUD.



5

Interest in Reducing Methamphetamine and Opioid Use among Syringe Services Program Participants in Washington State

McMahan et al, 2020 Drug and Alcohol Dependence

- In a sample of 583 participants at a Washington State syringe exchange program (443 opioids; 140 methamphetamine), survey data were collected on their attitudes about stopping drug use.
- 82% of the individuals who reported opioids as their main drug expressed an interest in reducing/stopping opioid use
- 46% of individuals who reported methamphetamine as their main drug expressed an interest in reducing/stopping their meth use.



6

Treatment for Individuals with Stimulant Use Disorder



7

Lappan SN, Brown AW, Hendricks PS. Dropout rates of in-person psychosocial substance use disorder treatments: a systematic review and meta-analysis. *Addiction*. 2020 Feb;115(2):201-217. doi: 10.1111/add.14793.



8

Dropout rates of in-person psychosocial substance abuse treatment: a systematic review and meta-analysis (Lappan et al., *Addiction*, 2020)

- Meta-analysis of in-person psychosocial SUD treatment.
- Drop out rates in first 90 days of treatment
- 151 studies, with 26,243 participants.
- Results yielded overall average dropout rates, and predictors of dropout.



9

Substance Targeted and Dropout

| Treatment Target | Dropout Rate |
|------------------|--------------|
| Heroin | 25.1 |
| Tobacco | 25.5% |
| Alcohol | 26.1% |
| Cocaine | 48.7% |
| Methamphetamine | 53.5% |



10

Do Individuals who use methamphetamine respond differently to behavioral treatments than individuals who use cocaine?

In published research studies where treatment response to behavioral treatments have been compared with individuals who use cocaine vs individuals who use methamphetamine, there is:

No evidence of differential treatment response .



11

Systematic Reviews and Meta-analyses



12

PLOS MEDICINE

RESEARCH ARTICLE

Comparative efficacy and acceptability of psychosocial interventions for individuals with cocaine and amphetamine addiction: A systematic review and network meta-analysis

Francesco De Crescenzo^{1,2,3}, Marco Ciabattini⁴, Gian Loreto D'Alò⁵, Riccardo De Giorgi⁶, Cinzia Del Giovane⁶, Carolina Casar⁷, Luigi Janiri⁸, Nicolas Clark⁹, Michael Joshua Ostroff¹⁰, Andrea Cipriani¹¹*

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Check for updates

PLOS Medicine | December 26, 2018

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13

Meta-analysis findings DeCrescenzo, et al, 2018.

Network meta-analysis was used to analyze 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.

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14

Psychosocial Interventions for Cocaine and Psychostimulant Amphetamines Related Disorders. Werner Paulo Knapp, Bernardo Soares, Michael Farrell, Mauricio Silva deLima, (2009) The Cochrane Collaboration.

Twenty-seven randomized controlled studies (3663 participants) fulfilled inclusion criteria and had data that could be used for at least one of the main comparisons.

- The comparisons between different type of behavioral interventions showed results in favor of treatments with some form of contingency management in respect to both reducing dropouts and lowering cocaine use.

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15

Responding to global stimulant use: Challenges and opportunities Lancet (Farrell et al, 2019)

Psychosocial interventions other than contingency management have weak and non-specific effects on stimulant problems and there are no effective pharmacotherapies. Substantial research investment is needed to develop more effective, innovative, and impactful prevention and treatment.



16

Non-pharmacological interventions for methamphetamine use disorder: a systematic review AshaRani, PV, et al. Drug and Alcohol Dependence, 2020

- 44 Studies reviewed.
- Conclusions: While Contingency Management (CM) interventions showed the strongest evidence favoring the outcomes assessed, tailored CBT alone or with CM was also effective in the target population.



17

Ronsley C, Nolan S, Knight R, Hayashi K, Klimas J, Walley A, et al. (2020) Treatment of stimulant use disorder: A systematic review of reviews. PLoS ONE 15(6): e0234809. <https://doi.org/10.1371/journal.pone.0234809>



18

**Treatment of stimulant use disorder:
A systematic review of reviews**
Ronsley et al., 2020

- Synthesize available evidence on psychosocial and pharmacologic interventions for the treatment of stimulant use disorder.
- Identify the most effective treatments.
- Highlight gaps for future study.




19

Interventions reviewed

- 29 reviews resulted.
- 11 interventions were examined:
 - Contingency management
 - Cognitive behavioral treatment
 - Acupuncture
 - Antidepressants (e.g., fluoxetine, bupropion)
 - Dopamine agonists (e.g., levodopa)
 - Antipsychotics (e.g., aripiprazole)
 - Anticonvulsants (e.g., topiramate)
 - Disulfiram
 - Opioid agonists (e.g., buprenorphine, methadone)
 - N-acetylcysteine (for acetaminophen overdose)
 - Psychostimulants (e.g., modafinil, methylphenidate)




20

Conclusions

- The strongest body of evidence was for contingency management.
- Of pharmacologic treatments, psychostimulants appear to be the most promising, but data are insufficient to support clinical use and further research is necessary.
- Some positive results for opioid agonist treatment, n-acetylcysteine, disulfiram, and antidepressants.
- All other interventions found predominantly negative results.




21

Contingency Management (also known as Motivational Incentives)



22

Contingency Management

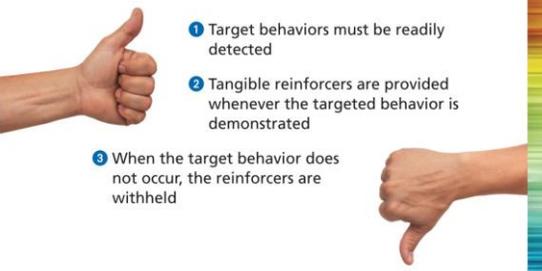
A technique employing the systematic delivery of positive reinforcement for desired behaviors. In the treatment of methamphetamine dependence, vouchers or prizes can be "earned" for submission of methamphetamine-free urine samples or for attendance at treatment sessions.



23

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

24

FOUNDING PRINCIPLES

Founding Principles

1. Identify Target Behavior
2. Choice of Target Population
3. Choice of Reinforcer
4. Incentive Magnitude
5. Frequency of Incentive Distribution
6. Timing of Incentive
7. Duration of Intervention



25

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?



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26

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?



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27

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.

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33

28

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



34

29

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.



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35

30

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?



36

31

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.

37

32

FOUNDING PRINCIPLES

7. Duration of Intervention

How long?

Until the patient...

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



38

33

Course Content

- Why Use Motivational Incentives?
- Definitions
- History & Research
- Founding Principles
- **Low Cost Incentives**
- Perspectives



39

34

LOW COST INCENTIVES

Managing the Cost

- **MIEDAR** studies focused on managing the cost and efficacy of incentives
- **Fishbowl Method** – patients select a slip of paper (or ticket) from a Fishbowl
- Behavior is reinforced immediately
- Patient draws from the Fishbowl immediately after a drug-free urine screen
- Patient exchanges prize slip for a selected prize from the cabinet

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40

35

LOW COST INCENTIVES

Fishbowl Ticket Ratios

To manage cost, ticket ratios are as follows:



| TICKET | COST | CHANCE |
|----------|------------|--------|
| Good Job | \$0 | 50.0% |
| Small | \$1 | 41.8% |
| Large | \$20 | 8.0% |
| Jumbo | \$80-\$100 | 0.2% |

41

36

LOW COST INCENTIVES

Fishbowl Method

Patients select an increasing number of draws each time they display a targeted behavior.

- Get one draw for the first drug-free urine sample, two draws for the second drug-free urine sample, and so on
- Lose the opportunity to draw a prize with a positive urine screen, but are encouraged and supported
- When patients test drug-free again, they start with one draw



37

LOW COST INCENTIVES

Challenges



Isn't this just rewarding patients for what they should be doing anyway?

That's a common concern. But sometimes the problem is that patients are not doing the things that are good for them and need a motivational boost!

38

Contingency Management for the Treatment of Methamphetamine Use Disorder: A Systematic Review

Brown and DeFulio, 2020

- A review of 27 studies.
- All included a contingency management intervention for methamphetamine users.
- Outcomes:
 - Drug abstinence
 - Retention in treatment
 - Attendance/treatment engagement
 - Sexual risk behavior
 - Mood/affect
 - Treatment response predictors



39

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.



40

Three Major Challenges to using CM

- Medicaid regulations that restrict the amount of incentives that can be given to patients to \$75 per patient per year.
- Where does the funding for incentives come from?
- 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.....



41

Current status of Treatment Approaches for Methamphetamine Use Disorder

- Contingency management unanimously (5 systematic reviews and meta-analyses) found to have best evidence of effectiveness.
- Other approaches with less but clear evidence of support: Cognitive Behavioral Therapy (CBT) and Community Reinforcement Approach (CRA).
- Approach with evidence for treatment of a broad variety of SUD: Motivational Interviewing (MI).
- Approach with recent studies showing benefit to methamphetamine users: Physical Exercise (PE) (e.g., Rawson et al., 2015).



42

Community Reinforcement Approach (CRA)



43

Community Reinforcement Approach

Community Reinforcement Approach (CRA) is a combination of behavioral strategies that address the role of environmental contingencies in encouraging or discouraging drug use, and attempts to rearrange these contingencies so that a non-drug using lifestyle is more rewarding than a using one.



44

Components of CRA

- Behavioral skills training
- Social and recreational counseling
- Marital therapy
- Motivational enhancement
- Job counseling
- Relapse prevention



45

A sample of CRA Topics

- Functional Analysis
- Drug Refusal Skills
- Social Skills/Assertiveness Training
- Social Recreational Counselling
- Employment Preparation Skills
- Relationship Happiness Scale
- Positive Interactions



46

Cognitive Behavioral Therapy

- CBT is a form of “talk therapy” based on principles of social learning theory.
 - Used to teach, encourage and support individuals in reducing or stopping their harmful drug use
 - Provides skills aimed at sustaining abstinence
 - Addresses negative thought patterns and helps to develop coping strategies to prevent relapse



47

Motivational Interviewing

- MI aims to help individuals resolve their ambivalence and initiate change positive change in their lives.
- In a recent randomized clinical trial, MI demonstrated positive benefit with decreased MA use and lower cravings in participants receiving MI regardless of intensity.



48

Exercise as a Treatment Intervention for Methamphetamine Dependence



49

Impact of Exercise on Methamphetamine Use Outcomes N=135

Exercise Group:
1h, 3 days/wk

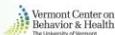


N=69

Health Education Group:
1h, 3 days/wk



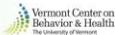
N=66



50

Exercise Summary

- For individuals in the first 100 days of meth recovery, exercise:
 - Improves physical conditioning
 - Reduces weight gain
 - Improves cardiovascular functioning (increases heart rate variability)
 - Reduces symptoms of anxiety and depression
 - Reduces craving for methamphetamine
 - Enhances recovery of dopamine system
 - Reduces relapse to methamphetamine post discharge (except in very heavy users)



51

Medications




52

Medications for Cocaine Use Disorder

Medications with positive studies and under consideration.

- topiramate*
- modafinil*
- bupropion*
- amphetamine salts
- disulfiram (mixed, worse retention)
- propranolol (WD)
- buprenorphine+naltrexone




53

Medications for Methamphetamine Use Disorder

Medications with positive studies and under consideration

- Bupropion/naltrexone
- mirtazapine
- bupropion
- naltrexone
- methylphenidate
- d-amphetamine
- topiramate




54

Chan B, Freeman M, Ayers C, Korthuis PT, Paynter R, Kondo K, Kansagara D. A systematic review and meta-analysis of medications for stimulant use disorders in patients with co-occurring opioid use disorders. Drug Alcohol Depend. 2020 Nov 1;216:108193. doi: 10.1016/j.drugalcdep.2020.108193. Epub 2020 Aug 1. PMID: 32861136.



55

Background

- The use of stimulants by people with opioid use disorder has increased greatly.
- Untreated stimulant use disorders are associated with poorer outcomes for OUD.
- This was a review of the evidence for medications for stimulant use disorder specifically for people with co-occurring OUD.



56

Discussion

- An examination of multiple classes of medications used for the treatment of cocaine and methamphetamine use disorders in people with OUD found no strong evidence that any was effective in increasing abstinence, reducing use, or improving retention.
- There is almost no evidence regarding treatment of methamphetamine use disorder in people with OUD.
- Antidepressants and disulfiram may worsen treatment outcomes when used for treatment of cocaine use disorders in patients with OUD.



57

TRUST: Treatment of Individuals who Use Stimulants: TRUST

An Integrated Behavioral Model



58

TRUST: The Components

TRUST is an integrated, evidence-based, multi-component program for the treatment of individuals with stimulant use disorders. The contents include:

1. Motivational incentives (based on contingency management research),
2. Elements of cognitive behavioral therapy
3. Elements of community reinforcement approach,
4. Motivational interviewing skills,
5. Physical exercise

Participation in recovery support programs encouraged (eg. 12-Step; Moderation management).

Appendix includes other EBPs to augment the core program at the discretion of each organization.



59

TRUST: The Priorities

- 1. Establish a positive, compassionate, non-judgemental relationship with individuals who use stimulants to promote their engagement and retention in treatment
- 2. Provide incentives to promote participation (retention) in treatment. Retention is the single most important measure of treatment benefit.
- 3. Provide respectful evidence-based guidance/information/support to individuals who use stimulants that can help them make changes in their lives to promote a reduction/discontinuation of methamphetamine/cocaine use.



60

TRUST Training Program

- Eight 2 hour zoom training sessions
- Bi-monthly coaching/mentoring zoom sessions beginning two weeks after the last training session for 3 months, followed by a monthly mentoring session for an additional 7 months.
- A minimal amount of data on number of patients, retention in treatment and UA data (If possible) collected and submitted weekly



61

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62
