

Methamphetamine Use in Hepatitis C: An Ambulatory Approach

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Objectives

- Briefly review stimulant use disorder epidemiology, stimulant pharmacology, and ambulatory intoxication/withdrawal syndromes
- Discuss pharmacotherapies and psychosocial behavioral treatments for stimulant use disorder

Epidemiology

- In 2020...
 - ~ 24,000 people died from an overdose involving methamphetamine
 - Those aged 12+
 - 0.9% (~ 2.6 million people) reported using meth
 - 0.6% (~1.5 million people) reported methamphetamine use disorder
 - 0.2% of 8th, 10th, and 12th graders reported using meth
- Since 2016...
 - Methamphetamine use, use disorders, and overdoses have all more than doubled *each year*

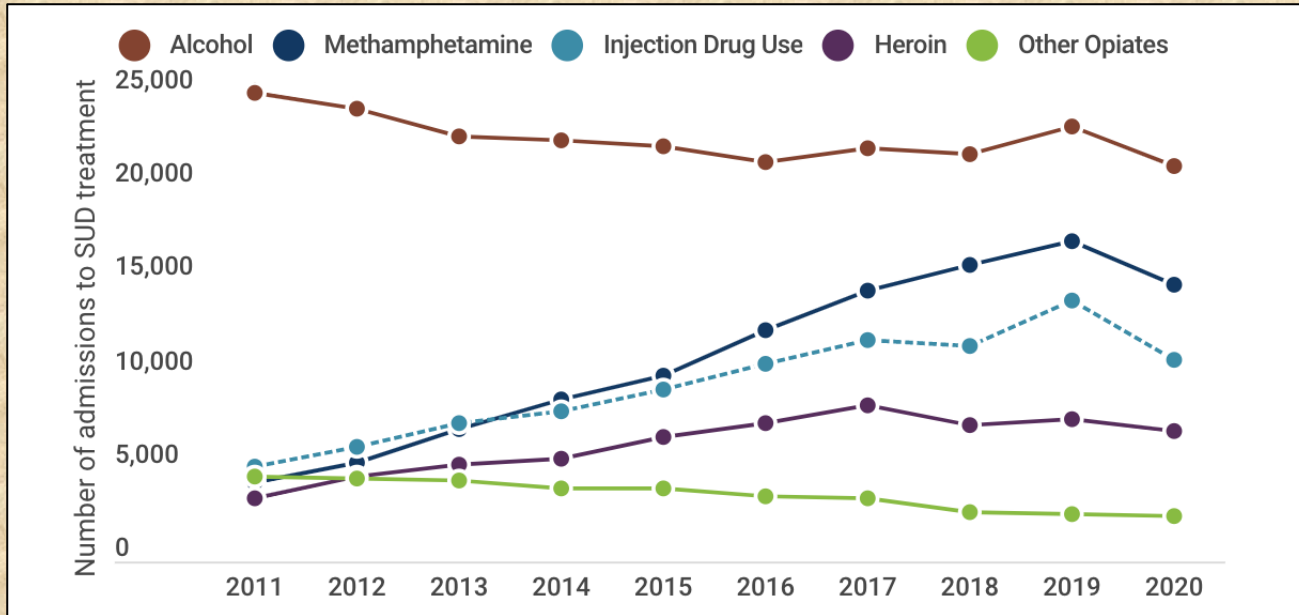
Methamphetamine and Opioids

- Methamphetamine may serve as an opioid substitute or provide synergistic euphoria
- Meth use increasing:
 - People who misuse opioids
 - People admitted for opioid treatment
- Since 2017, >50% of meth overdose deaths have involved opioids

Methamphetamine Use and Hepatitis C

- Meth misuse ↑ risk of contracting or transmitting HIV, HBV, and HCV
 - Both PWID and in those who do not
- PWID → spread mainly via re-use/sharing of contaminated paraphernalia
- Meth misuse associated with a culture of risky sexual behavior
 - Both men who have sex with men and heterosexual populations

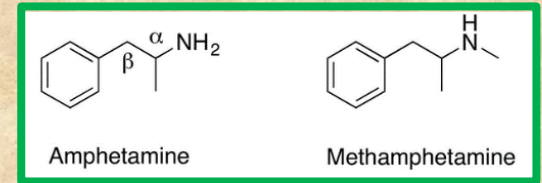
Minnesota: Admissions to SUD treatment



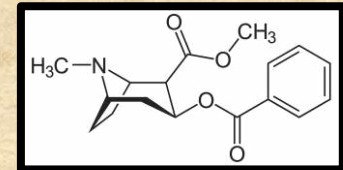
Pharmacology: Stimulants



- Potentiate the effects of catecholamines (DA, NE, Epi) and serotonin
 - Inhibit reuptake and/or metabolism
 - Increase release
 - Directly potentiate adrenergic effects



- Cocaine
 - Cardiotoxic acutely
 - EKG



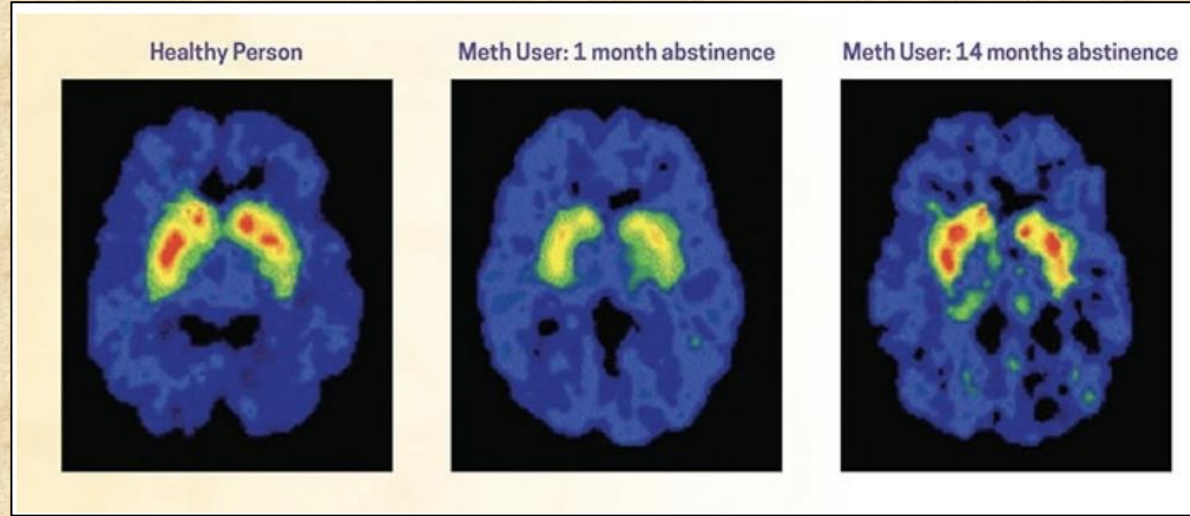
The Intoxicated Patient in Clinic

- Intoxication = excessive catecholamines → sympathomimetic effects
 - Agitation/delirium/psychosis (seizures)
 - Neuromuscular excitation (hyperthermia)
- *What if someone shows up intoxicated to clinic?*
- Often combined with other drugs:
 - Gamma-hydroxybutyrate, benzodiazepines, opioids/fentanyl
- Management:
 - De-escalation/redirection, 1:1, low-stimuli environment
 - Olanzapine

Chronic Toxicity

- Cognitive effects
- Behavior changes
- Movement disorders
- CM/myocarditis
- Malnutrition
- Dental problems

- PWID
 - Blood borne infections: HCV, HBV, HIV
 - Bacterial/fungal infections, IE
 - Overdose
 - Vascular injury/sclerosis



Withdrawal?

- Catecholamine depletion (drug-discontinuation syndrome)
 - Not life threatening
 - Often two phases:
 1. “crash” (1-3 days)
 2. Protracted symptoms (1-2 weeks)
 - May not start medications (ie antidepressants)
 - Focus on engagement
 - Treatment: time and supportive care

Treatment

Pharmacotherapies

- No FDA approved treatments
- Minimal/insufficient evidence to suggest any pharmacotherapy...

But...

	Cocaine	Methamphetamine	Notes
Topiramate	++	++	↑ abstinence
Naltrexone		+++	↓ use - If not on MOUD; PO or IM
Bupropion	+/-	+/-	↑ abstinence
*Psychostimulants		+/-	↓ use and cravings
Mirtazapine		+	↓ use, ↓ high risk sexual behavior
Disulfiram	+		↓ use, ↓ dropout, M>F?

Not included: baclofen, antipsychotics, gabapentin, other antidepressants

****Psychostimulants:*** mainly long-acting formulations (Adderall XR, lisdexamphetamine) but also methylphenidate, dextro/levoamphetamine, amodafinil

How to Approach Pharmacotherapy

Other substance use

- Opioid use or on agonist therapy
- Problematic alcohol use
- High risk sexual behavior
- Other sedative-hypnotics

Psychiatric co-morbidities

- Depression
- Bipolar and psychotic disorder
- ADHD
- Insomnia

Pharmacotherapy: Other Substance Use

- Opioid use disorder or on agonist therapy
 1. Buprenorphine (+/- topiramate)
 2. Other MOUD
- Problematic alcohol use
 1. Naltrexone (+/- bupropion)
 2. Topiramate
 3. Disulfiram
- High-risk sexual behavior
 - Mirtazapine
- Other sedative-hypnotics

Pharmacotherapy: Psychiatric Co-morbidities

- Depression
 - Mirtazapine
 - Other antidepressants
- Bipolar or psychotic disorder
 - Close supervision, at high risk for decompensation
- ADHD
 - Consider low-dose, long-acting stimulant
- Insomnia
 - Gabapentin
 - Mirtazapine

Psychosocial Behavioral Treatments

- Contingency management (CM)
 - Monetary incentives/prizes for participation in treatment activities, reduction in use, or abstinence
- Community Reinforcement Approach (CRA)
 - Identify reinforcing behaviors for use → impress upon user that stimulant-free lifestyle more rewarding
 - Requires long duration of therapy
- **Any intervention or interpersonal/dynamic therapy is better than no intervention!**

Other Risk Management (Harm Reduction)

- Social services connection
- Facilitate access to safer materials
 - Syringe service program
 - Supervised consumption spaces
- Wellbeing messaging
 - Importance of nutrition, hydration, sleep
 - Take breaks in use
 - Safer sex (condoms, PrEP)

Take home points

- Stimulant intoxication in the clinic can be treated with re-direction, stimuli reduction, and sometimes antipsychotics (olanzapine)
- Minimal/insufficient evidence to suggest pharmacotherapy for SUD
 - Consider naltrexone or topiramate
- Strongly encourage risk management and psychotherapy

Questions?: cpueringer@gmail.com

References

- NIDA. 2021, August 3. Overview. Retrieved from <https://nida.nih.gov/publications/research-reports/methamphetamine/overview> on 2022, May 2
- Section IAV, Prevention IAV. Indicator Dashboards Opioid Dashboard - Minnesota Department of Health. Published online December 27, 2019. Accessed May 2, 2022. <https://www.health.state.mn.us/communities/opioids/opioid-dashboard/index.html>
- Miller, Shannon. The ASAM Principles of Addiction Medicine. Wolters Kluwer Health. Kindle Edition.
- Baselt RC. Disposition of Toxic Drugs and Chemicals in Man. 7th ed. Foster City: Chemical Toxicology Institute, 2004.
- Nelson, Lewis S.,Hoffman, Robert S.,Howland, Mary Ann,Lewin, Neal A.,Goldfrank, Lewis R.. Goldfrank's Toxicologic Emergencies, Eleventh Edition McGraw-Hill Education.
- Jones CM, Compton WM, Mustaquim D. Patterns and Characteristics of Methamphetamine Use Among Adults - United States, 2015-2018. *MMWR Morb Mortal Wkly Rep.* 2020;69(12):317-323.
- Chan B, Kondo K, Ayers C, et al. Pharmacotherapy for Stimulant Use Disorders: A Systematic Review. Department of Veterans Affairs (US), Washington (DC); 2018. PMID: 30715830.
- Han B, Compton WM, Jones CM, Einstein EB, Volkow ND. Methamphetamine Use, Methamphetamine Use Disorder, and Associated Overdose Deaths Among US Adults. *JAMA Psychiatry.* 2021;78(12):1329-1342.
- Colfax G, Shoptaw S. The methamphetamine epidemic: implications for HIV prevention and treatment. *Curr HIV/AIDS Rep.* 2005;2(4):194-9. <https://doi.org/10.1007/s11904-005-0016-4>.
- U.S. Department of Justice DEA, Diversion Control Division. National Forensic Laboratory Information System (NFLIS) 2015 Annual Report. 2016.
- Miller CL, Kerr T, Fischer B, et al. Methamphetamine injection independently predicts hepatitis C infection among street-involved youth in a Canadian setting. *J Adolesc Health.* 2009;44(3):302-4. <https://doi.org/10.1016/j.jadohealth.2008.08.007>.