

Stimulants 2023: Clinical Challenges, Current Treatments

December 18, 2023

This project was supported by Grant No. 2019-AR-BX-K061 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking. Points of view of the presenters are those of the speakers and do not necessarily represent the official position or policies of the U.S. Department of Justice.

Welcome and Introductions

Presenter

Richard Rawson, Ph.D.

- Research Professor, Vermont Center for Behavior and Health
University of Vermont, Burlington, Vermont.
- Professor Emeritus, Department of Psychiatry and Biobehavioral Sciences
University of California, Los Angeles, California.

Objectives

- Discuss clinical challenges for stimulant use disorders.
- Describe treatment options for stimulant use disorders.

Clinical Challenges

Clinical Challenges: Treating Individuals with Stimulant Use Disorder

- Overdose death/lethality of currently available Methamphetamine (MA).
- Limited understanding of stimulant use disorder.
- Ambivalence about need to stop use.
- Impulsivity/poor judgement.
- Cognitive impairment and poor memory.
- Anhedonia (loss of ability to feel pleasure).

(Rawson, 2023)

Treating Individuals with Stimulant Use Disorder (cont.)

- Hypersexuality/hyposexuality.
- Violence and psychosis.
- Powerful Pavlovian trigger-craving response.
- Elevated rates of psychiatric co-morbidity.
- **Very difficult to engage in treatment.**
- **Very poor retention in outpatient treatment.**

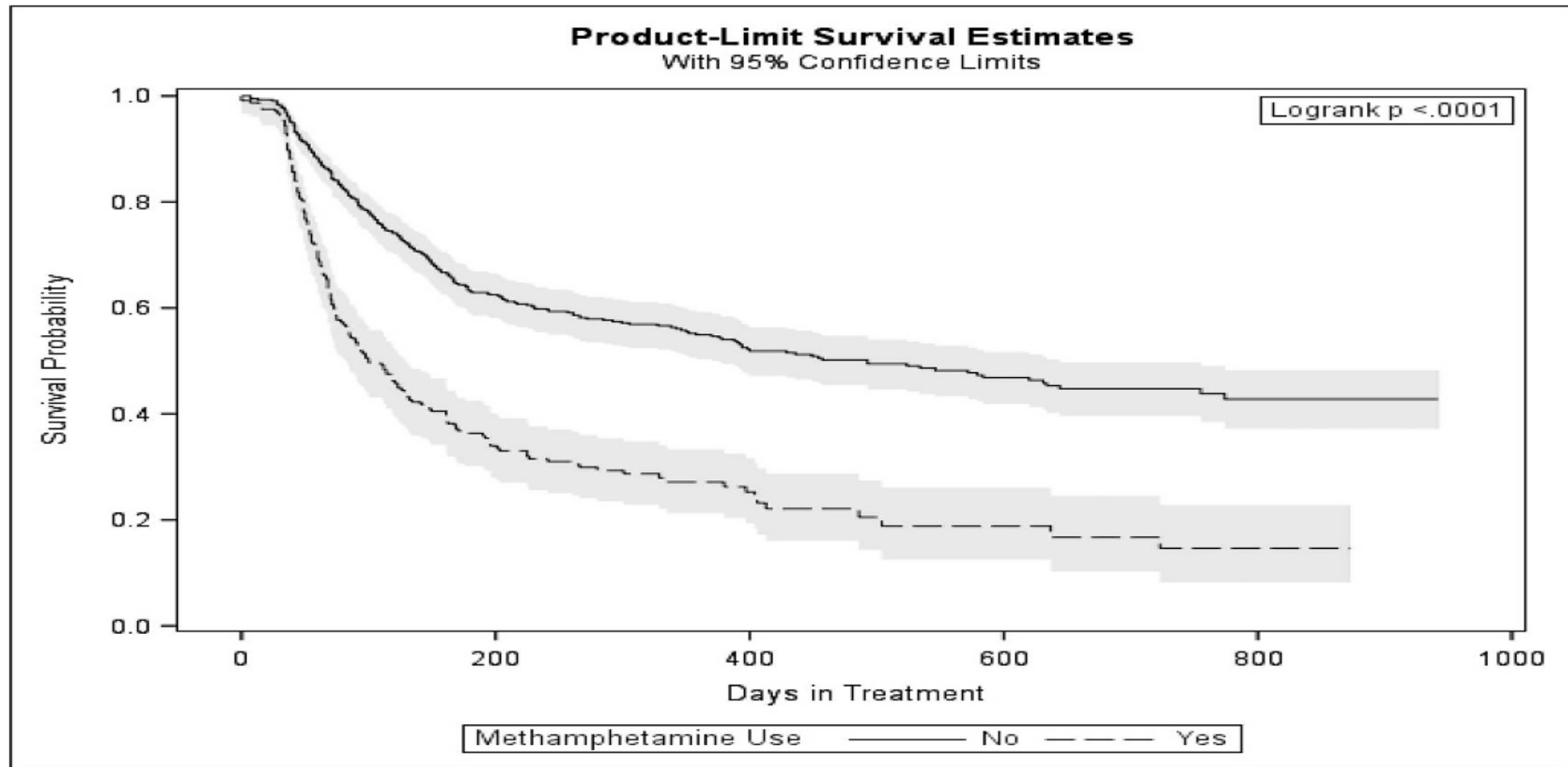
(Rawson, 2023)

Special Treatment Considerations

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

(Rawson, 2023)

Association Between MA Use and Retention Among Patients With OUD Treated With Buprenorphine



(Tsui, et al., 2020)

Interest in Reducing MA and Opioid Use

46%

Of individuals who use MA as their main drug who expressed interest in reducing/stopping their MA use

82%

Of individuals who use opioids as their main drug who expressed interest in reducing/stopping their opioid use

(McMahan, et al., 2020)

Dropout Rates of In-person Treatment

- Meta-analysis of in-person psychosocial substance use disorder treatment yielded overall average dropout rate of 30 percent.

(Lappan, et al., 2020)

Substance Targeted and Dropout Rate

Treatment Target	Dropout Rate
Heroin	25.1%
Tobacco	25.5%
Alcohol	26.1%
Cocaine	48.7%
MA	53.5%

(Rawson, 2023)

Harm Reduction Strategies

- Education
 - Medical and psychiatric effects of MA.
 - Overdose (fentanyl).
 - Syringe exchanges.
 - Naloxone (opioid overdose).
 - Not using drugs alone.
 - Condoms/safe sex.
- Injection “testing.”
- Injection “taking turns.”
- Quiet rooms and wash-up/shower rooms.
- Topical antibiotic creams and ointments for injection sites.

Clinical Management of Individuals Who Use Stimulants: *Acute Psychosis*

- Acute Psychosis Symptoms:
 - Auditory hallucinations.
 - Visual (flashing lights, peripheral artifacts), smell, and tactile sensations.
 - Powerful paranoia and persecutory delusions (extremely common).
- Stimulant-induced Psychosis.
- Risperidone and Olanzapine.
- Monitoring for hyperthermia and dehydration when antipsychotics are used in patients with acute stimulant intoxication.

Clinical Management of Individuals Who Use Stimulants: *Intoxication*

- Symptoms.
 - Euphoria.
 - Hyperexcitability.
 - Hypersexuality.
 - Increased locomotor activity.
 - Agitation.
 - Psychotic symptoms, including paranoia and hallucinations.

Clinical Management Individuals who use Stimulants: *Withdrawal*

- Symptoms.
 - Severe fatigue.
 - Cognitive impairment.
 - Depression and anxiety.
 - Anergia.
 - Confusion.
 - Paranoia.

Difference in Response to Behavioral Treatments

- **No differential treatment response** between individuals who use MA compared to individuals who use cocaine.



Treatment Options

Meta-analysis Findings

- Combination of **Contingency Management (CM)** and **Community Reinforcement Approach (CRA)**—most efficacious and acceptable treatment in short and long term.

(De Crescenzo, et al., 2018)

Psychosocial Interventions for Cocaine and Psychostimulant Amphetamine-related Disorders

- Treatments with **some form of CM** had more favorable outcomes (i.e., reduced treatment dropout rates, cocaine use) when compared to different types of behavioral interventions.

(Knapp, et al., 2007)

Other Psychosocial Interventions

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

(Farrell, et al., 2019)

Interventions for MA Use Disorder

- While CM interventions were most effective, tailored Cognitive Behavioral Therapy (CBT) alone or with CM were also found to be effective for people with MA use disorder.

(AshaRani, et al., 2020)

Treatments for Cocaine Use Disorder

- CM programs were associated with reductions in cocaine use among adults.

(Bentzley, et al., 2021)

CM for Patients Receiving Medication for OUD

- Evidence supports the use of CM in addressing key clinical problems among patients receiving medications for OUD, including those with co-occurring stimulant misuse.

(Bolivar, et al., 2021)

CM for Treatment of MA Use Disorder

- Drug abstinence.
- Increased attendance, engagement, and retention in treatment, including therapy sessions and use of medical and other services.
- Reductions in risky sexual behavior.
- Increases in positive mood affect and decreases in negative affect.

(Brown and DeFulio, 2020)

Treatment of Stimulant Use Disorder

Reviewed Interventions:

- CM.
- CBT.
- 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).

(Ronsley, et al., 2020)

Treatment of Stimulant Use Disorder (cont.)

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

(Ronsley, et al., 2020)

Current Status of Treatment Approaches for MA Use Disorder

- **CM unanimously found to have most robust evidence of effectiveness.** (7 systematic reviews and meta-analyses)
- Other approaches with lesser but evidence of support include CBT and CRA.
- Approach with evidence for treatment of a broad variety of SUD: Motivational Interviewing (MI).
- Approach with recent studies showing benefit to individuals with MA use disorder: physical exercise (e.g., Rawson, et al., 2015).

Contingency Management (AKA Motivational Incentives)

Contingency Management

- A technique employing systematic delivery of positive reinforcement for desired behaviors.
- In the treatment of MA use disorder, vouchers or prizes “earned” for submission of MA-free urine samples or attendance at treatment sessions.



How Much is Enough with CM?

- Science shows – more is better.
 - \$200–300 per month and up to \$1,200 over 12–16 weeks.
- Escalating schedule of incentive values provided for consecutive stimulant-free urine samples or attendance.
 - Patients rewarded for gaining longer stretches of continuous abstinence by increasing incentive value.
 - Amount of incentive reset with stimulant use as evidenced by positive screen.

(Rawson, et al., 2023)

Four Essential CM “Ingredients”

1. Clearly define target behavior.
2. Frequently measure behavior.
3. Provide tangible incentives soon after behavior observed.
4. Withhold incentive when behavior not observed while ***maintaining supportive attitude.***



1. Clearly Define Target Behavior.

Focused

Does not require abstinence from other substances, only stimulants.

Objective

Does not rely on self-report, relies on urine drug test (UDT).

Goal:
Stimulant abstinence measured by point-of-care UDT.

Achievable

2- to 4-day stimulant metabolite detection window means rewards can be earned within first few days of abstinence.

Feasible

Cost effective for frequent use and does not take specialized training.

Essential for positive reinforcement.

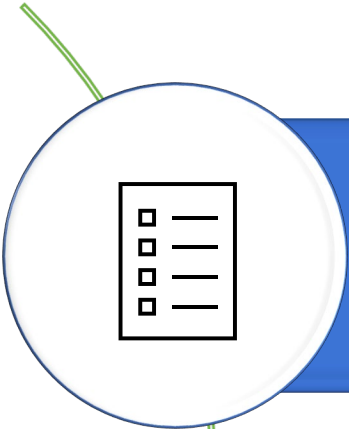
Immediate Results

2. Frequently Measure Behavior.

- Collect urine tests and provide recovery incentives:
 - *2 x per week for weeks 1–12.*
 - *1 x per week for weeks 13–24.*
- Communicate attendance requirements. (Missed visit means missed opportunity for reward and reset of recovery incentive value to baseline.)
- Schedule on non-sequential days (e.g., Mon/Thurs or Tues/Fri).



3. Provide Desirable/Immediate Rewards.



Desirable

- Vendor provides wide array of options for recovery incentives.
- Starting value of \$10 per stimulant-negative UDT, increasing by \$1.50 for every week of non-use of stimulants (i.e., two consecutive stimulant-negative UDTs).



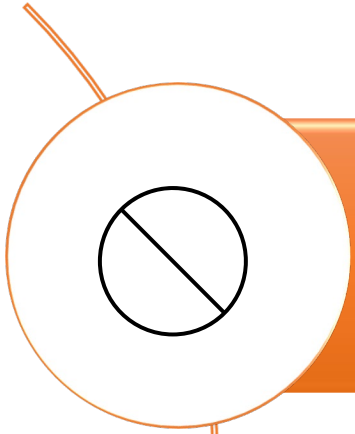
Immediate

- Recovery incentives electronically delivered, with option to print gift cards onsite for those without reliable access to technology.



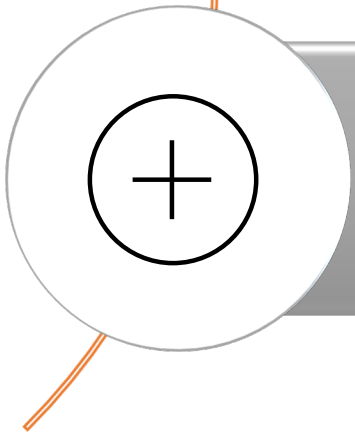
BJA award funds may not be used for prizes, rewards, entertainment, trinkets, or any other monetary incentives, including gift cards.

4. Make Contingent AND Positive.



Contingent

- No incentive given when UDT not submitted or positive for stimulants.



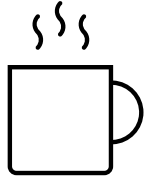
Positive

- Encouragement/support offered without punishment even if UDT positive for stimulants.

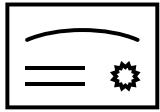
Ingredients for Stimulant-focused CM

- Stimulant abstinence as measured by point-of-care stimulant-negative UDT.
- UDTs and recovery incentives given twice weekly.
- Recovery incentives delivered immediately after stimulant-negative UDT.
- No recovery incentives given when UDT not submitted or positive for stimulants, AND encouragement/support offered without punishment.

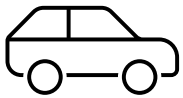
Incentive Programs that are **NOT** CM



- Coffee/donuts provided at meetings.

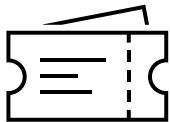


- Certificate and party given at “graduation.”



- A better parking space.

- Candy bars for attendance.



- Random drawing for all given monthly (no defined criteria for being entered in the drawing).

▶ **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!



Community Reinforcement Approach (CRA)

Community Reinforcement Approach (CRA)

- A combination of behavioral strategies that address the role of environmental contingencies in encouraging or discouraging drug use and an attempt to rearrange these contingencies so that a non-drug using lifestyle is more rewarding than a using one.

CRA Components

Behavioral
skills training

Social and
recreational
counseling

Marital
therapy

Motivational
enhancement

Job counseling

Return-to-use
prevention

Sample of CRA Topics

Functional analysis

Drug refusal skills

Social
skills/assertiveness
training

Social recreational
counseling

Employment
preparation skills

Relationship
happiness scale

Positive
interactions

Cognitive Behavioral Therapy (CBT)

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



Motivational Interviewing (MI)

- Helps individuals resolve ambivalence regarding aspects of their life and initiate positive change.
- Demonstrated decreases in MA use and lowered cravings.
- Found to be impactful for women with MA use disorder and alcohol use.



Exercise

Impact of Exercise on MA Use

For individuals in first 100 days of MA recovery, exercise:

- Improves physical conditioning.
- Reduces potential weight gain.
- Improves cardiovascular functioning (increases heart rate variability).
- Reduces symptoms of anxiety and depression.
- Reduces craving for MA.
- Enhances recovery of dopamine system.
- Reduces return to MA use post discharge (except in very heavy users).

(Mooney, et al., 2014)

Medications

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.

Medications for MA Use Disorder

Medications with positive studies and under consideration:

- Bupropion/naltrexone.
- Mirtazapine.
- Bupropion.
- Naltrexone.
- Methylphenidate.
- D-amphetamine.
- Topiramate.

Questions



To access the recording of the first webinar in this series, go to:

Stimulants 2023: Cocaine and Methamphetamine

Contact Information

Dr. Richard Rawson

RRAWSON@UVM.EDU

Stay Connected

Vermont Center on Behavior and Health

- Follow Twitter: [@vtcenterbh](https://twitter.com/vtcenterbh)
- Like Facebook: [@vtcenterbh](https://www.facebook.com/vtcenterbh)
- Follow LinkedIn: [linkedin.com/company/vermont-center-on-behavior-and-health](https://www.linkedin.com/company/vermont-center-on-behavior-and-health)
- Subscribe YouTube: [youtube.com/channel/UCgTdhdZb7GAu8f12EhjcN3g](https://www.youtube.com/channel/UCgTdhdZb7GAu8f12EhjcN3g)
- Website: www.med.uvm.edu/behaviorandhealth/home
- Contact Us: VCBH@uvm.edu

Center on Rural Addiction

- Follow Twitter: [@uvmcora](https://twitter.com/uvmcora)
- Website: uvmcora.org
- Contact Us: CORA@uvm.edu

References

- AshaRani, P. V., Aditi Hombali, Esmond Seow, Wei Jie Ong, Jit Hui Tan, and Mythily Subramaniam. 2020. “[Non-pharmacological Interventions for Methamphetamine Use Disorder: A Systematic Review](#).” *Drug Alcohol Dependence* 212: 108060. Retrieved October 12, 2023 from doi: <https://doi.org/10.1016/j.drugalcdep.2020.108060>.
- Bentzley, Brandon, Summer Han, Sophie Neuner, Keith Humphreys, Kyle Kampman, and Casey Halpern. 2021. “[Comparison of Treatments for Cocaine Use Disorder Among Adults: A Systematic Review and Meta-analysis](#).” *JAMA Network Open* 4(5): e218049. Retrieved October 12, 2023 from doi: <https://doi.org/10.1001/jamanetworkopen.2021.8049>.
- Bolivar, Hypatia, Elias Klemperer, Sulamunn Coleman, Michael DeSarno, Joan Skelly, and Stephen Higgins. 2021. “[Contingency Management for Patients Receiving Medication for Opioid Use Disorder: A Systematic Review and Meta-analysis](#).” *JAMA Psychiatry* 78(10): 1092-1102. Retrieved October 12, 2023 from doi: <https://doi.org/10.1001%2Fjamapsychiatry.2021.1969>.
- Brown, Haley, and Anthony DeFulio. 2020. “[Contingency Management for the Treatment of Methamphetamine Use Disorder: A Systematic Review](#).” *Drug Alcohol Dependence* 216: 108307. Retrieved October 12, 2023 from doi: <https://doi.org/10.1016/j.drugalcdep.2020.108307>.
- De Crescenzo, Franco, Marco Ciabattini, Gian Loreto D’Alò, Riccardo De Giorgi, Cinzia Del Giovane, Carolina Cassar, Luigi Janiri, Nicolas Clark, Michael Joshua Ostacher, and Andrea Cipriani. 2018. “[Comparative Efficacy and Acceptability of Psychosocial Interventions for Individuals with Cocaine and Amphetamine Addiction: A Systematic Review and Network Meta-analysis](#).” *PLOS Medicine* 15(12): e1002715. Retrieved October 12, 2023 from doi: <https://doi.org/10.1371/journal.pmed.1002715>.
- Farrell, Michael, Natasha Martin, Emily Stockings, Annick Bórquez, Javier Cepeda, Louisa Degenhardt, Robert Ali, Lucy Thi Tran, Jürgen Rehm, Marta Torrens, Steve Shoptaw, and Rebecca McKetin. 2019. “[Responding to Global Stimulant Use: Challenges and Opportunities](#).” *Lancet* 394(10209): 1652-1667. Retrieved October 12, 2023 from doi: [https://doi.org/10.1016/s0140-6736\(19\)32230-5](https://doi.org/10.1016/s0140-6736(19)32230-5).
- Knapp, W.P., B.G. Soares, M. Farrel, and M.S. Lima. 2007. “[Psychosocial Interventions for Cocaine and Psychostimulant Amphetamines Related Disorders](#).” *Cochrane Database of Systematic Reviews* July 18(3):CD003023. Retrieved October 12, 2023 from doi: <https://doi.org/10.1002/14651858.cd003023.pub2>.

References (cont.)

- Lappan, Sara N., Andrew W. Brown, and Peter S. Hendricks. 2020. "[Dropout Rates of In-person Psychosocial Substance Use Disorder Treatments: A Systematic Review and Meta-analysis.](#)" *Addiction* 115(2): 201-207. Retrieved October 12, 2023 from doi: <https://doi.org/10.1111/add.14793>.
- McMahan, Vanessa, Susan Kingston, Alison Newman, Joanne D Stekler, Sara N Glick, and Caleb J Banta-Green. 2020. "[Interest in Reducing Methamphetamine and Opioid Use Among Syringe Services Program Participants in Washington State.](#)" *Drug Alcohol Dependence* 216: 108243. Retrieved October 12, 2023 from doi: <https://doi.org/10.1016/j.drugalcdep.2020.108243>.
- Mooney, Larissa, Christopher Cooper, Edythe London, Joy Chudzynski, Brett Dolezal, Daniel Dickerson, Mary-Lynn Brecht, Jose Penate, and Richard A. Rawson. 2014. "[Exercise for Methamphetamine Dependence: Rationale, Design, and Methodology.](#)" *Contemporary Clinical Trials* 37(1):139-147. Retrieved October 12, 2023 from doi: <https://doi.org/10.1016%2Fj.cct.2013.11.010>.
- Rawson, Richard, Joy Chudzynski, Rachel Gonzales, Larissa Mooney, Daniel Dickerson, Alfonso Ang, Brett Dolezal, and Christopher Cooper. 2015. "[The Impact of Exercise on Depression and Anxiety Symptoms Among Abstinent Methamphetamine-dependent Individuals in a Residential Treatment Setting.](#)" *Journal of Substance Abuse Treatment* 57: 36-40. Retrieved October 12, 2023 from doi: <https://doi.org/10.1016/j.jsat.2015.04.007>.
- Rawson, Richard A., Tyler G. Erath, Mady Chalk, H. Westley Clark, Carol McDaid, Sarah Wattenberg, John M. Roll, Michael G. McDonnell, Sara Parent, and Thomas E. Freese. 2023. "[Contingency Management for Stimulant Use Disorder: Progress, Challenges, and Recommendations.](#)" *Journal of Ambulatory Care Management* 46(2):152-159. doi: <https://doi.org/10.1097/jac.0000000000000450>.
- Ronsley, Claire, Seonaid Nolan, Rod Knight, Kanna Hayashi, Jano Klimas, Alex Walley, Evan Wood, and Nadia Fairbairn. 2020. "[Treatment of Stimulant Use Disorder: A Systematic Review of Reviews.](#)" *Public Library of Science* 15(6):e0234809. Retrieved October 12, 2023 from doi: <https://doi.org/10.1371%2Fjournal.pone.0234809>.
- Tsui, Judith, Jim Mayfield, Elizabeth Speaker, Sawir Yakup, Richard Ries, Harvey Funai, Brian Leroux, and Joseph Merrill. 2020. "[Association Between Methamphetamine Use and Retention with Opioid Use Disorders Treated with Buprenorphine.](#)" *Journal of Substance Abuse Treatment* 109: 80-85. Retrieved October 12, 2023 from doi: <https://doi.org/10.1016/j.jsat.2019.10.005>.

Bureau of Justice Assistance's Comprehensive Opioid, Stimulant, and Substance Use Program (COSSUP) Resource Center

The screenshot shows the homepage of the COSSUP Resource Center. At the top left is the COSSUP logo with the text 'Comprehensive Opioid, Stimulant, and Substance Use Program'. To the right of the logo are navigation links: 'Program', 'Topics', 'Learn', and 'Resource Library'. The main content area features a large background image of a diverse group of people. On the left side of this area, the text reads 'DISCOVER IMPACTFUL RESPONSES TO THE OPIOID CRISIS'. Overlaid on the right side of the image is a dark blue interactive menu with the text 'I want to ...'. Below this text is a white dropdown menu with the option 'Find Learning Opportunities' and a downward arrow. Below the dropdown is a blue button with a yellow border labeled 'Get Started'. At the bottom right of the image area is a white button with a blue bell icon labeled 'Subscribe'. At the bottom of the page are two white buttons with rounded corners: 'Site-Based Grants' and 'Request Assistance'.

www.cossup.org

COSSUP Resources

Tailored Assistance—The COSSUP training and technical assistance (TTA) program offers a variety of learning opportunities and assistance to support local, tribal, and state organizations, stakeholders, and projects in building and sustaining multidisciplinary responses to the nation’s substance abuse crisis. ***You do not need to be a COSSUP grantee to request support.*** TTAs are provided in a variety of formats, including virtual and in-person training events, workshop and meeting presentations, and online resources. Request TTA to support your activities at <https://www.cossup.org/Program/TTA/Request>.

Funding Opportunities—Current COSSUP and complementary funding opportunities are shared at <https://www.cossup.org/Program/Funding>.

Join the COSSUP community! Subscribe now at <https://www.cossup.org/Subscription> to receive information on the latest COSSUP webinars, newsletters, funding opportunities, announcements, and more.

COSSUP Jail Resources

COSSUP's Jail Resources serves as a central hub for jail administrators, correctional staff, and health care professionals to easily locate information, guidance, tools, online learning opportunities, and technical assistance supporting a comprehensive approach for individuals with substance use disorder consisting of withdrawal management, substance use treatment, and recovery services while detained and upon reentry.

<https://www.cossup.org/Topics/CourtsCorrections/JailResources>

Asking a question—to submit a question about withdrawal management or implementation of the guidelines, please email:

Guidelines@ahpnet.com

Requesting TTA—If you would like assistance with implementing the guidelines, please complete the TTA request form:

<https://www.cossup.org/Topics/CourtsCorrections/JailResources/Guidelines/TTARequest>

