



# TBI-BH ECHO

Traumatic Brain Injury - Behavioral Health ECHO  
UW Medicine | Psychiatry and Behavioral Sciences

# Stimulant Use Disorders

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# Speaker disclosures

- ✓ Any conflicts of interest?
  - ✓ None

The following series planners have no conflicts of interest:

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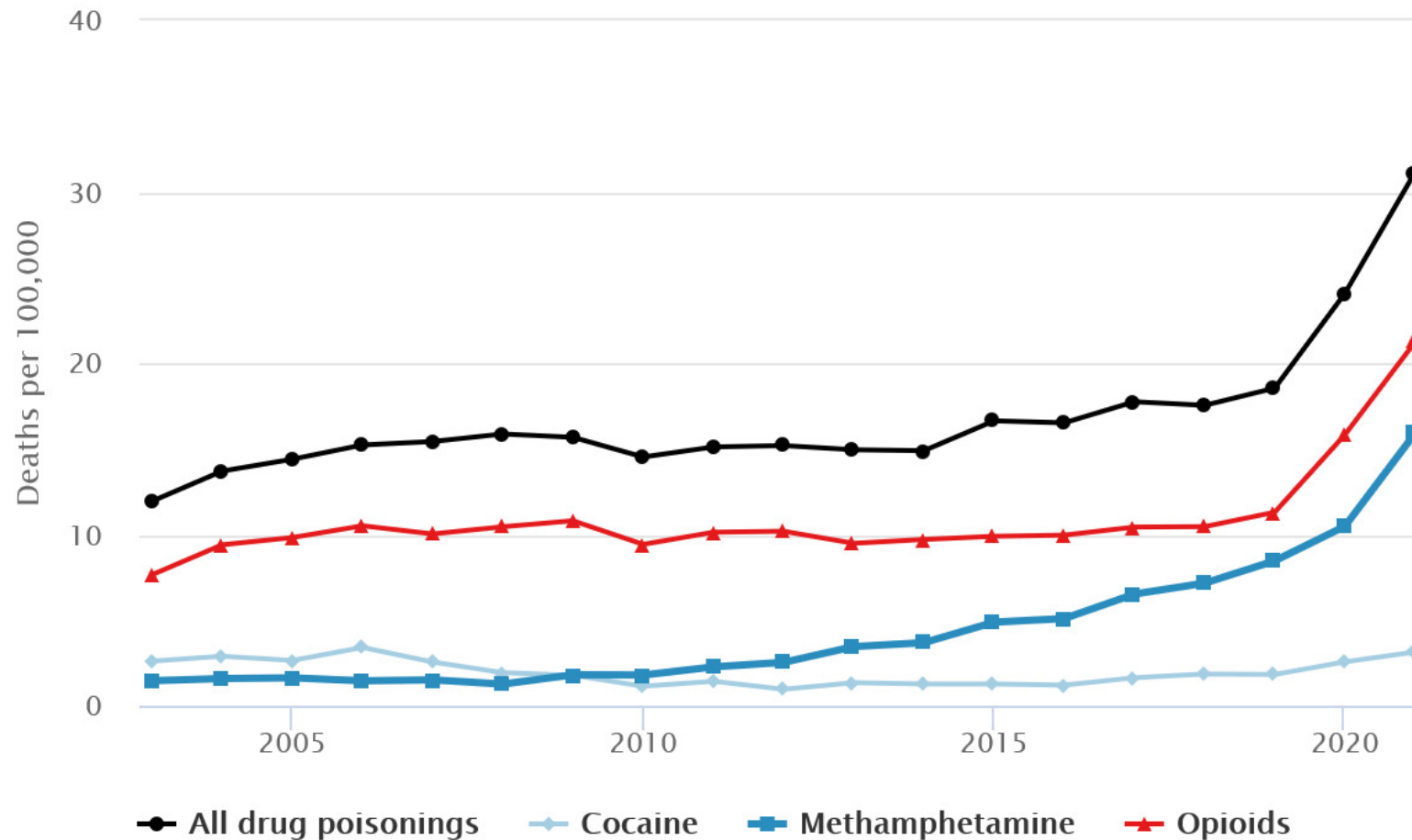
# Objectives

1. Describe current trends of methamphetamine use in the state of Washington
2. Highlight the clinical impact of methamphetamine use
3. Increase knowledge on how to approach stimulant use disorder



# Methamphetamine in WA: ↑ Deaths

Drug-caused death rates per 100,000 state residents

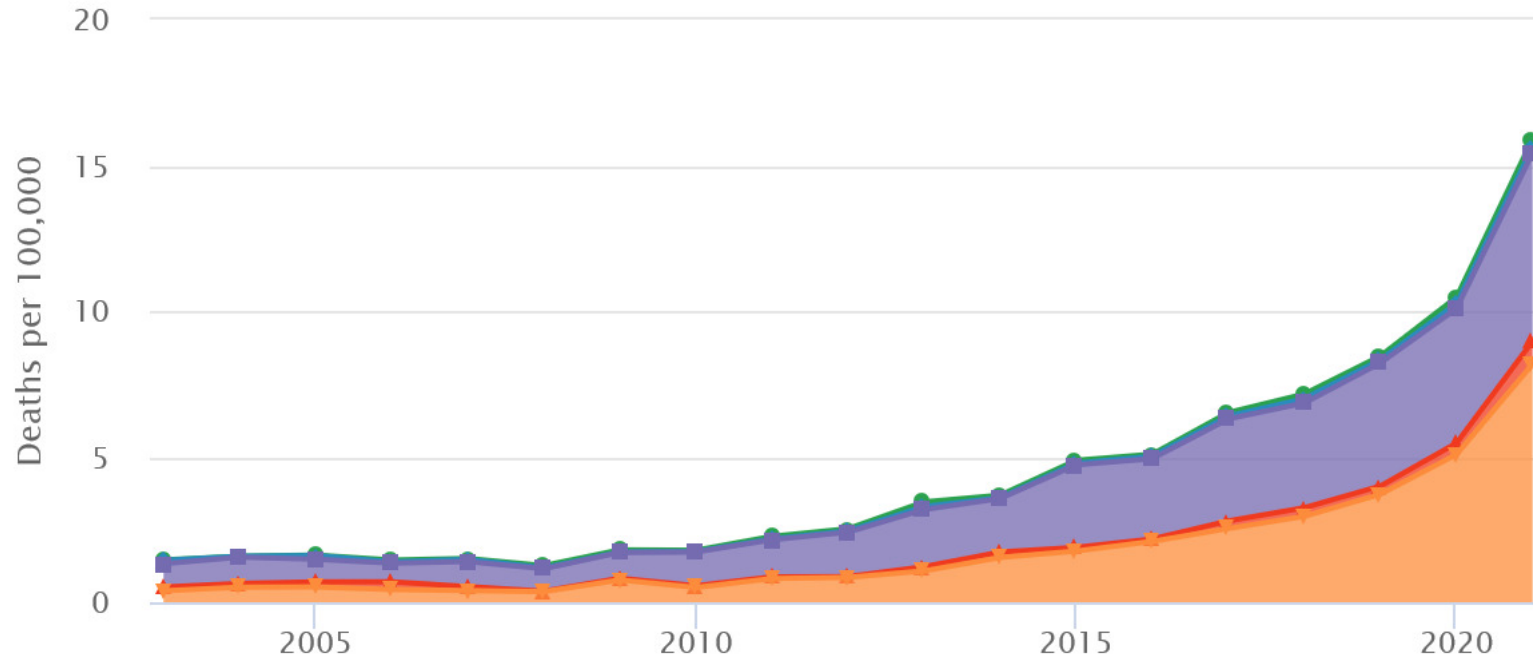


Analysis by UW ADAI. For data sources, see text or [adai.uw.edu/WAdata](http://adai.uw.edu/WAdata)



# Methamphetamine in WA: often mixed with other drugs

Death rates per 100,000 state residents, methamphetamine deaths detail



- Methamphetamine & Alcohol or Benzos or Barbiturates (no C or O)
- Methamphetamine & Cocaine
- Methamphetamine (no C or O or ABB)
- Opioids & Cocaine & Methamphetamine
- Opioids & Methamphetamine

Analysis by UW ADAI. For data sources, see text or [adai.uw.edu/WAdata](http://adai.uw.edu/WAdata)

## Meth

- 6.46 deaths per 100,000
- 23% of all drug poisoning

\*Opioids 10.79 (37% of all drug poisoning)

## Opioids and Meth

- 8.18 deaths per 100,000
- 27% of all drug poisoning

\*Opioids 10.79 (37% of all drug poisoning)



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# Helpful Things to Know about Meth

- ▶ How is it used: smoking, swallowing, snorting, injecting
- ▶ Binge pattern
  - ▶ Functional
  - ▶ Pleasurable
- ▶ Detectable in urine drug tests: 1-4 days

Short-Term Effects	Long-Term Effects
Increased wakefulness Decreased appetite Increased breathing rate Increased heart rate Increase blood pressure Increase body temperature	Extreme weight loss Addiction Severe dental problems Intense itching, leading to skin sores from scratching Anxiety Changes in brain structure and function Confusion Memory loss Sleeping problems Violent behavior <i>Paranoia</i> —extreme and unreasonable distrust of others <i>Hallucinations</i> —sensations and images that seem real though they aren't

NIDA. 2019, May 16. Methamphetamine DrugFacts. Retrieved from <https://nida.nih.gov/publications/drugfacts/methamphetamine> on 2022, October 7

Peavy KM, Banta-Green C, Owens M. Opioids and Stimulants: What Are They and How Are People Using Them? Seattle, WA: Addictions, Drug & Alcohol Institute, University of Washington, April 2021.



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# Impact of TBI and Chronic Meth Use on Brain are similar

- ▶ Structural: both are linked with reduction in hippocampal vol and damage to prefrontal cortex, limbic, and paralimbic cortices
- ▶ Biochemical: imbalance in excitatory and inhibitory homeostasis
- ▶ Cellular: inflammation and apoptosis

When combined → increase in neuronal damage?



27yo M with a history of bacterial meningitis in college presenting for a STI check/treatment after having sex with multiple sexual partners during a binge on methamphetamine. He is using a 2 days a week he admits he should stop using.

What would you do?

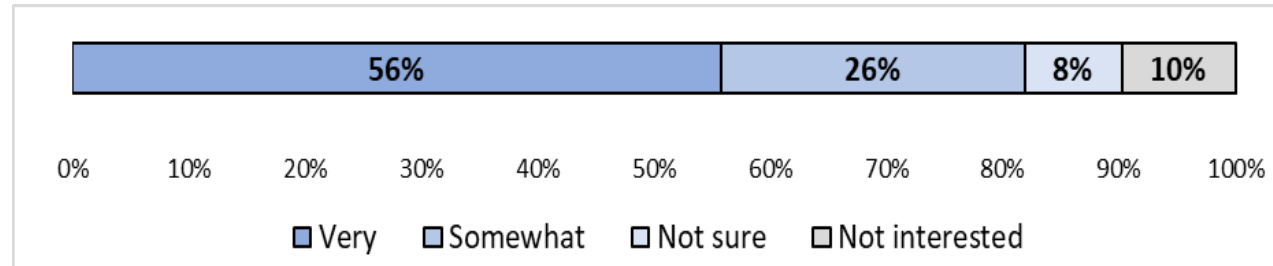
- A. Refer to a residential addiction treatment facility
- B. Refer to an outpatient addiction treatment facility
- C. Start a medication to treat his methamphetamine use disorder
- D. Monitor use → not a use disorder
- E. Other



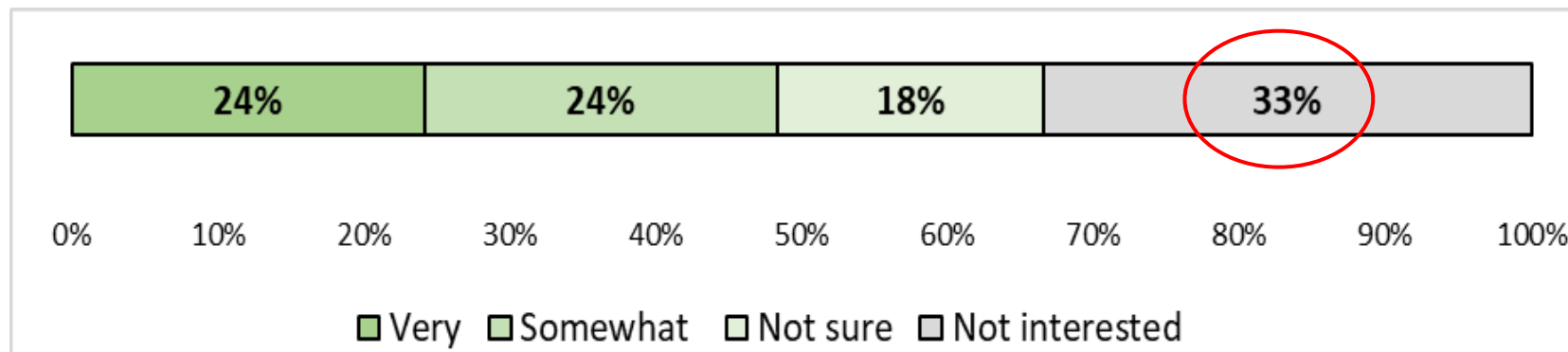


# Interest in Reducing Use? (Meth is Very Reinforcing)

Interest in reducing or stopping *opioid* use among main drug heroin n=514



Interest in reducing or stopping *stimulant* use among main drug meth, n=281



# Everyone has their own clock for change

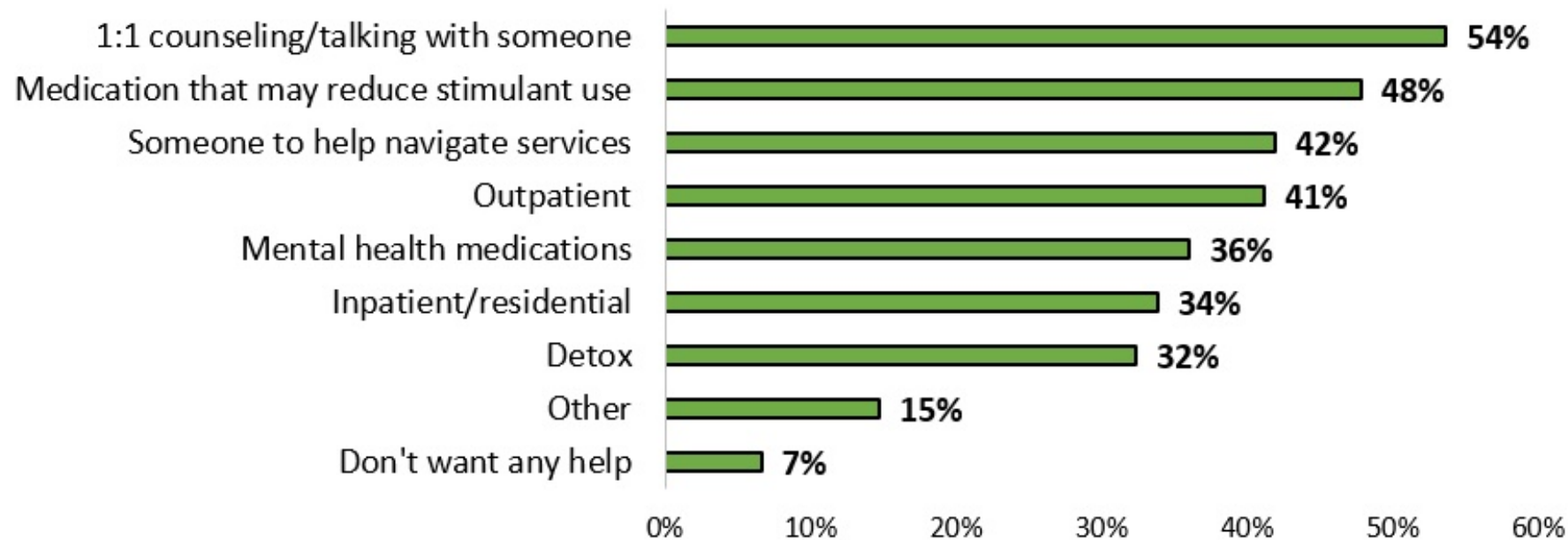
- ▶ Temper Provider Expectations
- ▶ Remembering the good news: opioid/stimulants users enrolled in opioid treatment are enrolled in treatment.
  - ▶ Keep them there. Avoid discharge for stimulant use.
- ▶ Continue exploring reasons to change.
- ▶ Leverage long lasting and important counseling relationships to explore change.



# Meth - Services Requested

What types of help would you want if they were easy to get?"

n=136 among main drug meth, past week meth use, & somewhat/very interested in reducing stimulant use



ADAI Statewide Syringe Survey data



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# Meth - Services Requested

What types of help would you want if they were easy to get?”

n=136 among main drug meth, past week meth use, & somewhat/very interested in reducing stimulant use

**Takeaway: Offer a range of services**

Counseling  
Care Navigation  
Mental Health Treatment  
Medications  
Medical Treatment?





## Safer-use Strategies: Uppers/Stimulants

Stimulants are “uppers” and include cocaine, crack, meth, MDMA (Molly) and bath salts, as well as prescribed drugs like Ritalin and Adderall. Here are some tips to help you stay safer and healthier no matter how you choose to change your use. Using more safely does not mean that you remove all risks, including death, but it can help you reduce your drug-related harm. You are worth it!

Ways to stay healthier when you use	Prepare for safer sex	<ul style="list-style-type: none"><li>• <b>Why?</b> Stimulant use can lower your inhibitions and turn up your sex drive.</li><li>• <b>How?</b> It's a good idea to think ahead and carry condoms, dams, lube and gloves with you. These barriers can prevent unwanted pregnancy and sexually transmitted infections like HIV and hepatitis C.</li></ul>
	Test your drugs	<ul style="list-style-type: none"><li>• <b>Why?</b> You can find out if your drugs are cut with other drugs (like fentanyl) or fillers (like levamisole) that could harm you.</li><li>• <b>How?</b> Talk to providers about getting a urine drug testing kit and testing liquids before you shoot them. For pills and powders, check out <a href="https://dancesafe.org">https://dancesafe.org</a> for testing kits.</li></ul>
	Try to eat	<ul style="list-style-type: none"><li>• <b>Why?</b> Stimulants can drain your body and dull your appetite. Food and water replenish these important nutrients to help you stay healthy.</li><li>• <b>How?</b> Try to eat nutritious foods before using, pack healthy snacks and water on the go, and avoid using over a long time. Let your body rest for at least a day after using.</li></ul>
	Take care of your mouth	<ul style="list-style-type: none"><li>• <b>Why?</b> Some stimulants cause mouth dryness, sores, cracks, and teeth clenching.</li><li>• <b>How?</b> Drink water to keep yourself hydrated, and chew gum to keep your mouth moist and your teeth from grinding. Brushing your teeth can help control increased bacteria due to dry mouth. Use chapstick to prevent lip and mouth cracking.</li></ul>
Ways to use more safely	Choose safer ways to use	<ul style="list-style-type: none"><li>• <b>Why?</b> Some ways of using drugs are less risky to your health.</li><li>• <b>How?</b> Taking drugs by mouth is safer than smoking which is safer than shooting. If you smoke crack, you can use a crack condom for your pipe. You can get clean works at the People's Harm Reduction Alliance or the King County Needle Exchange.</li></ul>
	Shoot safer	<ul style="list-style-type: none"><li>• <b>Why?</b> Avoid overdose, bloodborne illness (HIV and hepatitis C), bacterial infections.</li><li>• <b>How?</b> Pace yourself until you know the strength of your stash. Shooting into veins in your arms or hands is safer than hitting blind into your groin or into your neck. Rotate sites and shoot downstream if possible. Using new, clean needles and works can help prevent bloodborne illnesses, like HIV and hepatitis C, and other infections.</li></ul>
	Avoid mixing drugs	<ul style="list-style-type: none"><li>• <b>Why?</b> Using stimulants and depressants, like opioids, alcohol or benzos, at the same time can have unexpected effects, put stress on your heart and lead to overdose.</li><li>• <b>How?</b> Try to stick to one drug at a time, especially when you are unsure of its strength or content.</li></ul>
	Use with safe people in a safe place	<ul style="list-style-type: none"><li>• <b>Why?</b> Heavy stimulant use can cause paranoia or aggression that can lead to fights, hassles and arrests. People can take advantage of you when you're high.</li><li>• <b>How?</b> Avoid using with people you don't know or trust. Use where you feel safe and in control of the surroundings. Do not drive or ride your bike when you are high.</li></ul>
Ways to change how much you use	Less is more	<ul style="list-style-type: none"><li>• <b>Why?</b> You can avoid overdosing or experiencing drugs' toxic effects.</li><li>• <b>How?</b> You can decide how you want to limit your use. You could choose to buy only a certain amount or set a spending limit. Leave the rest of your money at home or in a safe place. You might ask a trusted friend to remind you of your limit.</li></ul>
	Choose not to use	<ul style="list-style-type: none"><li>• <b>Why?</b> Not using—even for a few hours or days—gives your body a rest and may help you to avoid your body or mind becoming dependent on stimulants.</li><li>• <b>How?</b> Try a few hours of not using or introducing some nonuse days every week. Check in with a provider if you want to stop altogether.</li></ul>
	Talk to a provider about withdrawal	<ul style="list-style-type: none"><li>• <b>Why?</b> Only alcohol and benzo withdrawal, which causes the shakes, seizures or DTs—can be deadly. However, other drugs may have uncomfortable withdrawal symptoms.</li><li>• <b>How?</b> Ask your provider if you are worried about withdrawal or if you have HIV or are pregnant. They may be able to help with some of the symptoms.</li></ul>

For more information, contact the Harm Reduction Research and Treatment Center at 1 (855) 320-1004 or at [harrtlab@uw.edu](mailto:harrtlab@uw.edu).



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# Treatment Options

- ▶ **1<sup>st</sup> Line-Psychosocial Support**
  - ▶ More consistent effect on
    - ▶ Reducing stimulant use
    - ▶ Longer periods of abstinence
    - ▶ Effects may last longer or can be more durable
- ▶ **2<sup>nd</sup> Line-Pharmacotherapy**
  - ▶ Less consistent effects on
    - ▶ Reducing use or supporting abstinence



# Treatment Options

## ▶ 1<sup>st</sup> Line-Psychosocial Support

### ▶ Contingency Management

- ▶ Significant results: OUD + Cocaine → CM resulted in a 41% increase in abstinence
- ▶ Effects do not stick around



Also available

- ▶ CBT
- ▶ 12 Step Groups



# Contingency Management

- ▶ Targets specific behaviors
  - ▶ Attendance
  - ▶ Taking medication
  - ▶ Substance use
- ▶ Provides the person with an incentive for doing the target behavior.
- ▶ Allows for a celebration when target behavior is complete.
- ▶ App-based delivery?





24yo F with a history of possible ADHD in an intensive outpatient treatment program. Methamphetamine use continues to be used mostly around her work earning money delivering food all night.

**What medication might you offer?**

- A. Bupropion
- B. Mirtazapine
- C. Methylphenidate
- D. Lisdexamfetamine
- E. None



# Treatment Options

- ▶ Medications for stimulant use disorder
  - ▶ No FDA approved medication
  - ▶ Many have been tried, participant dropouts common
    - ▶ Antidepressants
    - ▶ Antipsychotics
    - ▶ Stimulants
    - ▶ Anticonvulsants
    - ▶ Other SUD meds



# Summary of Meds for Methamphetamine Use Disorder

	Abstinence	Use	Retention	Harms
<b>All Antidepressants</b>	★★	∅	★★	★
<b>Aminoketone:</b> Bupropion	★	★	★★	∅
<b>Atypical Antidepressant:</b> Mirtazapine	NA	∅	∅	∅
<b>SSRI:</b> Sertraline	∅	NA	∅	NA
<b>Atypical Antipsychotics:</b> Aripiprazole	∅	★	∅	∅
<b>Psychostimulants and Other Medications for ADHD</b>				
<b>All Psychostimulants:</b> Modafinil, Dexamphetamine, Methylphenidate	★	∅	★	NA
Methylphenidate	NA	★	★	NA
Atomoxetine	NA	∅	∅	∅
<b>All Anticonvulsant and Muscle Relaxants:</b> Baclofen, Gabapentin, Topiramate	∅	∅	∅	∅
Topiramate	NA	★	★	★
<b>Medications used for other substance use disorders</b>				
Naltrexone	∅	★	★	★★
Varenicline	NA	∅	∅	∅

Shading represents the direction of effect:

(No color)	Unclear
Grey	No difference
Green	Evidence of benefit
Red	Favors placebo

Symbols represent the strength of the evidence:

NA	No evidence or not applicable
∅	Insufficient
★	Low
★★	Moderate
★★★	High



# Treatment Options

- ▶ Bupropion (Wellbutrin, Zyban)-2008
  - ▶ 12 weeks, 3 days in clinic (urine drug screens/assessments/90 min CBT group therapy)
  - ▶ Bupropion SR 150-300mg qday
  - ▶ Results: In MALE participants using 18 days/30days in the Bupropion arm about 70% had a week free of meth vs 40% in the placebo
- ▶ Mirtazapine (Remeron)-2019
  - ▶ 24 weeks treatment and 12 weeks follow-up, interest in reducing or stopping meth use
  - ▶ Seen weekly for meth urine testing, 30min CBT/MI session
  - ▶ Cisgender men and transgender women who have sex with men
  - ▶ Mirtazapine 30mg qhs, delivered via wise pill dispenser
  - ▶ Results: reduced high risk sex, reduced urine drug tests (RR 0.75)



# Treatment Options

## ▶ Methylphenidate

- ▶ Sample of 4 RCTs: Methylphenidate vs Placebo, max dose 54mg qday
  - ▶ Reduced amphetamine positive urine samples in 2 or 4 studies
  - ▶ Reduced cravings
  - ▶ One study showed more positive effect in more severe use at baseline

## ▶ Topiramate

- ▶ 2 RCTs, N=202, one study had a brief “compliance enhancement tx”
  - ▶ Topiramate 200mg qday vs Placebo 10-12 weeks.
  - ▶ Results from 2012-Elkashef-reduced weekly meth levels by > 25% (urine concentrations) and severity of dependence
  - ▶ Results from 2016 Rezaei-less positive urines, reduced addiction severity and cravings



# ADHD Pharmacotherapy

## Methylphenidate

- ▶ High doses (up to 180mg qday ER, FDA max 72):
- ▶ Participants: incarcerated population, men, amphetamine addicted
- ▶ Results
  - ▶ Reduced methamphetamine use
  - ▶ High drop out rate

Carpentier, P, et all, 2017



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# Vivitrol + Bupropion

- ▶ Population: Mod to Severe Meth Use Disorder
- ▶ Excluded
  - ▶ In current SUD tx
  - ▶ Expected need for opioid tx
- ▶ Intervention
  - ▶ 12 weeks
  - ▶ Vivitrol + Bupropion XL 450mg qday
  - ▶ Clinic visits 2x's/week
    - ▶ Urine samples
    - ▶ Assessments
    - ▶ Weekly clinician visits to monitor side effects, encourage abstinence
  - ▶ Smart phone app monitored Bupropion adherence

Trivedi, MH et al 2021



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# Vivitrol + Bupropion

## ▶ Results

- ▶ 16.5% of participants achieved negative drug screens by week 5 and 6
- ▶ 11.4% achieved meth negative urine drug screens by week 11 and 12.
- ▶ NNT-9
  - ▶ (NNT for Naltrexone to prevent return to any drinking for AUD is 20)



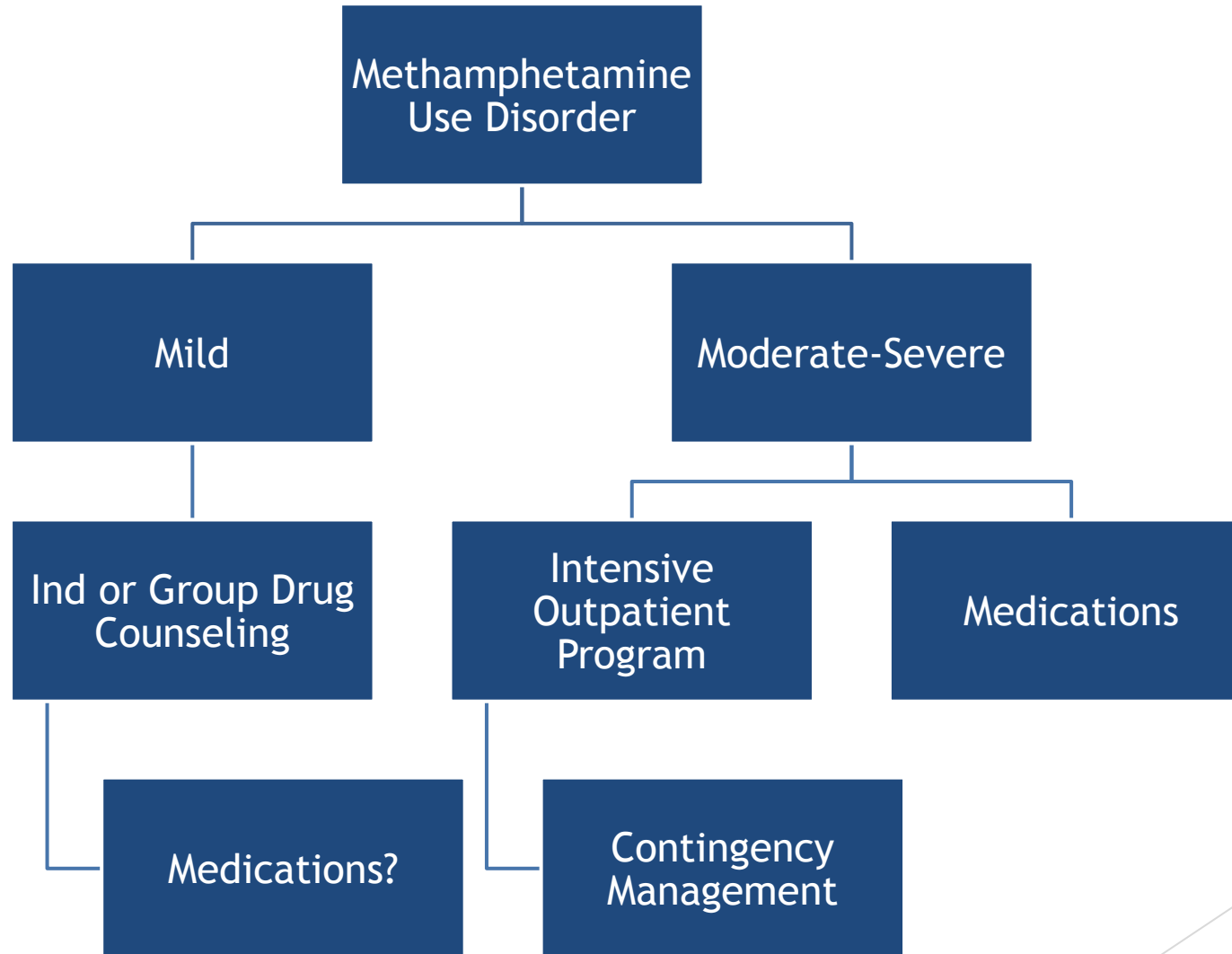


# Best Predictors of Success

- ▶ Infrequent use at start and/or early abstinence within 2 weeks
- ▶ Medication adherence
  - ▶ More likely to open pill bottles on visit days
  - ▶ Increased age
- ▶ Psychosocial participation



# Treatment Approach



# Treatment Options: Stimulants

- ▶ Goal: to keep the patient engaged and monitor use.
  - ▶ Meet patient where they are at.
  - ▶ Abstinence
  - ▶ Detox-typically not needed
  - ▶ Mutual Help Groups-CA
  - ▶ Inpatient or specialty treatment referral
  - ▶ Contingency Management is most helpful



# Books to Learn More about Methamphetamine Use Disorder

- ▶ *The Least of Us: True Tales of America and Hope in the Times of Fentanyl and Meth*
  - ▶ by Sam Quinones
- ▶ *Beautiful Boy: A Father's Journey Through His Son's Addiction*
  - ▶ by David Sheff
- ▶ *Tweak: Growing Up on Methamphetamine*
  - ▶ by Nic Sheff

