



Methamphetamine Use Disorder

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Disclosures

- **Speaker:** Jessica Gregg and Ximena Levander have nothing to disclose

Objectives:

1. Review the scope of the problem
2. Discuss two evidence-based behavioral interventions that can be implemented in the primary care : contingency management and harm reduction
3. Discuss research (past and present) on medications to treat methamphetamine use disorder

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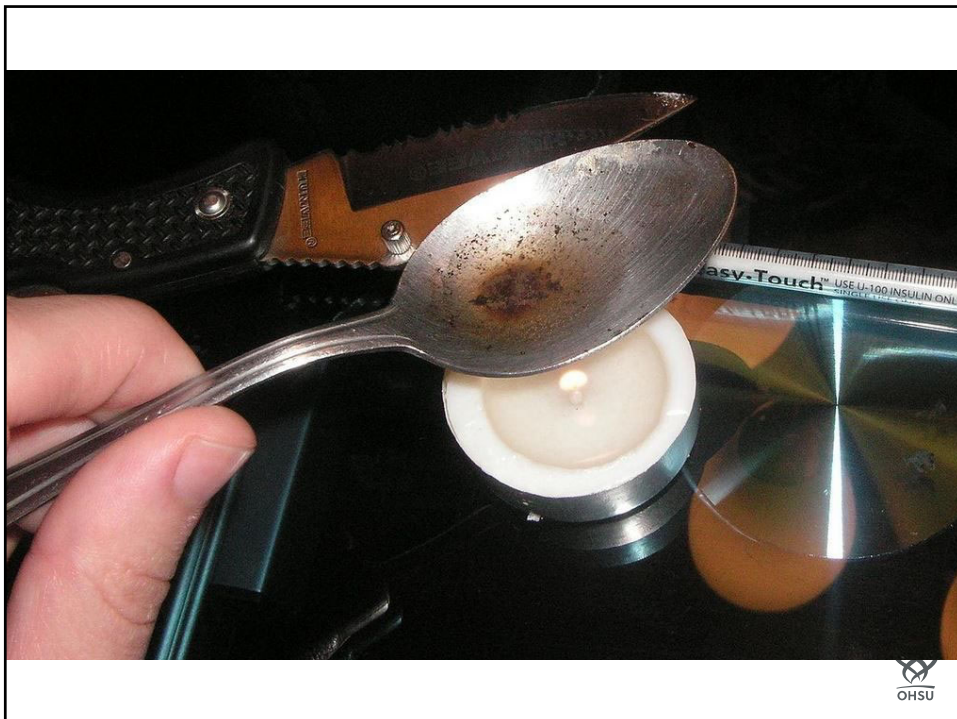


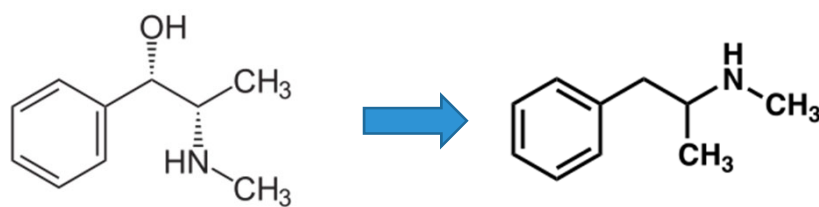
Crystal methamphetamine

- Form of d-methamphetamine
- Closely related to amphetamine
- Longer lasting and more toxic to the CNS



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Materials:

- 1 2 Liter Bottle (with cap)
- 1 1 Liter Bottle (get 2 caps for it)
- 1 20 oz. Bottle (with cap)
- 1 Quart Jar
- 2 ft. 1/4in. diameter rubber/plastic hose (aquarium hose works good)
- Coffee Filters
- 1 Funnel
- 1 Tubing Cutter (go to Home Depot)
- 2 Pliers
- 1 Roll of Ductape or Electrical Tape 1 Blender or Food Processor

- 200 60mg Pseudophedrine HCL pills (Actifed, Sudafed, Suphedrine, etc.)
- 1 1/2 cups Ammonium Nitrate fertilizer (33-0-0)
- 3 cans starting fluid
- 3 AA Energizer Lithuim Batteries
- 1 bottle Red Devil brand Lye
- 2 caps of water (use the top off the 2 liter)
- 1 box Iodized Salt
- 1 bottle Liquid Fire brand drain opener

Procedure:

- 1) Rinse and dry out all of your bottles. Be sure to get ALL of the moisture out. Don't go any further until they are completely dry.
- 2) Put your pills into the blender or food processor and grind them into powder. Mix them in with the 1 1/2 cups of Ammonium Nitrate fertilizer. Use the funnel to pour the mixture into the 2 liter



2005: CMEA (Combat Methamphetamine Epidemic Act)



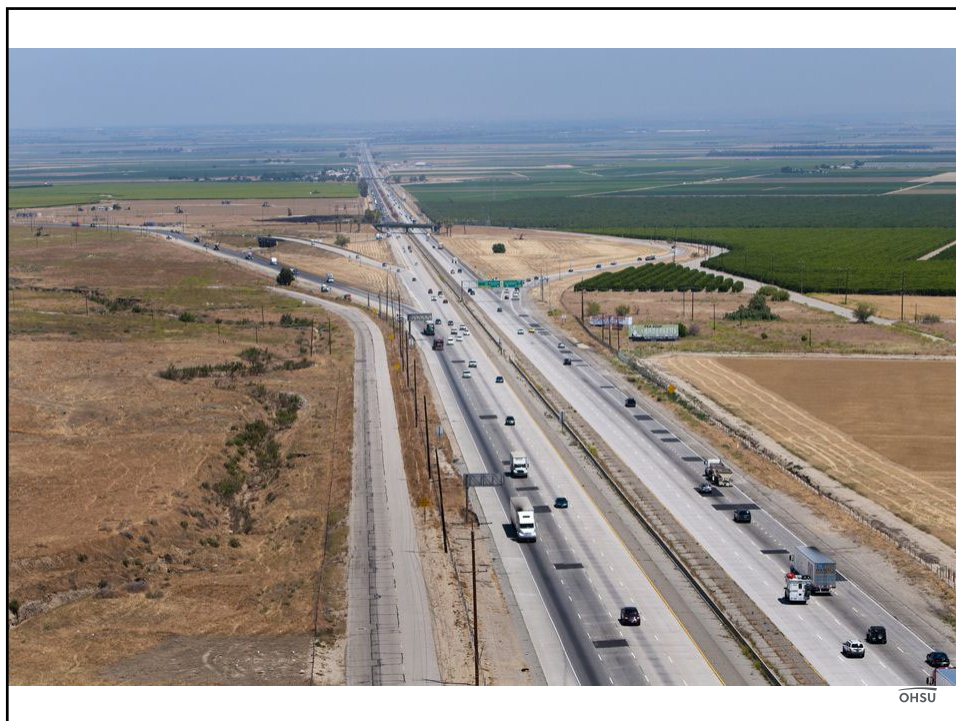
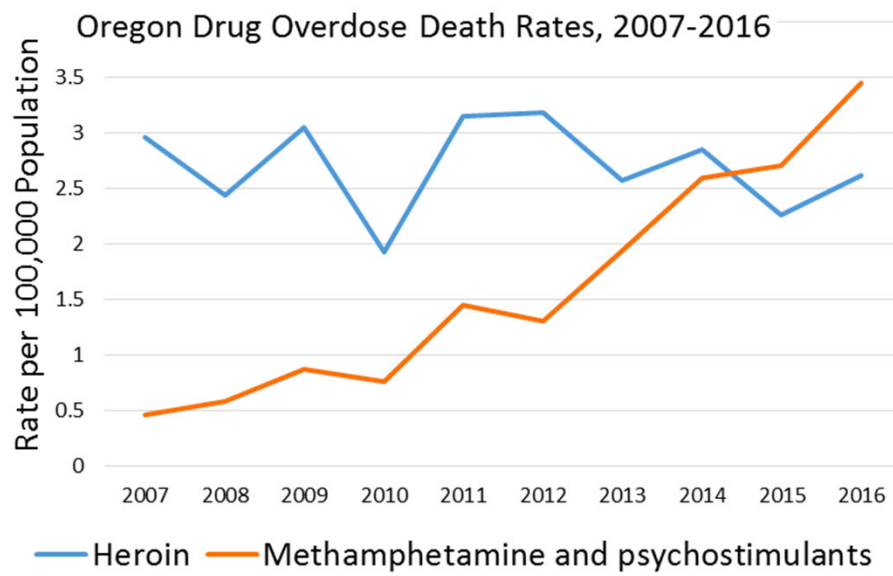
Result?

In Oregon, from 2004 to 2011, methamphetamine lab incidents decreased from an average of 24 per month to less than one per month

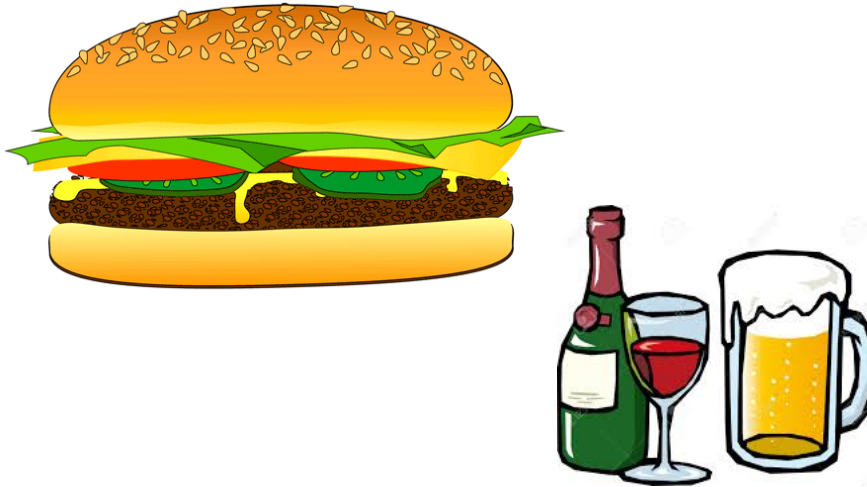
<http://www.oregondec.org/pse.htm>



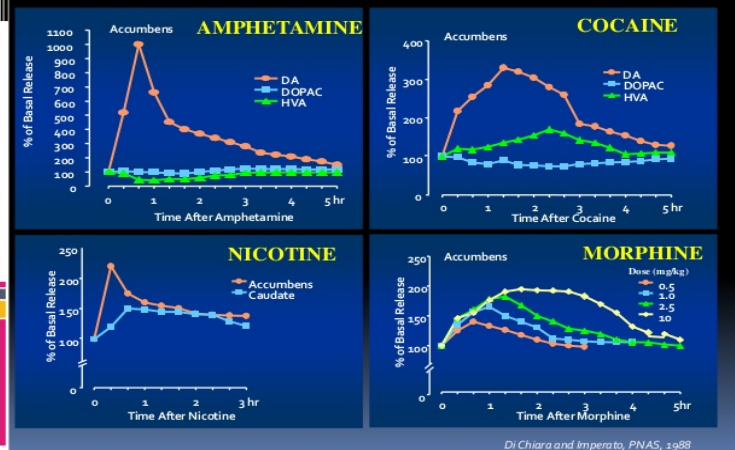
And Yet...



Increase dopamine to +/- 200 times basal output



Effects of Drugs on Dopamine Release



Di Chiara and Imperato, 1988



Medical Effects (not exhaustive)

- MA-induced sympathetic nervous system stimulation
 - Tachycardia, hypertension, arrhythmia, aortic dissection, anxiety, psychosis
- Organ pathology from excess circulating catecholamines
 - cardiotoxicity
- Direct toxicity to tissues
 - cardiotoxicity
- Chemical and street drug contaminants
 - Opioid overdose
- General health consequences of drug-using
 - Delayed health care seeking
- Lifestyles (needle sharing, malnutrition)
 - Abscesses, HIV, hep C



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Contingency Management



Photo courtesy of John Mahan MD
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Contingency Management: Theory

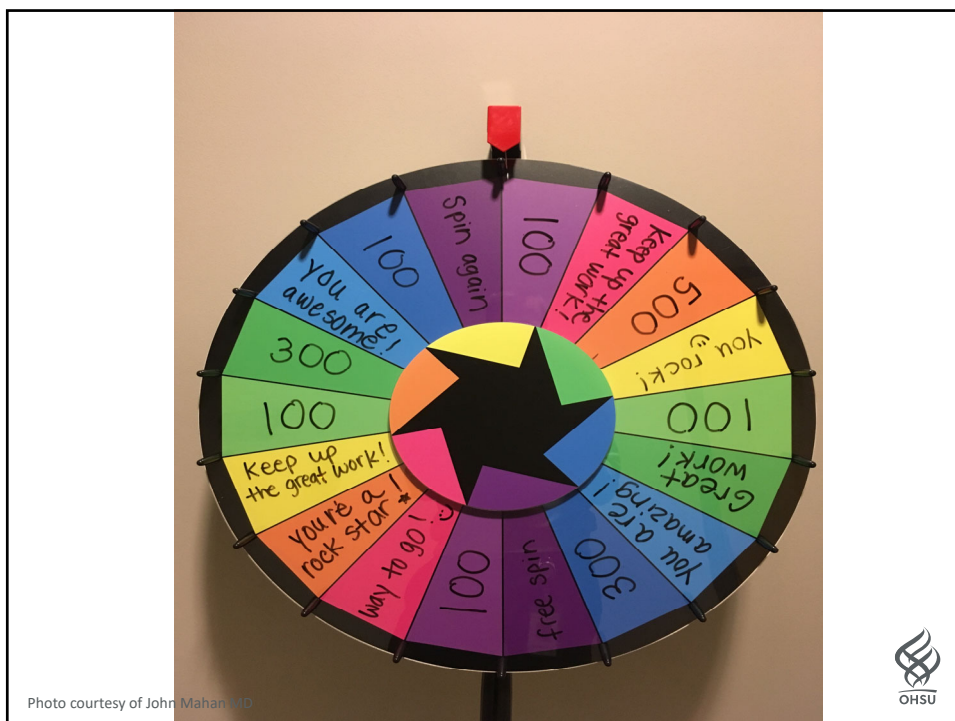
- Addiction is sustained through reinforced learning
- We cannot simply unlearn habits – we must learn new and competing habits
- CM entrains new behaviors that support the process of recovery
- Breaks recovery process down into a series of concrete, attainable goals
- > 100 RCTs affirm the effectiveness of CM in treating addiction

Roll JM et al. Am Jnl Psych 2006
Roll JM et al. Addict Behav 2013
Rawson, RA et al. Addiction 2016



Contingency Management: Practice

1. Identify a target behavior that can be objectively measured, attainable, and reinforced in real time.
2. Reward that behavior immediately when it occurs, using rewards that are valuable to participants (but not necessarily expensive).
3. Use an escalating schedule of reinforcement.



Example

Patient who is stable on buprenorphine and no longer uses heroin but continues to use methamphetamine weekly. She likes chocolate and Starbucks Frappuccinos

Target behavior: decreased methamphetamine use, as measured by urine drug screen

Reward: Hershey's kiss each time the UDS is negative for methamphetamines

Escalating schedule: \$5 Starbucks card after she has accumulated 10 Hershey's kisses

Center for Substance Abuse Treatment. *Substance Abuse: Clinical Issues in Intensive Outpatient Treatment*. Treatment Improvement Protocol (TIP) Series 47.



Harm Reduction

A set of practical strategies and ideas aimed at reducing negative consequences associated with drug use. Harm Reduction is also a movement for social justice built on a belief in, and respect for, the rights of people who use drugs.

Harm reduction coalition <https://harmreduction.org/about-us/principles-of-harm-reduction/>



Harm reduction is also

- Part of the continuum of care
- Relationship building
- Treatment



Harm reduction is not

- What we do when nothing else works



Harm reduction practices: methamphetamines

1. Safe injecting:

- Clean needles/rigs (including don't share filters, cookers)
- Don't use alone
- Use needles bevel up
- Use a filter whenever possible
- Test for fentanyl
- Clean water

Collins S et al. *Int'l Jnl of Drug Policy* 2019
Thakarak K, Weinstein ZM, Walley AY. *Postgrad Med J.* 2016;92(1088):356–363.



Harm reduction practices: methamphetamines

2. Hydration

3. Toothbrushes

4. Condoms

5. Naloxone

6. **Patient Centered:** Ask the patient/client: what harms most concern you?

Collins S et al. *Int'l Jnl of Drug Policy* 2019
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MAT for Methamphetamine Use Disorder

- No FDA-approved treatment for MA use disorder
- Lots of research looking into possible treatments, ongoing clinical trials.

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Atomoxetine

- Selective Norepinephrine Transporter Inhibitor
- Approved for ADHD
- Small pilot RCT in Malaysian men w/ combo opiate & amphetamine use disorders
- Suboxone + randomized to placebo or Atomoxetine 40mg/day x 7days then 80mg/day.
- Small effect size for neg UDS compared to placebo (moderate effect size in high adherence group)
- Similar proportion of reported days abstinent

Schottenfeld RS et al. Drug Alcohol Depend 2018

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Topiramate

- Anticonvulsant, migraine (prevention)
- Mechanism of Action for Stimulants:
 - Binds to GABA receptor – increasing GABA
 - Inhibiting glutamate activity
- Placebo-controlled, double-blind, randomized multi-center trial of 140 U.S. adults with MA UD
- Titrated up to 200mg/day
- Did not decrease abstinence (UDS results)
- Did reduce amount used & relapse rates in abstinent adults

Elkashef A et al. Addiction 2012

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Psychostimulants

- Dextroamphetamine (narcolepsy), methylphenidate (ADHD, narcolepsy), modafinil (narcolepsy, shift work sleep disorder)
- Dopamine agonists
- All have abuse/dependency potential
- Systematic review of 17 studies found no effect for sustained abstinence or treatment retention.
- 2 methylphenidate RCTs had low strength evidence of reduced use during the trial

Bhatt M et al. Systematic Review 2016

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Meds with no effect/insufficient evidence

- Varenicline
- Antipsychotics – aripiprazole (could increase harm)
- Antidepressants – bupropion, mirtazapine, sertraline
- Anticonvulsants

Briones M et al. Drug Alcohol Depend 2018

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In the pipeline??

- Lots of interest for treatments for MA use disorder
- Bupropion 450 daily + Naltrexone IM every 3 weeks (no longer enrolling, completing data collection)
- Monoclonal antibody (study currently enrolling)
- Transcranial Magnetic Stimulation



Summary

- Methamphetamine use and use disorders are escalating in Oregon
- There are effective behavioral interventions
- Harm reduction is treatment
- Medications are being investigated.





Thank You



Questions?

