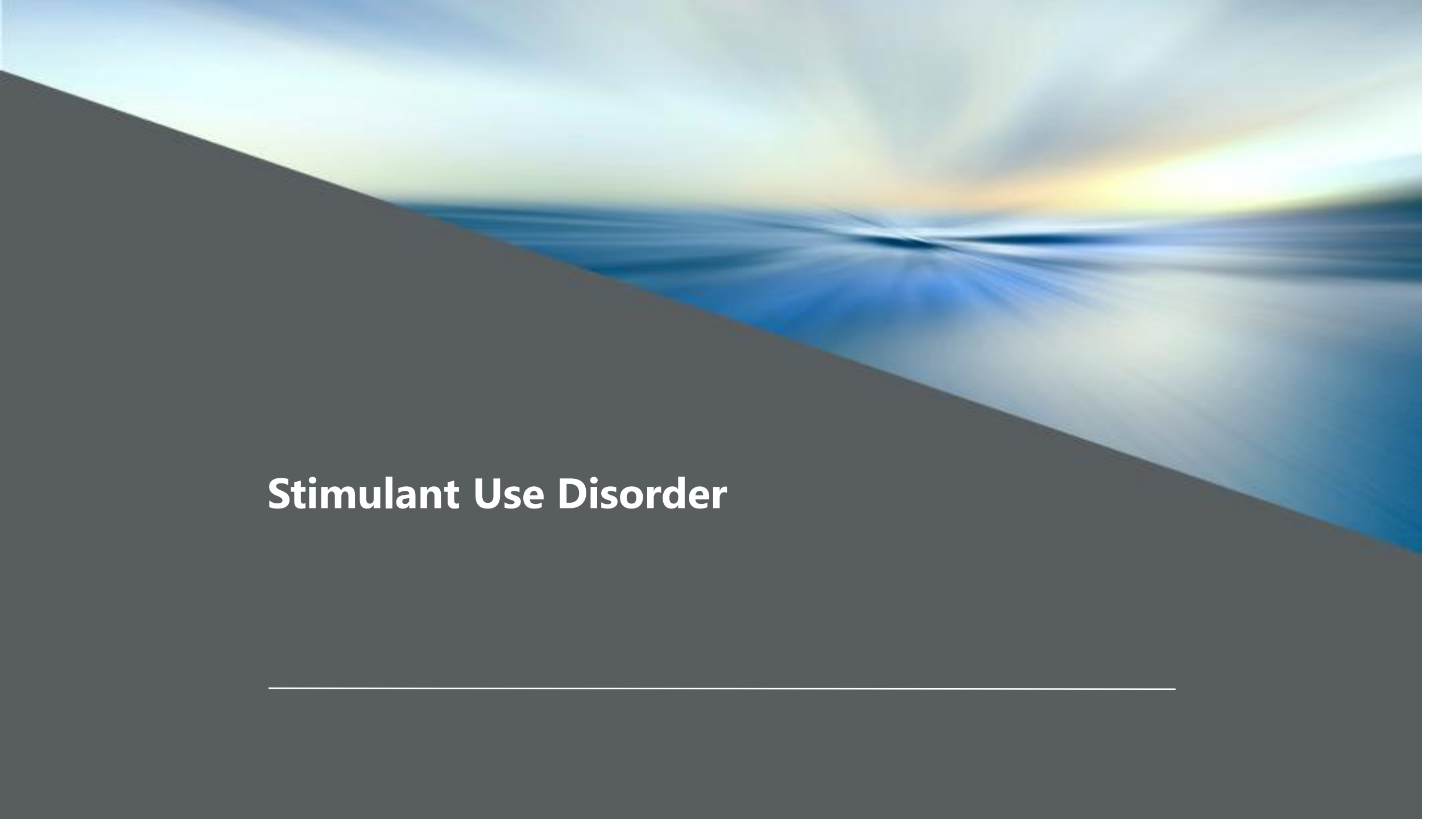




Stimulant Use Disorder

Objectives

Review	Review the scope of the problem
Discuss	Discuss the role of dopamine and dysregulation
Describe	Describe two behavioral health interventions
Discuss	Discuss research (past and present) on medications to treat methamphetamine and cocaine use disorders

The scope of the problem

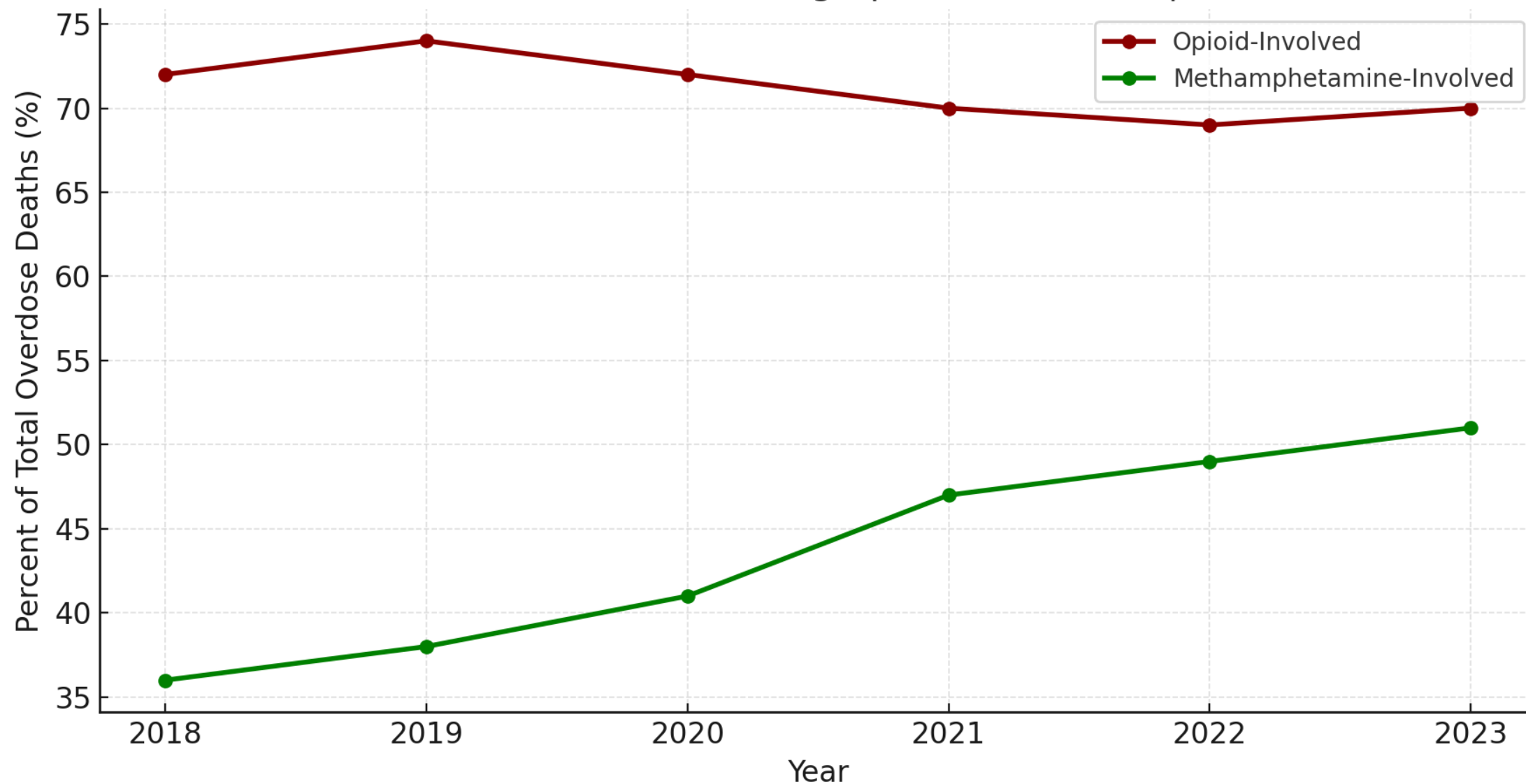
Across the U.S. from 2012- 2018:

3x increase for cocaine-related mortality

5x increase for methamphetamine-related mortality

Methamphetamines are now approaching the prevalence of opioids in overdose fatalities.

Percent of Overdose Deaths Involving Opioids vs Methamphetamine (NM)

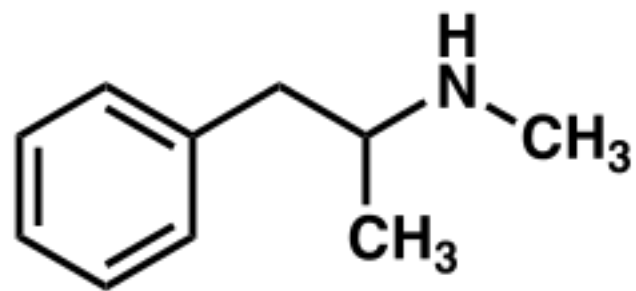
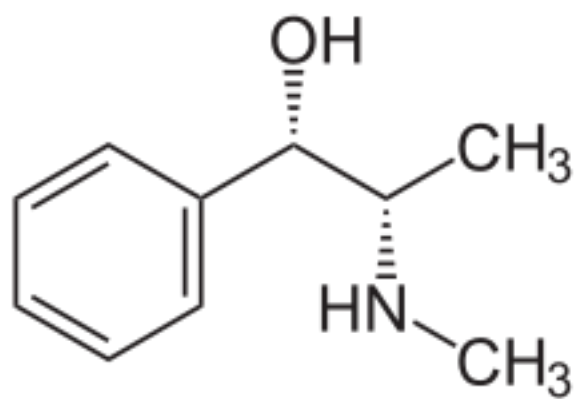


+
o •

Why?

+
• o





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 Plyers
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:

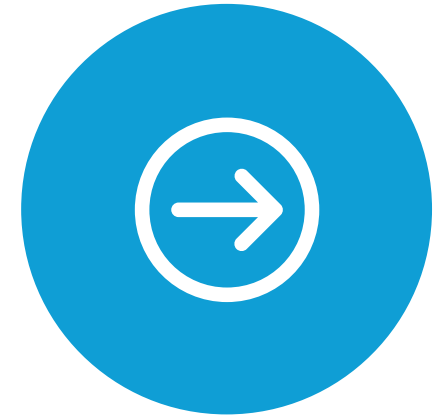
-
- 1) Rinse and dry out all of your bottles. Be sure to get ALL of the moisture out. Don't go any further until they are completely dry.
 - 2) Put your pills into the blender or food processor and grind them into powder. Mix them in with the 1 1/2 cups of Ammonium Nitrate



2003–2004: STATE AND VOLUNTARY
RETAIL RESTRICTIONS



2005: MANY STATES ENFORCE
PSEUDOEPHEDRINE CONTROL LAWS

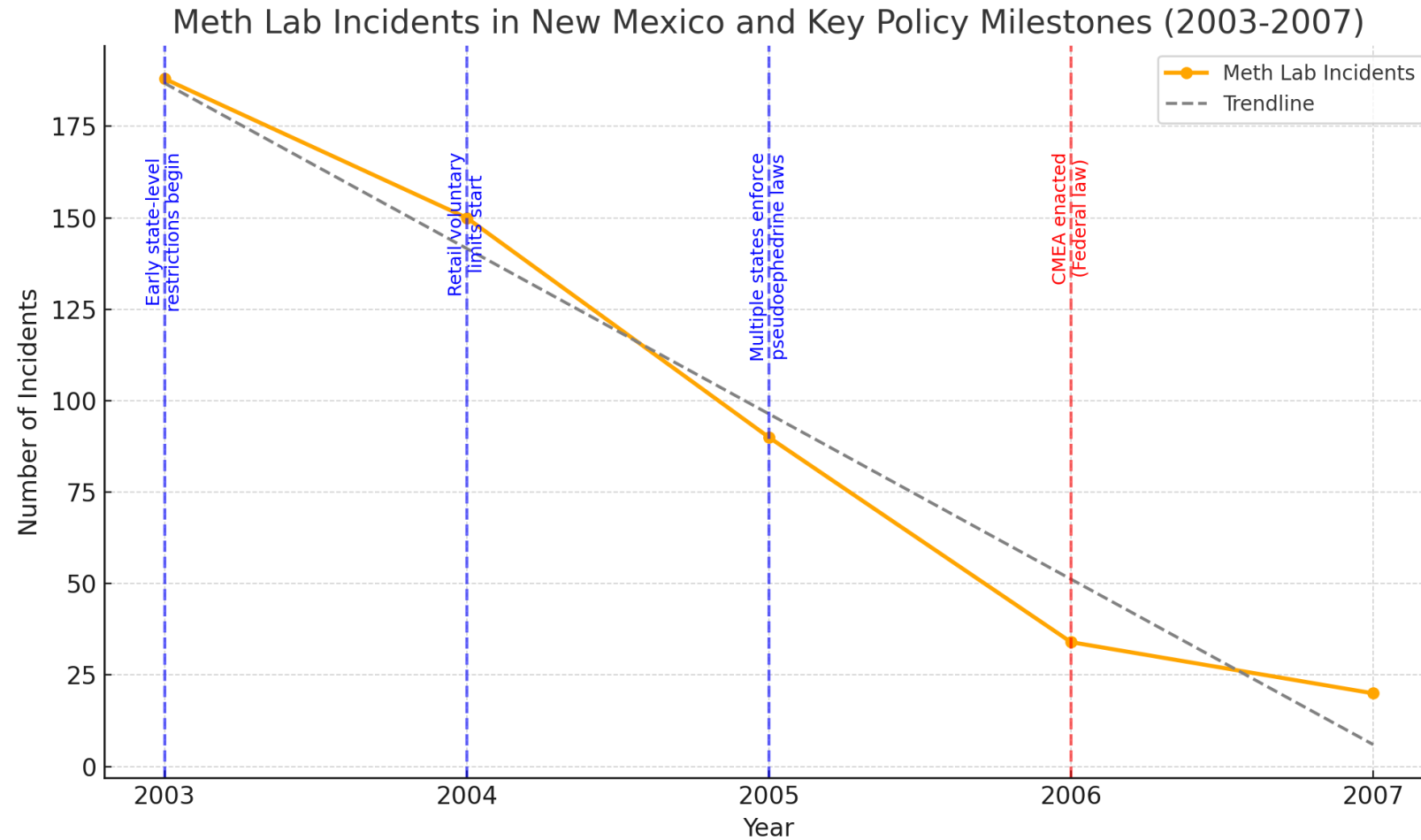


2006 (CMEA): NATIONAL LAW
STRENGTHENS THESE MEASURES

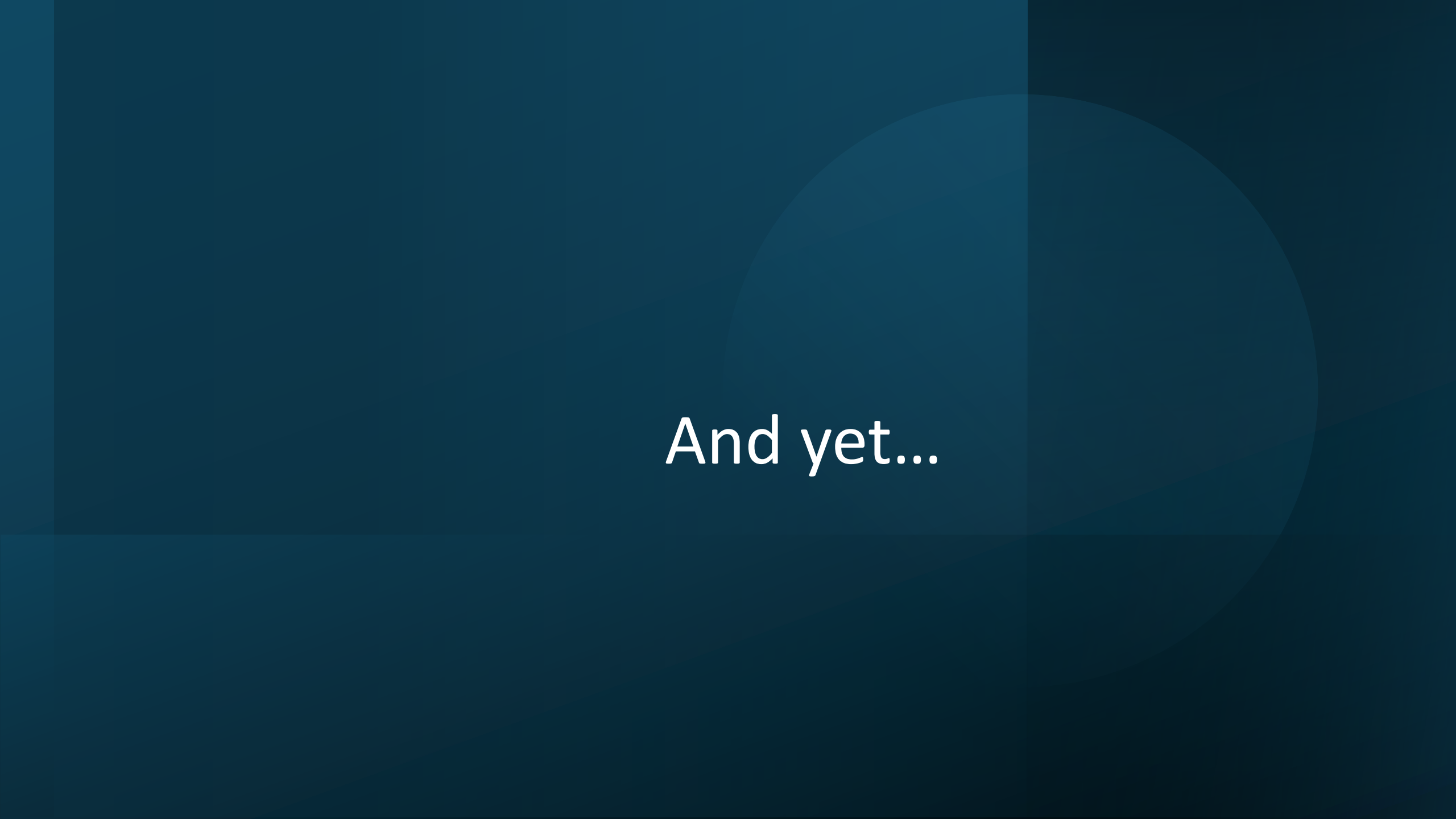
CMEA : (Combat Methamphetamine Epidemic Act)



Result?

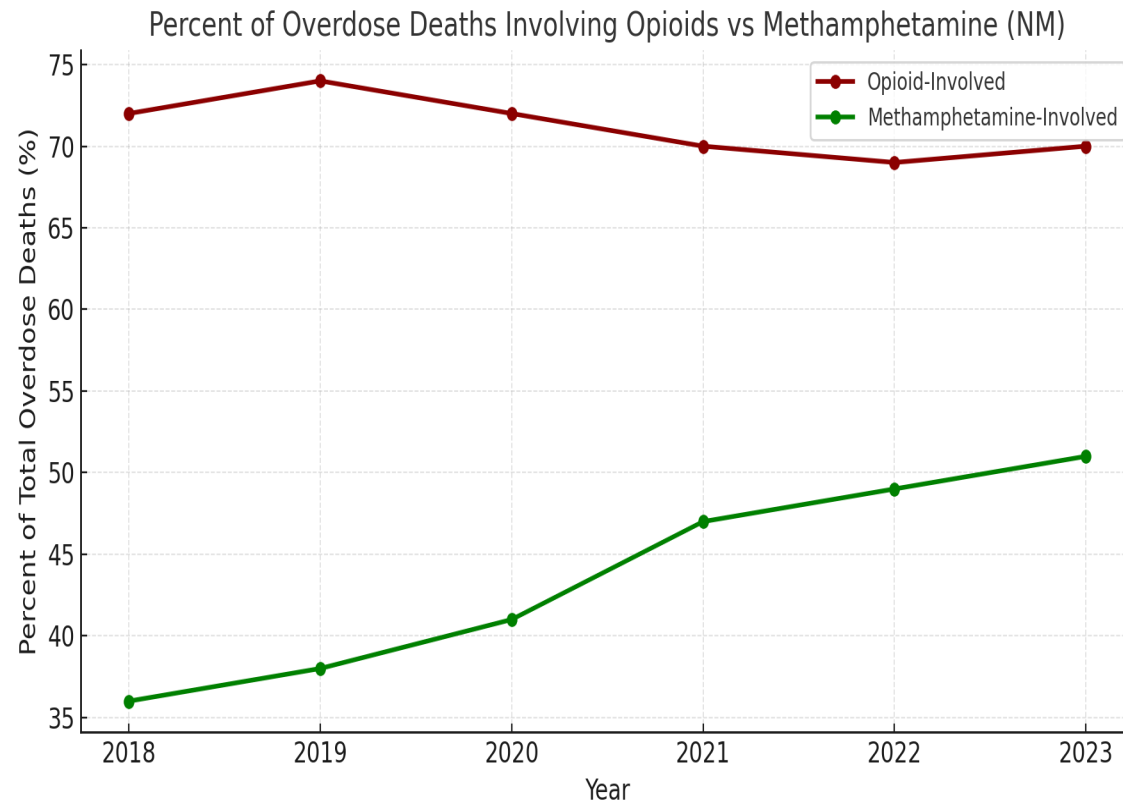


White House ONDCP. State Profile – New Mexico (2008). Available:
https://obamawhitehouse.archives.gov/sites/default/files/docs/state_profile_-_new_mexico.pdf GAO
Report (2009): Combat Methamphetamine Epidemic Act Implementation.
<https://www.gao.gov/products/gao-09-255> DEA Meth Lab Statistics.
<https://www.dea.gov/resources/statistics/meth-lab-ephedrine-pseudoephedrine-statistics> Koppel, R.
Journal of Drug Policy Analysis (2015).
<https://www.degruyter.com/document/doi/10.1515/jdpa-2015-0001/html>



And yet...

Opioid vs Methamphetamine Involvement (2018–2023)



Opioid-involved deaths:
~74% in 2019 → ~70%
in 2023.

Methamphetamine-
involved deaths: ~36%
in 2018 → ~51% in
2023.

Methamphetamines
are now nearly as
prevalent as opioids in
overdose fatalities.

- NMDOH NM-IBIS: Drug Overdose Data (<https://ibis.doh.nm.gov>)
- CDC WONDER: Overdose Death Statistics
- NM Legislative Finance Committee Substance Use Report (2023)
- Vera Institute: Overdose Deaths in NM
- UNM Health Sciences Center: Overdose Prevention Program



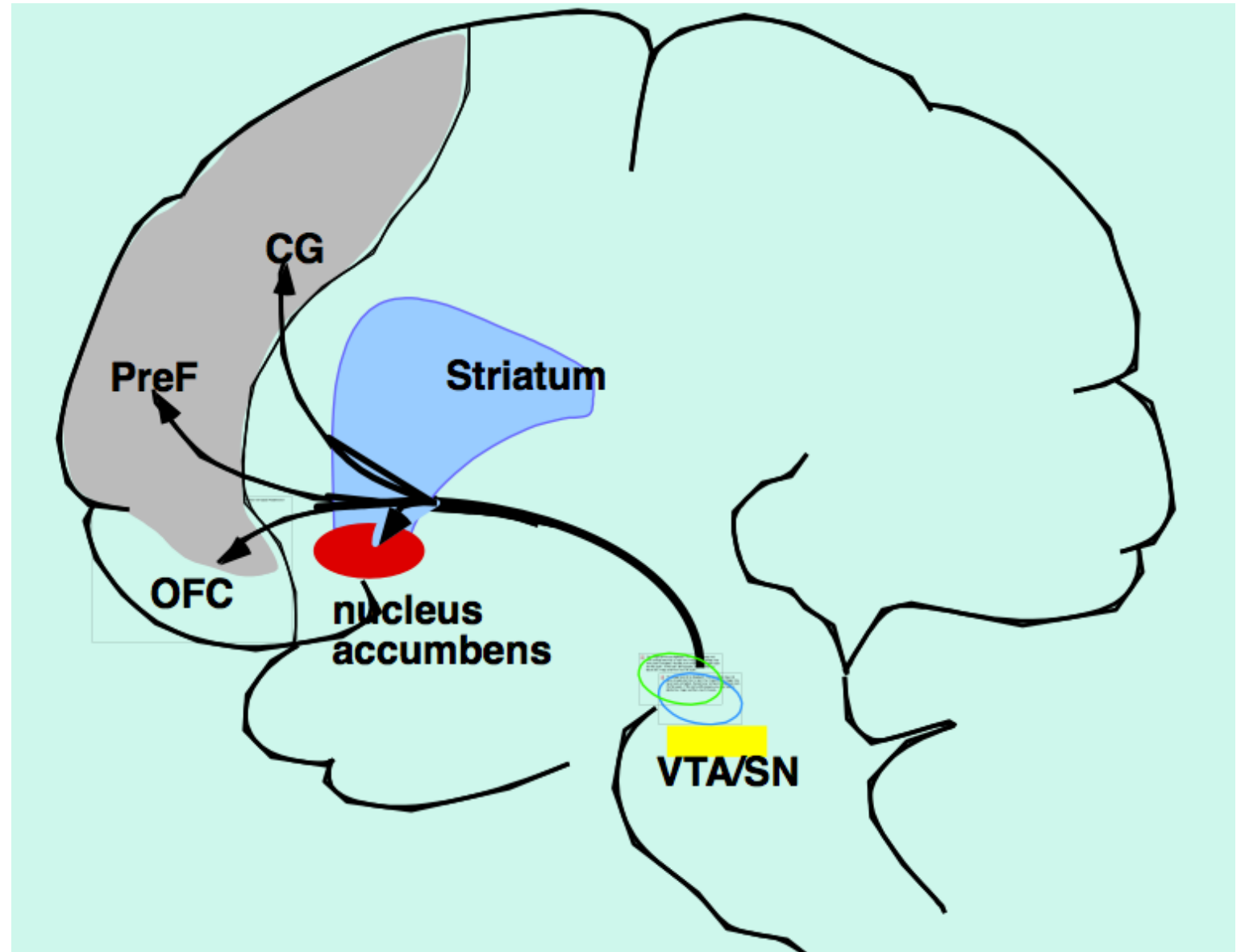
There is more of it

It is also INCREDIBLY rewarding

Objectives

Review	Review the scope of the problem
Discuss	Discuss the role of dopamine and dysregulation
Describe	Describe two behavioral health interventions
Discuss	Discuss research (past and present) on medications to treat methamphetamine and cocaine use disorders

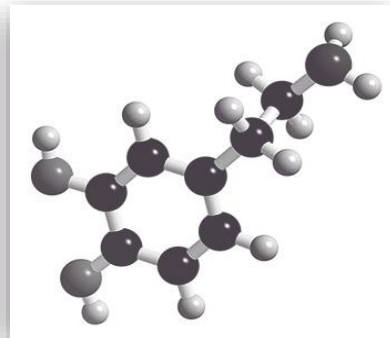
Mesolimbic Dopamine System



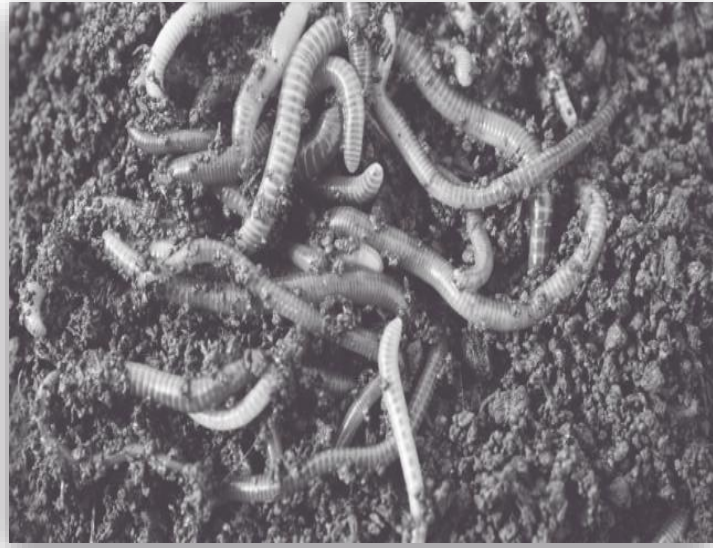
1950s : electrodes



1970s: Dopamine



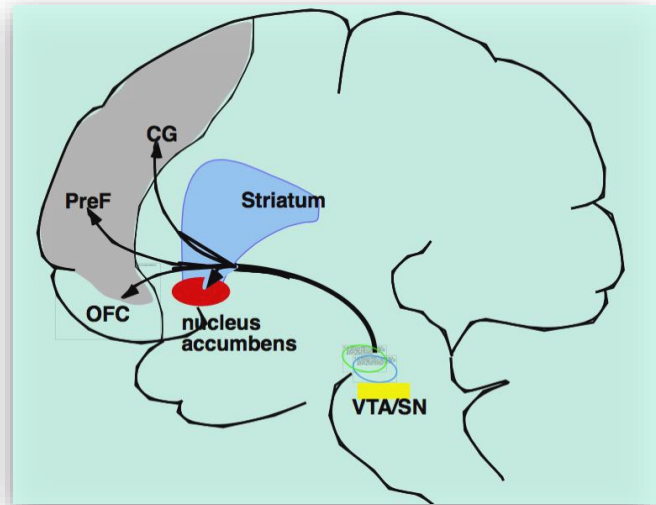
Desire and Drives



The use of dopamine neurons to shape responses to rewards is seen in simple organisms like worms and flies.

It evolved millions of years ago.

Dopaminergic impulses tell organisms to move toward reward (warmth, food, moisture)



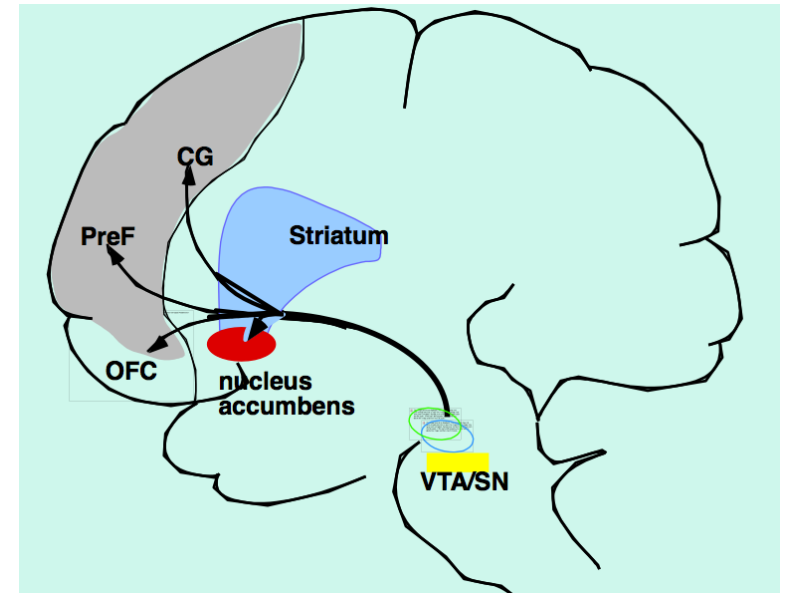
- In humans, those dopaminergic impulses travel through the NAC
- Mediates responses to food, sex, social interactions
- DA projections from VTA to NA release DA and tell the NA to go for it!
- Connects with memory and emotional centers so it can be repeated in the future

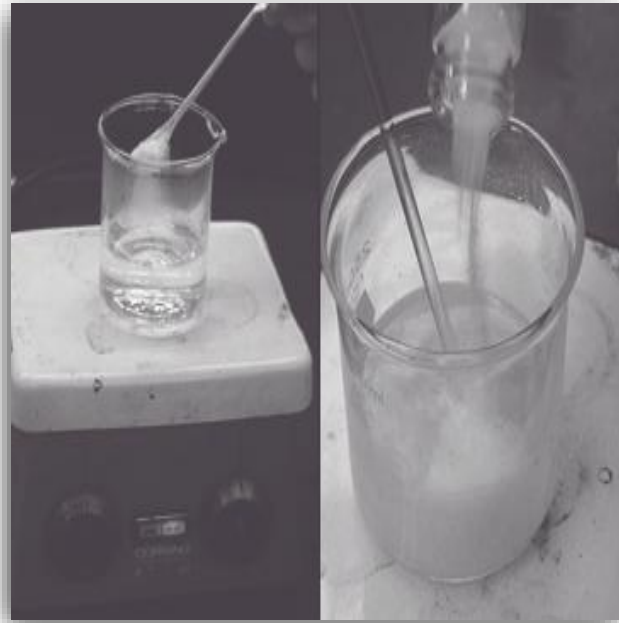


1. Hungry cavewoman eats berry. It is sweet and pleasurable
2. Brain pays very close attention to what he had to do to get that berry
3. Sees the berry bush again, more likely to remember the berry, even craves the berry. Eats the berry.
4. Lives

So, Part of Addiction is Craving

- Addiction taps into this normal brain process
- All addictive drugs activate this pathway
- Drug experience is deeply linked to memory and emotion

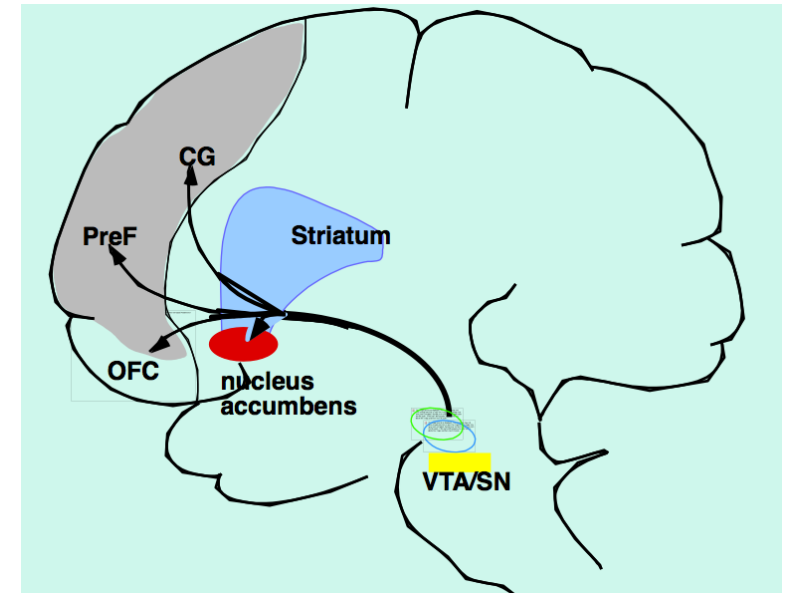


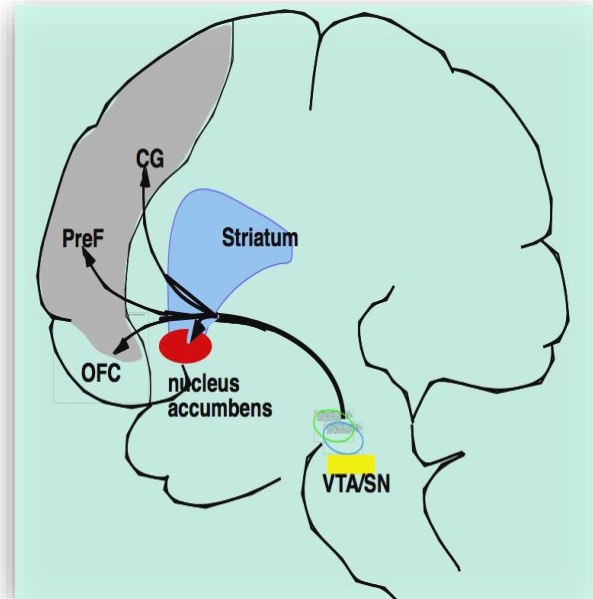


- People, places, things associated with drug use can trigger cravings
- Even when images associated with drug use are shown too rapidly to be “seen” they still trigger cravings

Part of it is
also
dysregulation

- Dysregulation:
impaired ability of
the front of the brain
to regulate what is
going on in the older
regions of the brain.
- Prefrontal cortex
helps determine the
risks and benefits of
behaviors and make
rational choices.





- Prefrontal cortex is newer and more complicated. It needs a little time to weigh in.
- Repeated activation of the VTA to NAC track slowly strengthens those connections. Habits get hard wired, fast and automatic



1. Hungry cavewoman eats berry. It is sweet and pleasurable, and she doesn't starve.
2. The berry gives her a headache the next day so she can't hunt well.
3. She has to weigh the benefits and drawbacks of the berries each time she thinks about eating them.
4. If her berry eating habit has become "hard-wired", she may eat them even on days when it is a really, really bad idea

Another complicating factor:

D1: Activate the nucleus accumbens, cause us to act & are responsive to big pleasure surges.

D2: Slow down decision making, allow the frontal cortex to step in. Responsive to smaller pleasures.

Big dopamine surges
activate the D1 receptors
and cause the D2 receptors
to be reabsorbed.

Repeated drug use speeds
up the Go! in the nucleus
accumbens and inhibits the
stop.

Like stepping on brakes of
car barreling down a hill
only to discover that brakes
have been disconnected.

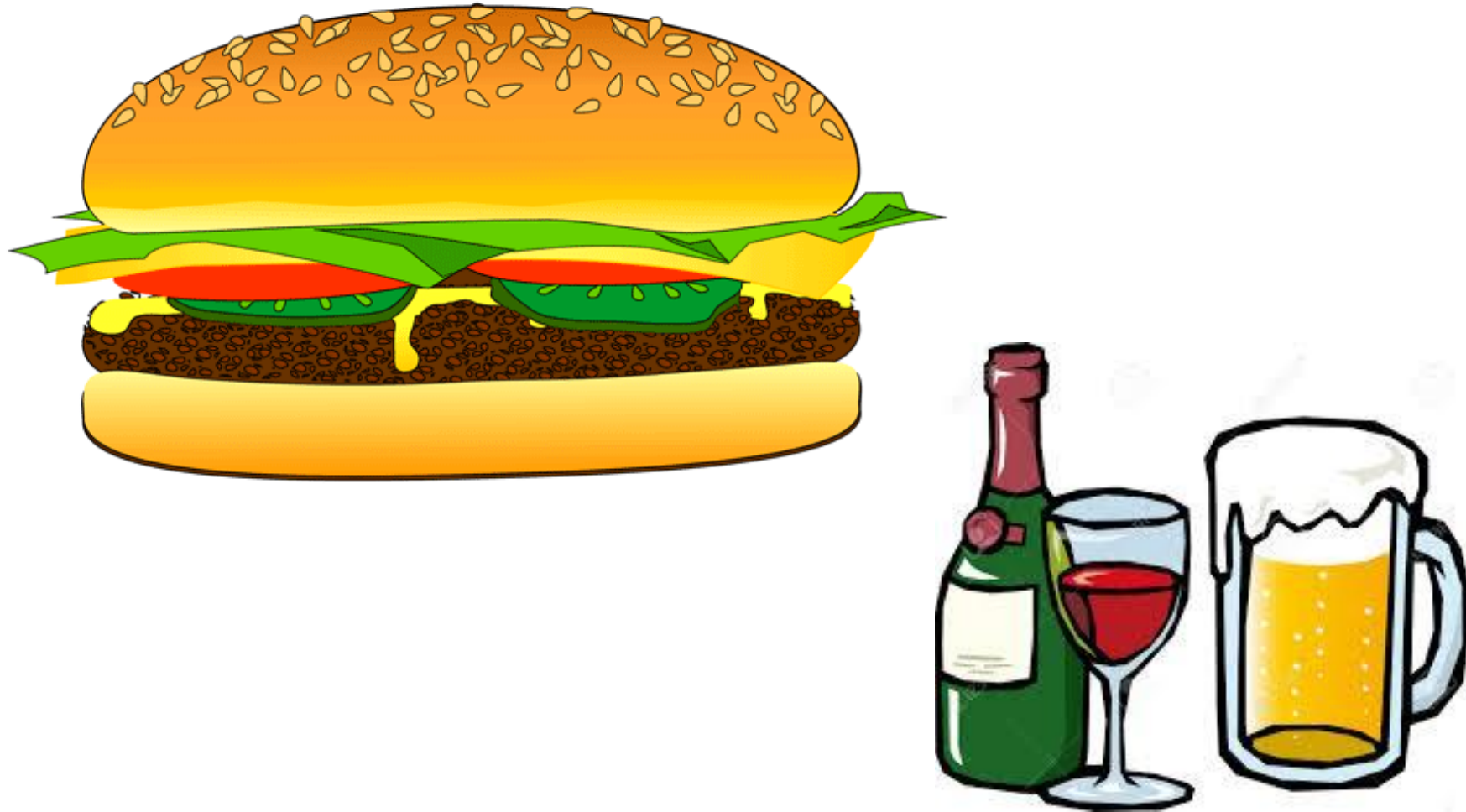


Both methamphetamine and cocaine increase dopamine

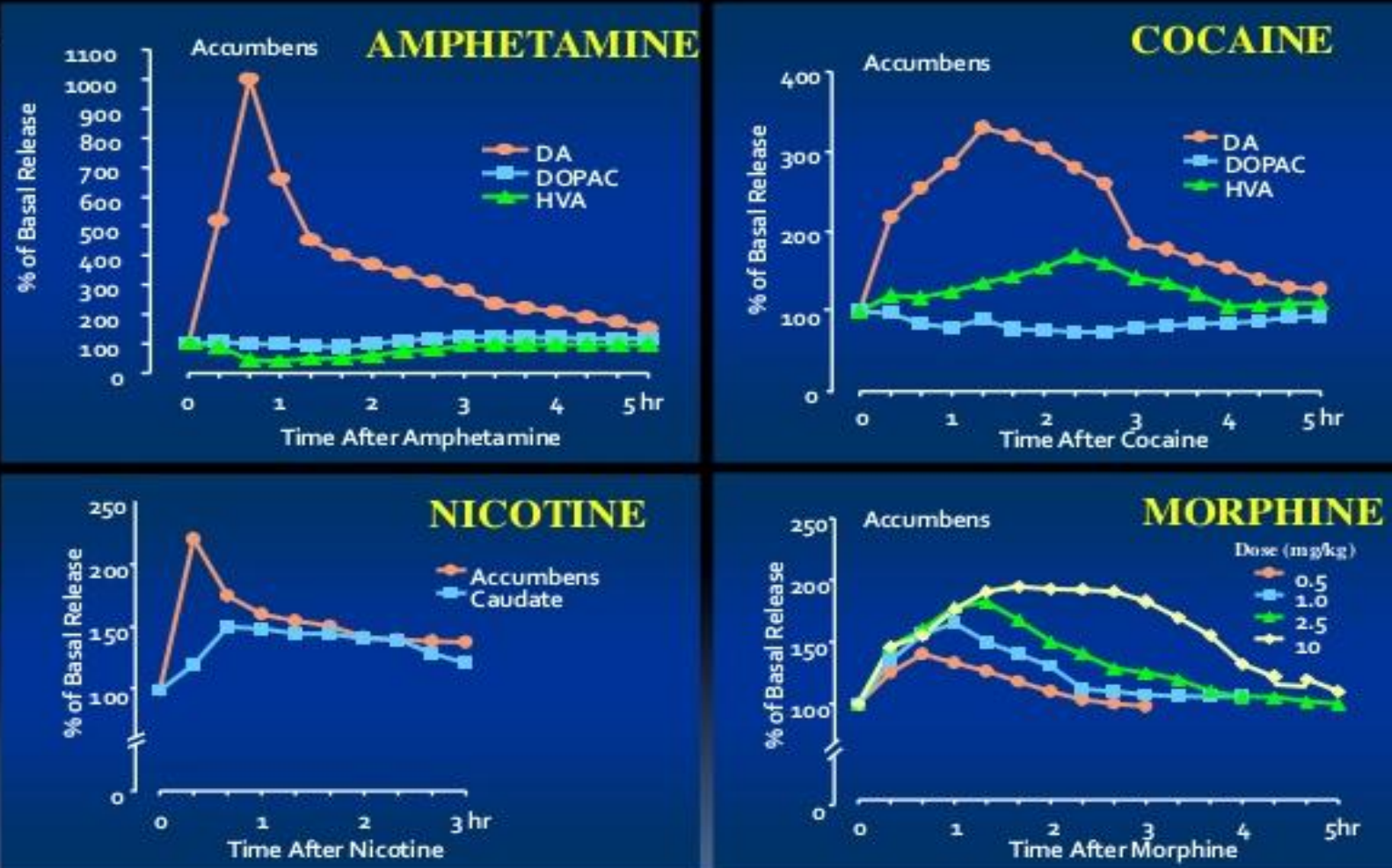
Cocaine works mainly by blocking the reuptake of dopamine, serotonin, and norepinephrine.

Methamphetamine increases the release of dopamine **and** inhibits its reuptake, leading to an increased concentration of dopamine in the synaptic cleft.

Increase dopamine to +/- 1.5 times basal output



Effects of Drugs on Dopamine Release



Di Chiara and Imperato, PNAS, 1988

Methamphetamine
lasts longer and is
more damaging to
the brain

There is more dopamine in the synaptic cleft for longer, increased production of reactive oxygen nitrogen species, and creation of an inflammatory state.

Methamphetamine vs. Cocaine

Methamphetamine

- synthetic
- high lasts 8-24 hours
- $T_{1/2}$: 12 hours
- mechanism: both DA reuptake and release
- limited medical uses
- neurotoxicity

Cocaine

- plant-derived
- high lasts 20-30 minutes
- $T_{1/2}$: 1 hour
- mechanism: mainly DA reuptake
- used medically
- not directly neurotoxic



Little pleasures like family, friends, jobs well done, tasks accomplished, provide just enough dopamine to activate the D2 receptors and strengthen the impulses that slow things down.

Medications to decrease craving and attenuate withdrawal symptoms

Behavioral interventions that entrain different habits

Objectives

Review	Review the scope of the problem
Discuss	Discuss the role of dopamine and dysregulation
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Contents lists available at ScienceDirect

Drug and Alcohol Dependence

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Review

Non-pharmacological interventions for methamphetamine use disorder: a systematic review

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Research Division, Institute of Mental Health, 10 Buangkok View, Singapore



ARTICLE INFO

Keywords:

Methamphetamine
Methamphetamine use disorder
Non-pharmacological interventions
abstinence

ABSTRACT

Background: Methamphetamine (METH) use is on the rise globally, with the number of treatment seekers increasing exponentially across the globe. Evidence-based therapies are needed to meet rising treatment needs. This systematic review intends to appraise the existing evidence to identify effective non-pharmaceutical approaches for the treatment of METH use disorder.

Methods: Five electronic bibliographic databases-Ovid (Medline), Embase, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Web of Science and PsycINFO-were searched to identify relevant studies that were published between January 1995 to February 2020. Studies were selected and assessed by two independent reviewers. A systematic review of data from both randomised control trials (RCT) and non-RCTs was conducted to appraise the evidence.

Results: A total of 44 studies were included in the review. Behavioural interventions, i.e. cognitive behavioural therapy (CBT), contingency management (CM), exercise, residential rehabilitation based therapies, repetitive transcranial magnetic stimulation (TMS), and matrix model demonstrated treatment efficacy in promoting abstinence, reducing methamphetamine use or craving in the participants. While CM interventions showed the strongest evidence favouring the outcomes assessed, tailored CBT alone or with CM was also effective in the target population.

Conclusions: Behavioural interventions should be considered as the first line of treatment for methamphetamine use disorder. Future studies should address the longevity of the effects, and limitations due to smaller sample sizes and high dropout rates to enable better assessment of evidence.

1. INTRODUCTION

Illicit amphetamine use has grown steadily over the last two decades with almost 28.9 million people using amphetamine type stimulants (ATS, amphetamine, methamphetamine, methylene dioxy methamphetamine and other designer amphetamines) in 2017 (United Nations Office on Drugs and Crime, 2019), with methamphetamine (METH) being the most frequently used and potent drug in the ATS family (Perez-mana et al., 2013). The overdose deaths involving METH tripled from 2011 to 2016 with a 29% increase per year (Hedegaard et al., 2018). METH is the fourth leading cause of drug overdose deaths in the US, accounting for 10.6% of deaths in 2016, 49.8% of which involved concomitant use of another drug(s) with heroin (21.8%), fentanyl (11.1%), and cocaine (8.3%) being the top 3 concomitant drugs. A recent cross-sectional study among a million patients showed a 486.7% increase in METH positive urine from 2013 to 2019 in the US (Twilman et al., 2020), which suggests another impending drug

epidemic.

Amphetamine abuse is often accompanied by physical (e.g., bloodborne diseases, Farrell et al., 2019) or psychological co-morbidities (Akindipe et al., 2014). Recent reports highlight the rapid increase in treatment-seeking amphetamine dependents that suggests an emerging global health challenge. In the US, amphetamine-related hospitalisation is the fourth most common drug-related hospitalisation after alcohol, opiates, and cannabis (National Admission to Substance Abuse Treatment Services, 2016). A cross-sectional study conducted using national hospital discharge data showed that amphetamine-related admissions increased steeply between 2008 to 2015 in the US. Mean in-hospital mortality was higher for amphetamine abuse than for any other substance abuse. The annual hospital-related cost for amphetamine abuse increased steadily from \$436 million in 2003 to \$2.17 billion in 2015 (Winkelman et al., 2018).

Despite being the second most common illicit drug abused worldwide (United Nations Office on Drugs and Crime, 2017), no approved

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<https://doi.org/10.1016/j.drugalcdep.2020.108060>

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0376-8716/ © 2020 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



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

Franco De Crescenzo, Marco Ciabattini, Gian Loreto D'Alò, Riccardo De Giorgi, Cinzia Del Giovane, Carolina Cassar, Luigi Janiri, Nicolas Clark, Michael Joshua Ostacher, Andrea Cipriani

Published: December 26, 2018 • <https://doi.org/10.1371/journal.pmed.1002715>

Article



Authors

Metrics

Comments

Media Coverage

Abstract

Author summary

Introduction

Methods

Results

Discussion

Supporting Information

Acknowledgments

References

Reader Comments (0)

Media Coverage (1)

Figures

Abstract

Background

Clinical guidelines recommend psychosocial interventions for cocaine and/or amphetamine addiction as first-line treatment, but it is still unclear which intervention, if any, should be offered first. We aimed to estimate the comparative effectiveness of all available psychosocial interventions (alone or in combination) for the short- and long-term treatment of people with cocaine and/or amphetamine addiction.

Methods and findings

We searched published and unpublished randomised controlled trials (RCTs) comparing any structured psychosocial intervention against an active control or treatment as usual (TAU) for the treatment of cocaine and/or amphetamine addiction in adults. Primary outcome measures were efficacy (proportion of patients in abstinence, assessed by urinalysis) and acceptability (proportion of patients who dropped out due to any cause) at the end of treatment, but we also measured the acute (12 weeks) and long-term (longest duration of study follow-up) effects of the interventions and the longest duration of abstinence. Odds ratios (ORs) and standardised mean differences were estimated using pairwise and network meta-analysis with random effects. The risk of bias of the included studies was assessed with the Cochrane tool, and the strength of evidence with the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. We followed the PRISMA for Network Meta-Analyses (PRISMA-NMA) guidelines, and the protocol was registered in PROSPERO (CRD 42017042900). We included 50 RCTs evaluating 12 psychosocial interventions or TAU in 6,942 participants. The strength of evidence ranged from high to very low. Compared to TAU, contingency management (CM) plus community reinforcement approach was the only intervention that increased the number of abstinent patients at the end of treatment (OR 2.84, 95% CI 1.24–6.51, $P = 0.013$), and also at 12 weeks (OR 7.60, 95% CI 2.03–28.37, $P = 0.002$) and at longest follow-up (OR 3.08, 95% CI 1.33–7.17, $P = 0.008$). At the end of treatment, CM plus community reinforcement approach had the highest number of statistically significant

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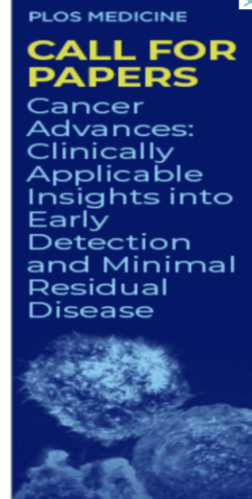


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- Most behavioral interventions (CBT, MI, Matrix model, exercise, CM) demonstrated some efficacy in reducing methamphetamine and cocaine cravings and use
- Contingency management most consistently showed reduced use, increased retention in treatment, and better quality of life
- Behavioral interventions = first-line treatment for stimulant use disorders



Photo courtesy of John Mahan MD

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

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).
2. Use an escalating schedule of reinforcement.



Photo courtesy of John Mahan MD

Example

Patient on long-term IV antibiotics who is often not in her room when it is time for her antibiotics. She likes chocolate and Starbuck's Frappuccinos

Target behavior: be in the room 8:00 am, noon, and 5 pm

Reward: Hershey's kiss each time she is in the room when the nurse arrives with antibiotics

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

National implementation of CM
at the VA

Over 2,000 patients treated in 94
programs

71.3% of programs had percent
negative rates above 90%

2018.

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 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

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

Harm reduction practices

2. Hydration

3. Toothbrushes

4. Condoms

5. Naloxone

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

Collins S et al. Intl Jnl of Drug Policy 2019

Thakrar K, Weinstein ZM, Walley AY. *Postgrad Med J.* 2016;92(1088):356–363.

Objectives

Review	Review the scope of the problem
Discuss	Discuss the role of dopamine and dysregulation
Describe	Describe two behavioral health interventions
Discuss	Discuss research (past and present) on medications to treat methamphetamine and cocaine use disorders

Pharmacotherapy for Cocaine Use Disorder—a Systematic Review and Meta-analysis

Brian Chan, MD MPH^{1,2}, Karli Kondo, PhD MA^{3,4}, Michele Freeman, MPH³, Chelsea Ayers, BA³, Jessica Montgomery, MPH³, and Devan Kansagara, MD MCR^{1,3,5}



¹Division of General Internal Medicine and Geriatrics, Oregon Health & Science University, Portland, OR, USA; ²Central City Concern, Portland, OR, USA; ³Evidence Synthesis Program Center, VA Portland Health Care System, Portland, OR, USA; ⁴Research Integrity Office, Oregon Health & Science University, Portland, OR, USA; ⁵Department of Medicine, VA Portland Health Care System, Portland, OR, USA.

BACKGROUND: Currently, there are no accepted FDA-approved pharmacotherapies for cocaine use disorder, though numerous medications have been tested in clinical trials. We conducted a systematic review and meta-analysis to better understand the effectiveness of pharmacotherapy for cocaine use disorder.

METHODS: We searched multiple data sources (MEDLINE, PsycINFO, and Cochrane Library) through November 2017 for systematic reviews and randomized controlled trials (RCTs) of pharmacological interventions in adults with cocaine use disorder. When possible, we combined the findings of trials with comparable interventions and outcome measures in random-effects meta-analyses. We assessed the risk of bias of individual trials and the strength of evidence for each outcome using standardized criteria. Outcomes included continuous abstinence (3+ consecutive weeks); cocaine use; harms; and study retention. For relapse prevention studies (participants abstinent at baseline), we examined lapse (first cocaine positive or missing UDS) and relapse (two consecutive cocaine positive or missed UDS).

RESULTS: Sixty-six different drugs or drug combinations were studied in seven systematic reviews and 48 RCTs that met inclusion criteria. Antidepressants were the most widely studied drug class (38 RCTs) but appear to have no effect on cocaine use or treatment retention. In-

Bupropion, psychostimulants, and topiramate may improve abstinence, and antipsychotics may improve retention. Contingency management and behavioral interventions along with pharmacotherapy should continue to be explored.

SR REGISTRATION: Prospero CRD42018085667

KEY WORDS: substance use; pharmacotherapy; systematic review; cocaine.

J Gen Intern Med 34(12):2858–73

DOI: 10.1007/s11606-019-05074-8

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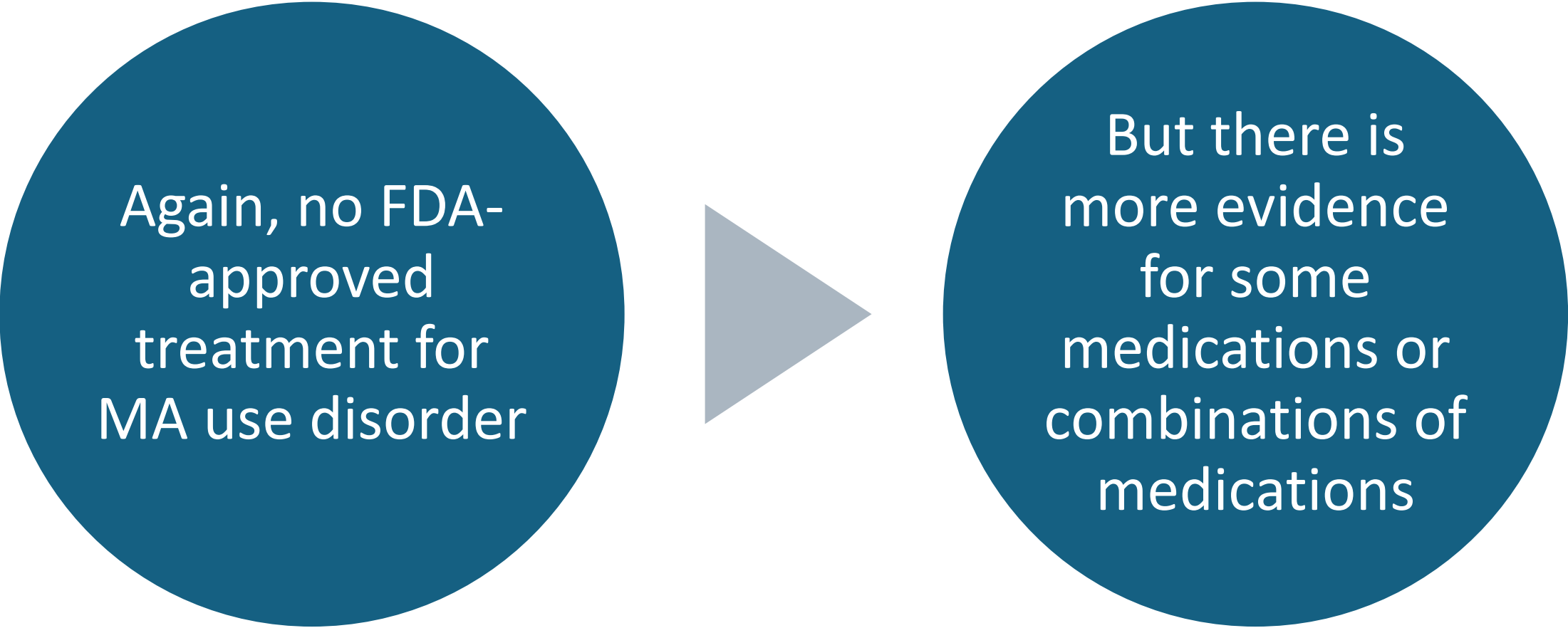
INTRODUCTION

Cocaine use disorder remains a serious problem in the USA and worldwide. In the USA, 900,000 adults met criteria for cocaine use disorder in 2014 and 40% of visits to emergency departments for drug misuse or abuse involved cocaine.¹ Cocaine use is associated with cardiovascular and neurologic effects, and chronic repeated exposure leads to tolerance,

“We found no strong evidence that any drug class was effective in increasing abstinence, reducing use, or improving retention rates for cocaine use disorder.”

“However, we found low SOE that bupropion, psychostimulants, and topiramate may improve abstinence.”

Medication for Methamphetamine Use Disorder



Again, no FDA-
approved
treatment for
MA use disorder

A diagram consisting of two dark blue circles connected by a light blue right-pointing triangle. The left circle contains the text 'Again, no FDA-approved treatment for MA use disorder'. The right circle contains the text 'But there is more evidence for some medications or combinations of medications'.

But there is
more evidence
for some
medications or
combinations of
medications

Lisdexamfetamine (Vyvanse)

A double-blind, placebo-controlled trial involving 164 participants with moderate to severe methamphetamine use disorder assessed the efficacy of lisdexamfetamine (250 mg daily) over 12 weeks.

Primary outcome = number of days of self-reported methamphetamine use in the past 28 days at the end of the treatment period.

Result: 53 days reported use in placebo v 44 days of use reported by study group, but no difference in UDS results

Mirtazapine

- RCT of 120 U.S. cisgender men and transgender women who have sex with men
- Randomized to placebo or mirtazapine 15mg/day x 7days then 30mg/day for 24 weeks.
- Reduction in + UDS compared to placebo despite low adherence in both study arms at 12, 24, and 36 weeks
- At 36 weeks 71% of UDS methamphetamine positive in the mirtazapine group vs 88% in the placebo group
- Improved sleep and depression scores
- Reduction in some high-risk sexual behaviors at 24 weeks

Bupropion + XR naltrexone

Injection every three weeks +
450mg/day bupropion

RCT of 403 participants over 12
weeks, checking UDS twice a week

Response = negative UDS three out of
four times in a row

13.6% of treatment group had a
response, 2.5% of placebo group

Other Investigated Agents

- Modafinil: No significant clinical benefit.

- Methylphenidate & Topiramate: Mixed preliminary results.

- Psychedelics (Ketamine): Pilot trials underway.

- Neuromodulation (Ultrasound, Brain Stimulation): Early-stage trials.

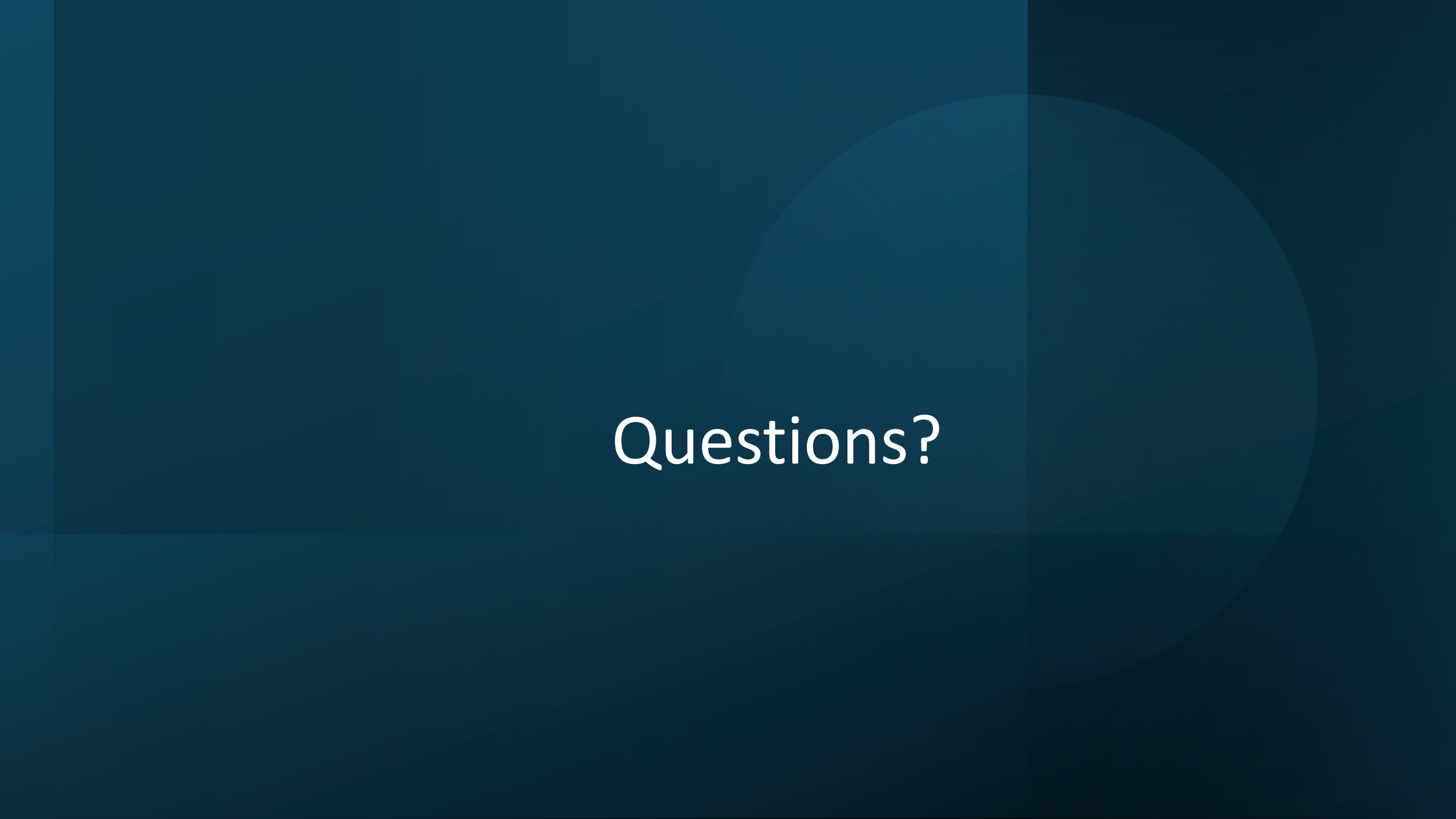
Summary

Stimulant use and use disorders are prevalent in New Mexico

There are effective behavioral interventions

Harm reduction is treatment

Medications can help.



Questions?

Medical issues r/t methamphetamine use

- Neurotoxicity, cognitive effects
 - Excessive DA damaging cell structures
 - Disruption of blood-barrier
 - Use is associated with poorer performance on motor and processing tasks, visual and verbal fluency
 - More than 2/3 of those with MUD show cognitive impairment
 - **May limit ability to follow through with treatment, understand advice, and achieve treatment outcomes**

Medical issues r/t methamphetamine use

- Cardiovascular and cerebrovascular
 - Leading cause of death with MUD
 - Strokes more common in young men (hemorrhagic)
 - Also associated with cardiac arrhythmia, cardiomyopathy

Lappin et al., 2017

Medical issues r/t methamphetamine use

- 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

Crystal methamphetamine

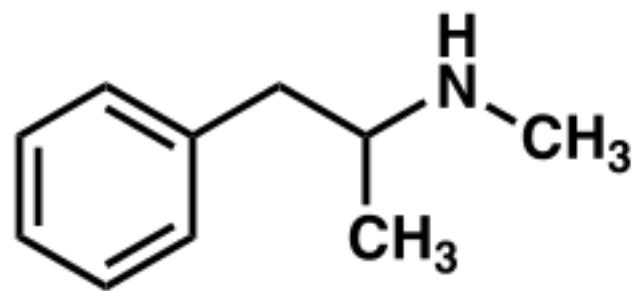
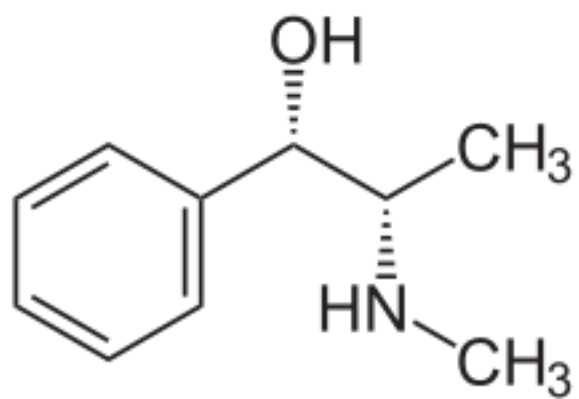
- Form of d-methamphetamine
- Closely related to amphetamine
- Longer lasting and more toxic to the CNS











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 Lithium 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 bottle.



2003–2004: State and voluntary retail restrictions

2005: Many states enforce pseudoephedrine control laws

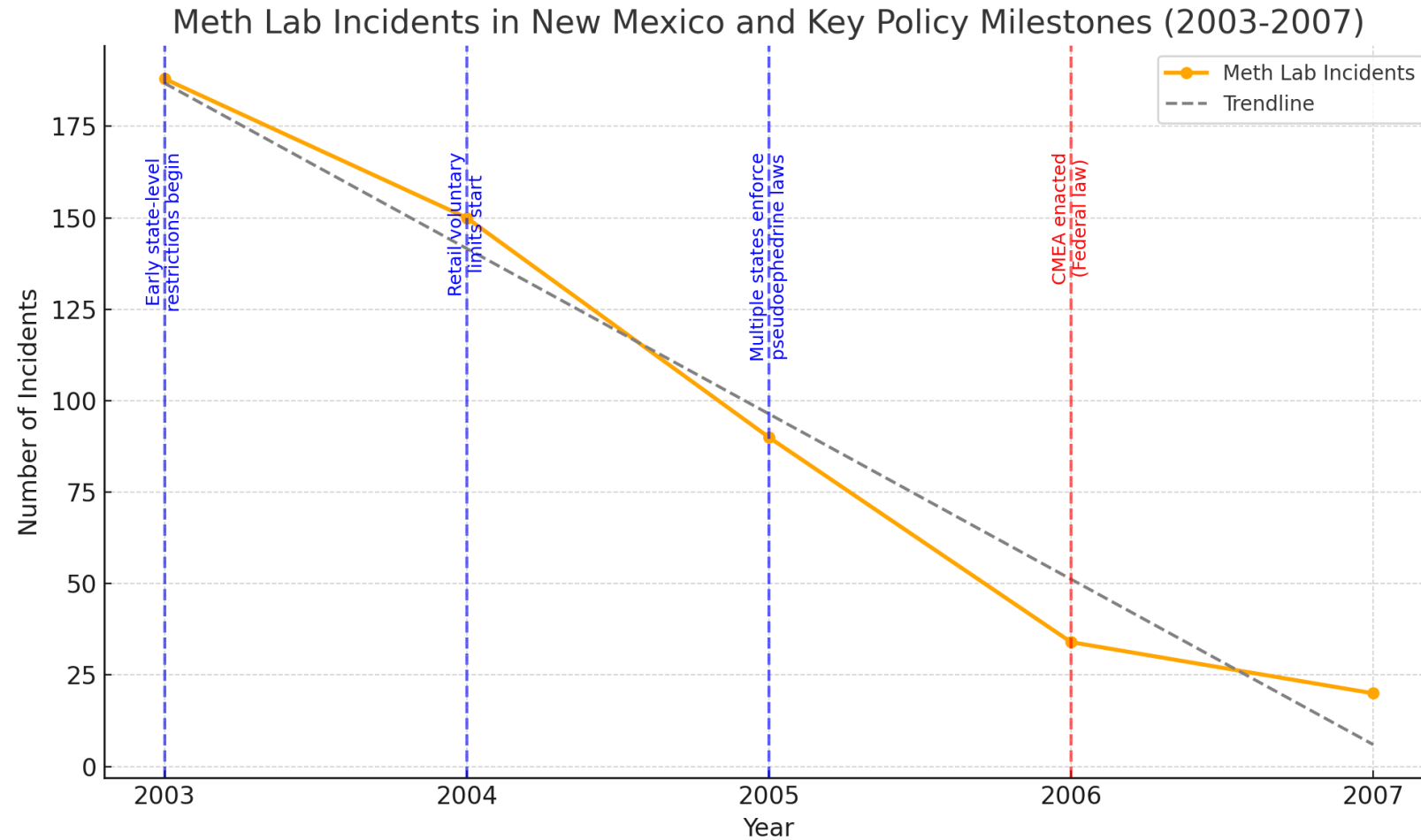
2006 (CMEA): National law standardizes and strengthens these measures

Supply also begins to shift to “superlabs” in Mexico

CMEA : (Combat Methamphetamine Epidemic Act)



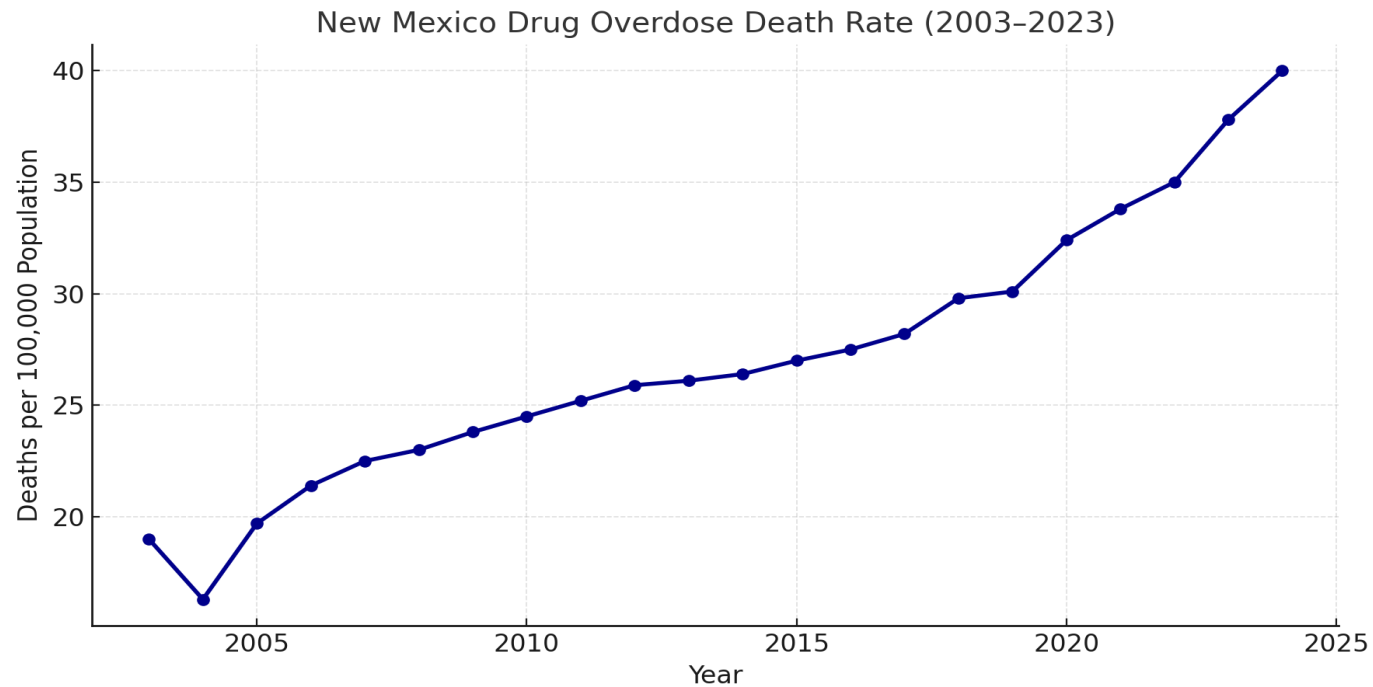
Result?



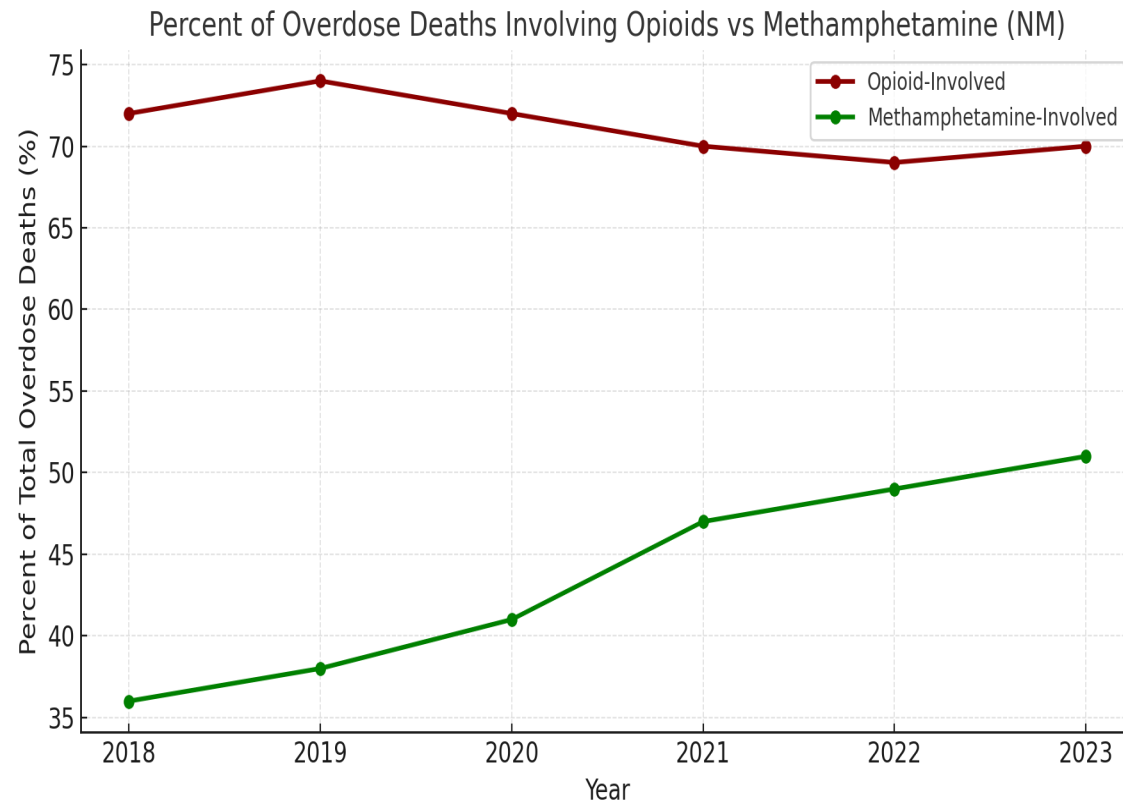
White House ONDCP. State Profile – New Mexico (2008). Available:
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Report (2009): Combat Methamphetamine Epidemic Act Implementation.
<https://www.gao.gov/products/gao-09-255> DEA Meth Lab Statistics.
<https://www.dea.gov/resources/statistics/meth-lab-ephedrine-pseudoephedrine-statistics> Koppel, R.
Journal of Drug Policy Analysis (2015).
<https://www.degruyter.com/document/doi/10.1515/jdpa-2015-0001/html>

And yet...

New Mexico Overdose Death Rate (2003–2023)



Opioid vs Methamphetamine Involvement (2018–2023)



Opioid-involved deaths:
~74% in 2019 → ~70%
in 2023.

Methamphetamine-
involved deaths: ~36%
in 2018 → ~51% in
2023.

Methamphetamines
are now nearly as
prevalent as opioids in
overdose fatalities.

- NMDOH NM-IBIS: Drug Overdose Data (<https://ibis.doh.nm.gov>)
- CDC WONDER: Overdose Death Statistics
- NM Legislative Finance Committee Substance Use Report (2023)
- Vera Institute: Overdose Deaths in NM
- UNM Health Sciences Center: Overdose Prevention Program

2003–2004: State and voluntary retail restrictions

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Supply also begins to shift to “superlabs” in Mexico



Insert slide here about bb and p2p

A recent systematic review on CM for methamphetamine use disorder

- 27 studies included (15 RCTs)
- CM increase methamphetamine abstinence
- CM increased retention, attendance, and treatment engagement
- CM reduced risky sex and number of sexual partners

Brown et al. Drug Alcohol Depend. 2020.

Medication for Cocaine Use Disorder

- Dextroamphetamine (Adderall)
 - Mimic agonist replacement therapy (like methadone for opioids). Multiple RCTs show reduced use. Often studied in extended-release forms.
- Topiramate
 - Reduces craving and use, possibly via glutamate modulation. Can cause cognitive side effects.

Tardelli VS et al. (2020). *Psychostimulant agonist treatment for cocaine dependence. Cochrane Database of Systematic Reviews.*

Mooney ME et al. (2009). *Safety and efficacy of mixed amphetamine salts in cocaine dependence.* **Source:** *J Clin Psychopharmacol.*

Johnson BA et al. (2007). *Topiramate for the treatment of cocaine addiction: a randomized clinical trial.* *JAMA*

- Opioid-involved deaths: ~74% in 2019 → ~70% in 2023.
- Methamphetamine-involved deaths: ~36% in 2018 → ~51% in 2023.

Methamphetamines are now approaching the prevalence of opioids in overdose fatalities.