Sexualized drug use and chemsex: a case-based workshop

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Disclosure Information

- Presenter 1: Cara Borelli, DO
  - No Disclosures
- Presenter 2: Chun Tong, MD
  - No Disclosures
- Presenter 3: Alyssa Cheng, DO
  - No Disclosures
- Presenter 3: Newman Kessler, MD
  - No Disclosures
- Presenter 4: Jenna Butner, MD, MPH, FASAM
  - No Disclosures

Learning Objectives

After participating in the session, attendees should be able to:

- Describe the current trends sexualized drug use in the LGBTQ population.
- Employ evidence-based substance use treatment in a culturally-competent manner to LGBTQ patients seeking treatment, including the overlap with mental health and medical care.
- Apply harm reduction strategies to chemsex and sexualized drug use.

Background

-Sexualized drug use refers to sexual activity while using psychoactive drugs to enhance the sexual experience, and it is often associated with gay and bisexual men

-“Chemsex” can be used broadly but typically refers to the use of gamma-hydroxybutyrate (GHB), methamphetamine, or mephedrone

Sources: Giorgetti R, Tagliabracci A, Schifano F, Zaami S, Marinelli E, Busardò FP. When "Chems" Meet Sex: A Rising Phenomenon Called "ChemSex". Curr Neuropharmacol. 2017;15(5):762-770. doi: 10.2174/1570159X15666161117151148. PMID: 27855594; PMCID: PMC5771052.

Substance use rates in the LGBTQ community

- Individuals in the LGBTQ have higher rates of mental health disorders and substance use disorder:
  - E.g., gay men were 2-3 times more likely to have had a major depressive episode in the past year than straight men
  - Approximately ¼ of lesbian women had a substance use disorder in the past year
  - The LGBTQ community is not a monolithic population; individualized research required

Source: Substance Abuse and Mental Health Services Administration. (2023). Lesbian, gay, and bisexual behavioral health: Results from the 2021 and 2022 National Surveys on Drug Use and Health (SAMHSA Publication No. PEP23-07-01-001). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration.

Stress Theory

- Minority stress theory: highlights unique stressors faced by sexual minorities (Ilan Meyer)
  - Distal stressors
    - Overt discrimination and harassment
    - Societal stigma
  - Proximal stressors/stress reactions
    - Internalized homophobia and stigma
    - Identity concealment
    - Rejection sensitivity
- Gay community stress theory: expands on minority stress-theory to focus on unique stressors originating within the gay community (Soulliard et al)
  - Focus on social status associated with appearance
  - Emphasis on a muscular body type as a masculine ideal
  - Scrutiny and objectification by other gay men who may be potential sexual partners

Background: treatment

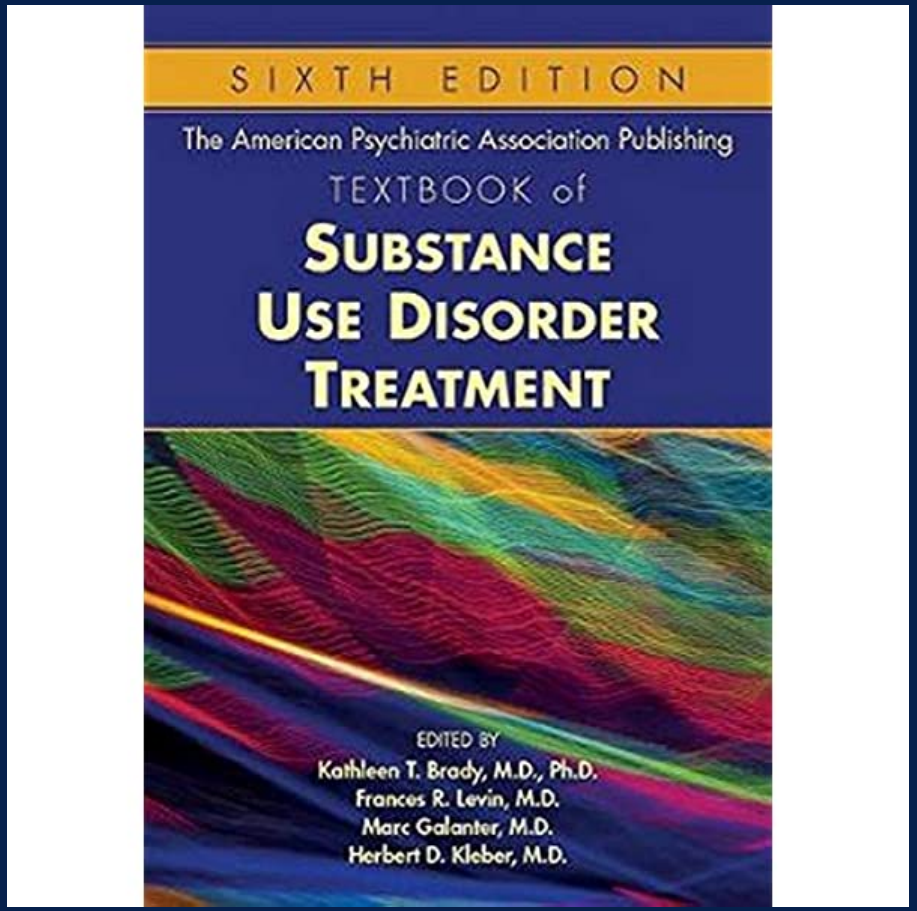
-Addressing substance use in the LGBTQ population should include assessment and referral if applicable for mental health co-morbidities.
-Offering relevant medical management is critical, including withdrawal treatment and medications for substance use disorders when applicable.
-Harm reduction can take many different forms in sexualized drug use including novel initiatives in the information age.
-Another emerging treatment modality is LGBTQ-specialized treatment programs for substance use, which were found to have better outcomes compared to non-specialized treatment programs.

Sources: Senreich E. Are specialized LGBT program components helpful for gay and bisexual men in substance abuse treatment? Subst Use Misuse. 2010;45(7-8):1077-1096. doi:10.3109/10826080903483855. Cochran BN, Peavy KM, Robohm JS. Do specialized services exist for LGBT individuals seeking treatment for substance misuse? A study of available treatment programs. Subst Use Misuse. 2007;42(1):161-176. doi:10.1080/10826080601094207.

Methamphetamine use in the information age

Chun Tong, MD
Addiction Psychiatry

No financial interests or relationships to disclose.


SIXTH EDITION
The American Psychiatric Association Publishing
TEXTBOOK of
SUBSTANCE USE DISORDER TREATMENT
EDITED BY
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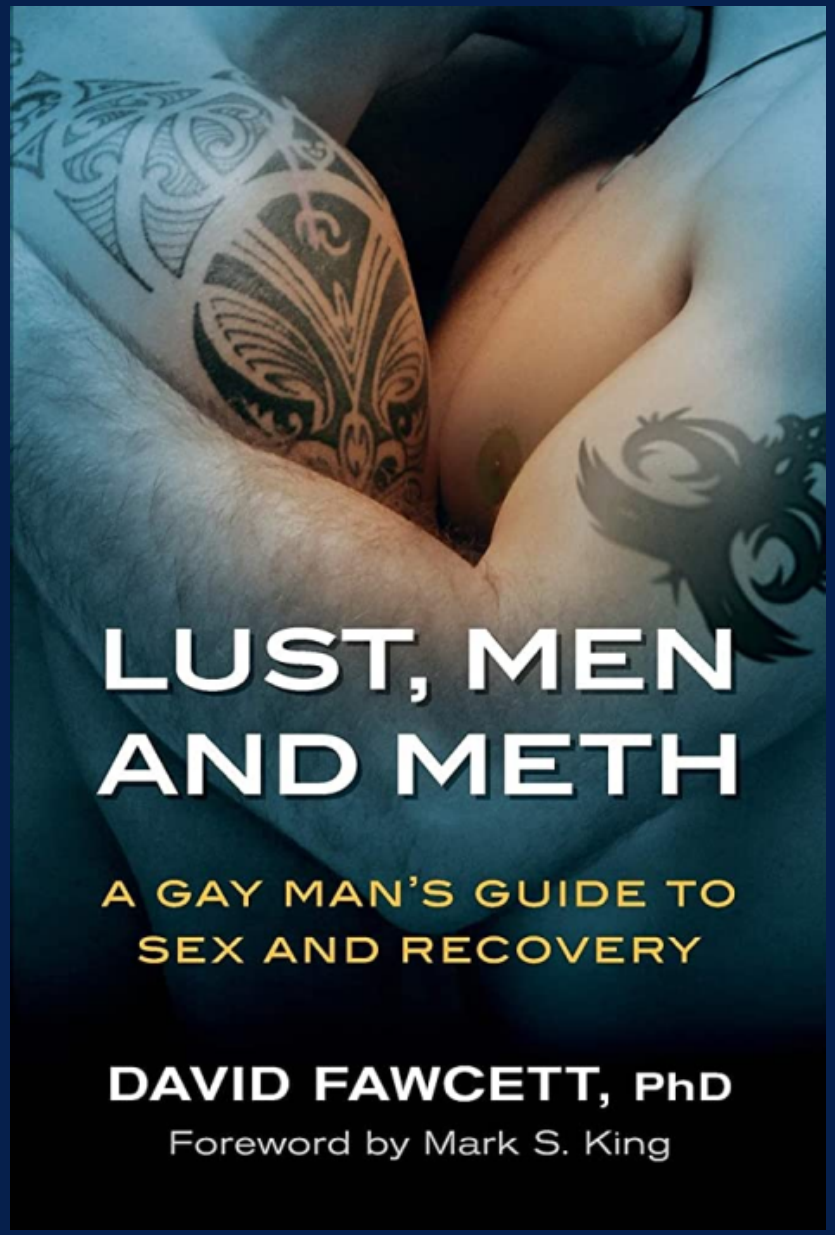
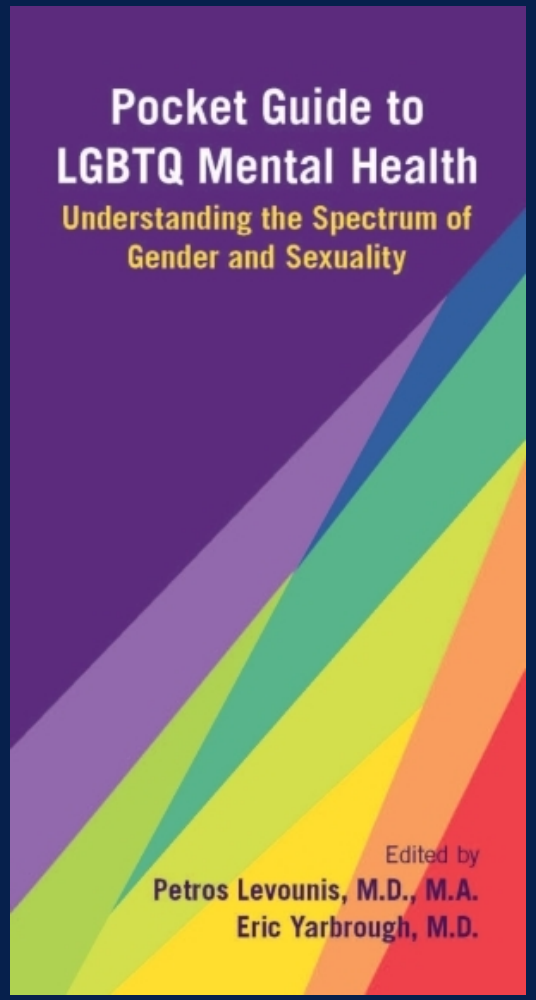

LUST, MEN AND METH
A GAY MAN'S GUIDE TO SEX AND RECOVERY
DAVID FAWCETT, PhD
Foreword by Mark S. King



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Mary E. Barber, M.D.
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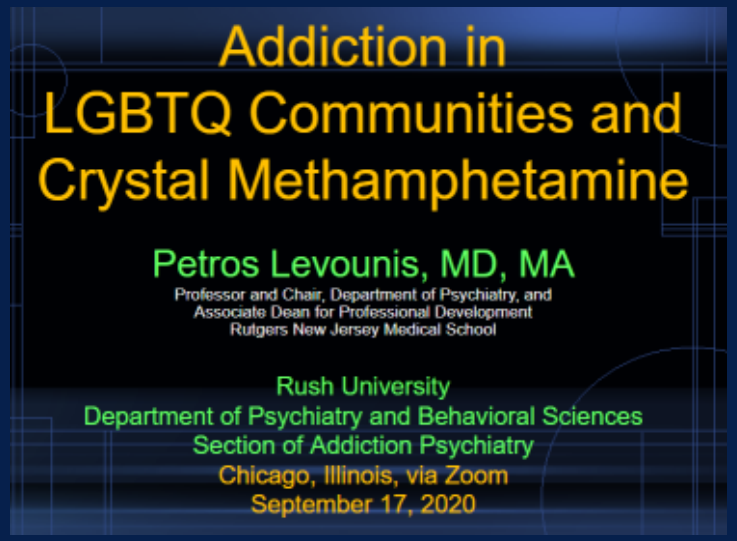
Petros Levounis, M.D., M.A.



Case

A 59-year-old, White/Caucasian, homosexual cis-gender man with a history of **stimulant use disorder** (crystal meth) and substance-induced mood disorder, present to the Addiction Institute (AI) outpatient clinic for follow up. The patient reports a gradual reduction of crystal meth use since he started follow up at **Crystal Clear**, and was referred to the clinic by his therapist for additional psychopharmacological intervention to help reduce his use further.

Case

He responded well to **Mirtazapine 30 mg PO QDay** (Coffin et al. 2020, Siegfried et al. 2020), coupled with various behavioral and social modification (emotional support animal, ESA). The patient reports **continue reduction in use**, down to about or less than once a month, and he attributes his improvement to medication and ESA. However, he still have trouble achieving total abstinence (his treatment goal).

Coffin PO, Santos G, Hern J, et al. Effects of Mirtazapine for Methamphetamine Use Disorder Among Cisgender Men and Transgender Women Who Have Sex With Men: A Placebo-Controlled Randomized Clinical Trial. JAMA Psychiatry. 2020;77(3):246–255. doi:10.1001/jamapsychiatry.2019.3655 Siefried KJ, Acheson LS, Lintzeris N, Ezard N. Pharmacological Treatment of Methamphetamine/Amphetamine Dependence: A Systematic Review. CNS Drugs. 2020 Apr;34(4):337-365. doi: 10.1007/s40263-020-00711-x. PMID: 32185696; PMCID: PMC7125061.

Case

Upon reviewing the last few uses in 2023, the patient report a pattern of downloading dating app/hookup app i.e. Grindr as a mean to look for user for intimacy & drug use. In the past, he would look for sex & users in bathhouses and through texting, and gradually it is replaced by mobile apps. He found himself deleting and re-downloading whenever he feels lonely or have craving.

What else would you want to know?
What would you recommend?

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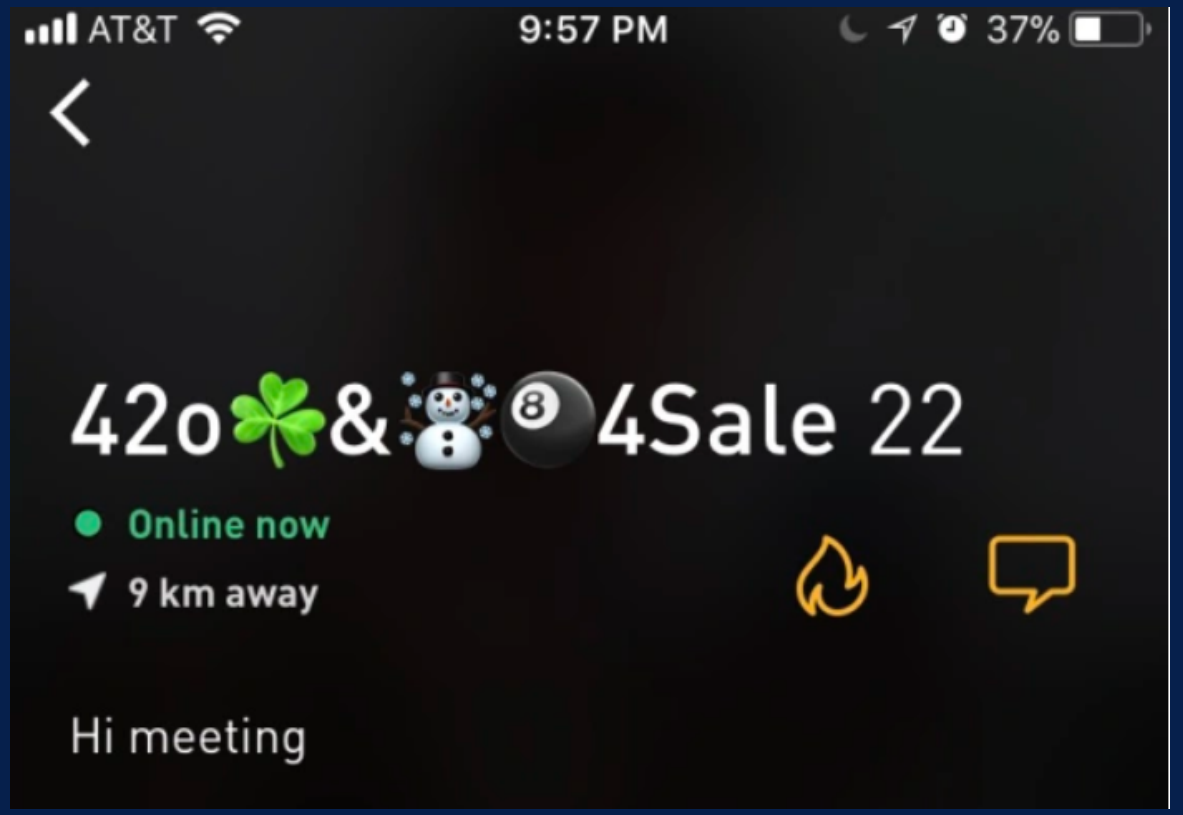
OUT HEALTH AND WELLNESS

Sex and drugs: Popular gay dating app allows users to find more than a date

Despite Grindr's past efforts to address the selling and promoting of drugs on its app, those who use it say there's still a robust market for illicit substances.


AT&T
5:37 PM
69%
ParTlyKloudy 25
Online now
686 m away
Can geT you whaT you looking for. Only contact me for business
Height 178 cm
Weight 70 kg
Body Type Slim
Looking for Networking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CRIME ▶
Grindr, Scruff Used to Arrest 60 on Drug Charges in Sting Operation
SWIPE LEFT FOR METH

Apps use & drug use

Phillips et al. 2014 – MSM that uses GSN app users reported a significantly higher use of crystal meth, poppers, and painkillers in the previous 12 months compared with non-users

Fansher and Eckinger 2020 - Tinder users (in a sample of US college students under age of 30) were more likely to have consumed drugs during the past three months than Tinder non-users

Erevik et al. 2020 - Tinder users (in a sample of single Norwegian students) were more likely to have consumed drugs during the past three months than Tinder non-users.

(?) The term “User” - is not universally defined.

- Phillips, Gregory, Manya Magnus, Irene Kuo, Anthony Rawls, James Peterson, Yujiang Jia, Jenevieve Opoku, and Alan E. Greenberg.2014. Use of Geosocial Networking (GSN) Mobile Phone Applications to Find Men for Sex by Men Who Have Sex with Men (MSM) in Washington, DC. AIDS and Behavior 18: 1630–37.
- Fansher, Ashley K., and Sara Eckinger. 2020. Tinder Tales: An Exploratory Study of Online Dating Users and Their Most Interesting Stories. Deviant Behavior, 1–15.
- Erevik, Eilin K., Joakim H. Kristensen, Torbjørn Torsheim, Øystein Vedaa, and Ståle Pallesen. 2020. Tinder Use and Romantic Relationship Formations: A Large-Scale Longitudinal Study. Frontiers in Psychology 11.

Apps use & drug use

social sciences

MDPI

Article

The Relationship between Drug Consumption and Dating App Use: Results from an Italian Survey

Luca Flesia [1,*], Valentina Fietta [2], Carlo Foresta [1] and Merylin Monaro [2]

1278 Italian respondents completed an online ad hoc questionnaire

- Using dating apps accounted for higher odds of cannabis use; however, people who intensely used the apps were less likely to consume marijuana
- Dating app use was not associated with the consumption of other drugs.

Apps use & drug use

social sciences

MDPI

Article

The Relationship between Drug Consumption and Dating App Use: Results from an Italian Survey

Luca Flesia [1,*], Valentina Fietta [2], Carlo Foresta [1] and Merylin Monaro [2]

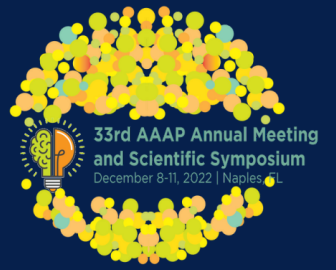
"*Evidence shows that differences in motivations for installing the apps are associated with differences in behavioral patterns.*"

- Flesia et al. 2021: Individuals using apps with the primary aim of finding friends were less likely to smoke or alcohol than other app users.
- "App user" is not precise enough.

Flesia, Luca, Valentina Fietta, Carlo Foresta, and Merylin Monaro. 2021a. Cigarette Smoking and Dating App Use: Findings from a Survey in a Sample of Adults in Italy. European Journal of Investigation in Health, Psychology and Education 11: 557–69.

Flesia, Luca, Valentina Fietta, Carlo Foresta, and Merylin Monaro. 2021b. The Association between Dating Apps and Alcohol Consumption in an Italian Sample of Active Users, Former Users, and Non-Users. Social Sciences 10: 249.

History & Epidemiology

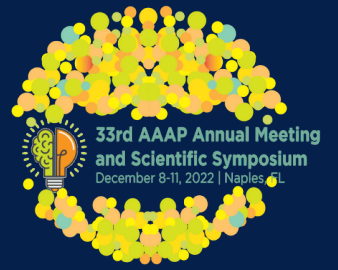


Cross-sectional study using NIH National Surveys on Drug Use and Health (NSDUH) **2015-2019**, & National Vital Statistics System Multiple Causes of Death files **2015-2019**, which looked at **195,711** respondents:

- Over **14.7 million people (5.4 percent of the population)** have tried methamphetamine at least once.
- **OD death ⬆ 180%** (5,526 → 15,489)
- Use ⬆ 43% (1.4 million → 2.0 million)
  - Frequent use ⬆ 66% (615,000 → 1,021,000)
  - Prevalence of MUD or injection surpassed the prevalence of methamphetamine use without MUD or injection since 2017 (60% to 67% vs 37% to 40%, 2017-2019)

- 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 Dec 1;78(12):1329-1342. doi: 10.1001/jamapsychiatry.2021.2588. PMID: 34550301; PMCID: PMC8459304.

History & Epidemiology



Cross-sectional study using NIH National Surveys on Drug Use and Health (NSDUH) **2015-2019**, & National Vital Statistics System Multiple Causes of Death files **2015-2019**, which looked at **195,711** respondents:

♀ > 3x increase adjusted prevalence of MUD among heterosexual women (from 0.24% to 0.74%) and lesbian or bisexual women (from 0.21% to 0.71%).

♂ > 2x increase adjusted prevalence of MUD among heterosexual men (from 0.29% to 0.79%) and gay or bisexual men (from 0.29% to 0.80%)

- 10x increase among Black individuals (from 0.06% to 0.64%; P < .001), nearly tripled among White individuals (from 0.28% to 0.78%; P < .001),

- 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 Dec 1;78(12):1329-1342. doi: 10.1001/jamapsychiatry.2021.2588. PMID: 34550301; PMCID: PMC8459304.

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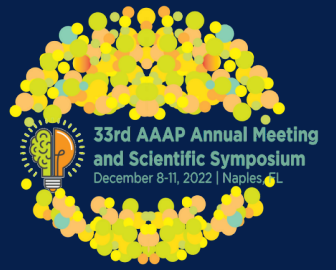

Cross-sectional study using NIH National Surveys on Drug Use and Health (NSDUH) **2015-2019**, & National Vital Statistics System Multiple Causes of Death files **2015-2019**, which looked at **195,711** respondents:

- Risk factors for methamphetamine use, MUD, injection, and frequent use:
  - ❑ lower educational attainment
  - ❑ lower annual household income
  - ❑ lack of insurance
  - ❑ housing instability
  - ❑ criminal justice involvement
  - ❑ comorbidities (eg, HIV/AIDS, hepatitis B or C virus, depression)
  - ❑ suicidal ideation, and
  - ❑ polysubstance use

- 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 Dec 1;78(12):1329-1342. doi: 10.1001/jamapsychiatry.2021.2588. PMID: 34550301; PMCID: PMC8459304.

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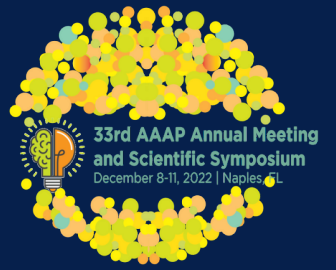

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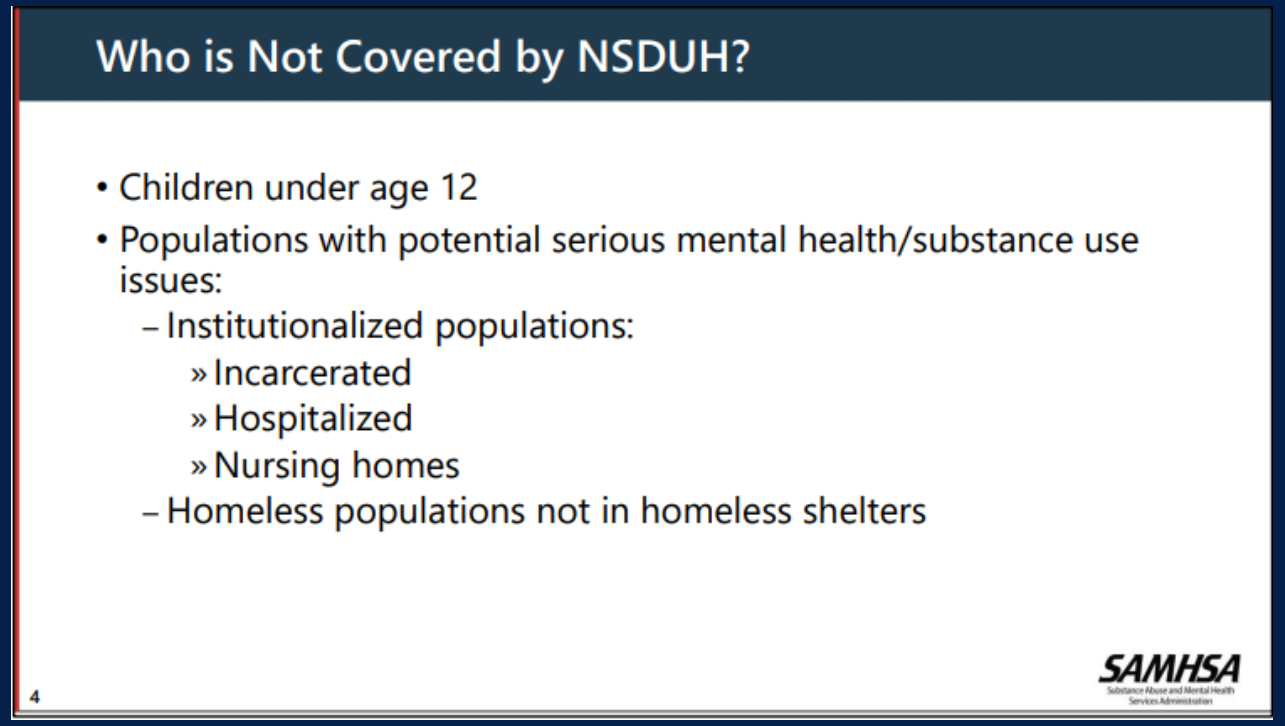

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American Academy of Addiction Psychiatry
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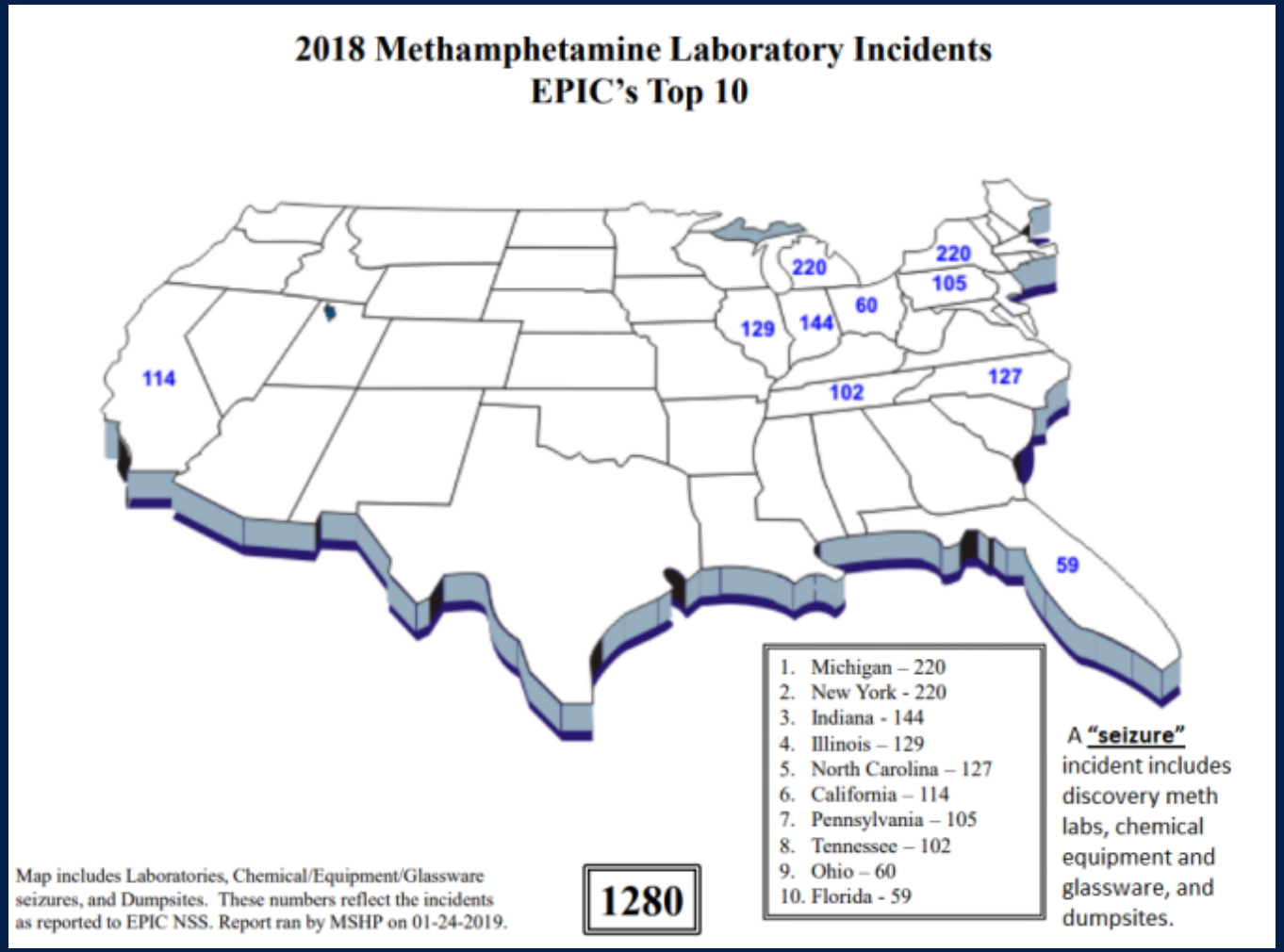
History & Epidemiology



The National Clandestine Laboratory Seizure system compiled by the Missouri State Highway Patrol

Neurobiology

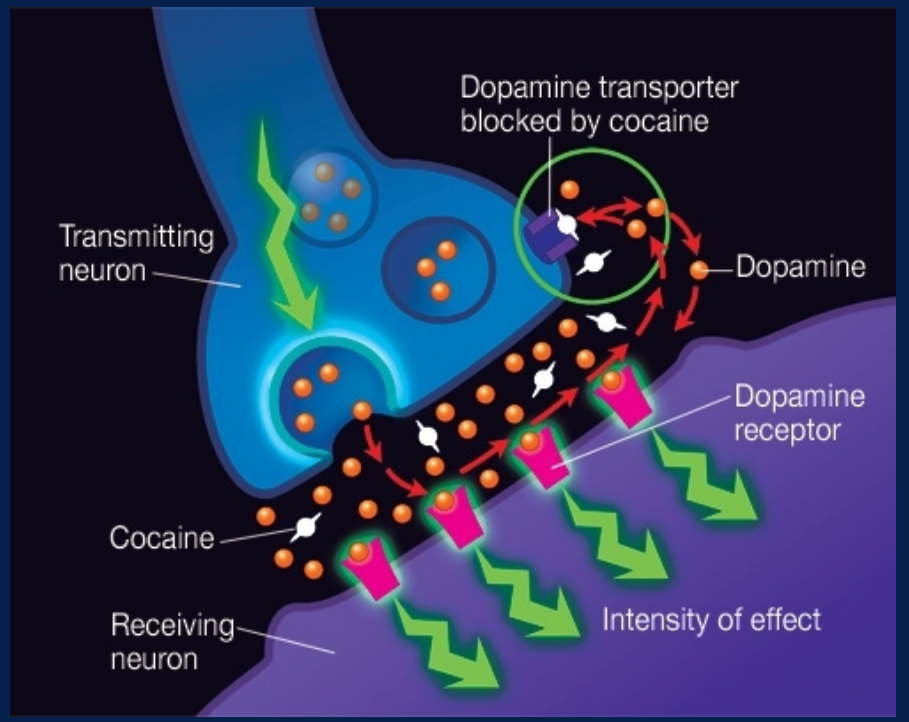
Stimulant use (Oral/Inhale/IV) → 1) blocking reuptake transporter and/or 2) blocking VMAT-2

- Euphoria
- Grandiosity
- Enhanced energy
- Alertness
- Suppression of appetite,
- Sexual stimulation
- Sociability

- Dysphoria
- Anxiety
- Restlessness
- Stereotypic behavior
- Psychomotor agitation
- Impaired judgement
- Psychosis
- Vomiting, Seizure, Delirium

Neurobiology

Stimulant use (Oral/Inhale/IV) → 1) blocking reuptake transporter and/or 2) blocking VMAT-2



Neurobiology

Stimulant use (Oral/Inhale/IV) → 1) blocking reuptake transporter and/or 2) blocking VMAT-2

- ↑ Dopamine - D1 activation → reward pathway
- ↑ Norepinephrine → increase arousal, cardiovascular and stress pathway
- ↑ Serotonin → elevates mood

Neurobiology

Stimulant use (Oral/Inhale/IV) → 1) blocking reuptake transporter and/or 2) blocking VMAT-2

- ↑ Glutamate: development of sensitization and craving
- ↑ GABA: attenuates reinforcement from stimulants and response to drug cues
- ↑ Acetylcholine: improves sustained attention
- ↑ Oxytocin: increase sociability
- ↑ CRF: activates stress pathways that facilitate drug seeking and relapse
- ✡TLR4 activation on microglia modulate the reinforcing effect of stimulants

Neurobiology

Incentive sensitization theory

- An attempt to explain the increase of craving despite reduce euphoric effect
- It theorized addiction as excessive amplification specifically of psychological 'wanting', especially triggered by cues, without necessarily an amplification of 'liking' (mediate by dopamine).
  - Prolonged stimulant use → Sensitization of dopamine and glutamate neurons in the mesolimbic system to drug-related cues
- Dopamine knockout mice still likes sugar, separating "liking" and "wanting"

Berridge KC, Robinson TE. Liking, wanting, and the incentive-sensitization theory of addiction. Am Psychol. 2016 Nov;71(8):670-679. doi: 10.1037/amp0000059. PMID: 27977239; PMCID: PMC5171207.

-Caffeine: inhibitor at the adenosine receptors

-Cocaine: dopamine transporter protein blockade->increased **dopamine** at the synaptic cleft

-Methamphetamine: increases release of norepinephrine, **dopamine**, and serotonin

-Amphetamines: catecholamine induction, particularly norepinephrine and **dopamine**

-Modafinil: dopamine uptake inhibitor, specifics unclear

-Methylphenidate: blocks **dopamine** transporter (DAT) and norepinephrine transporter (NET) ->increased dopamine and norepinephrine levels and decreased reuptake

-Nicotine: nicotinic agonist at nicotinic acetylcholine receptors, also stimulates the **dopaminergic** system

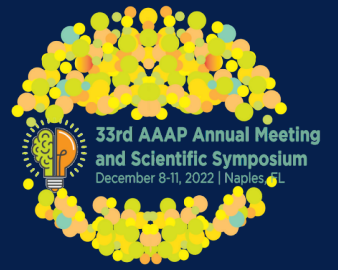
-Ephedrine (e.g., ma huang): increased norepinephrine activity

-Pseudoephedrine: increased norepinephrine activity

-True cathinones (e.g., khat): keto-amphetamine, increase **dopamine** release and inhibited reuptake of epinephrine, norepinephrine, and serotonin

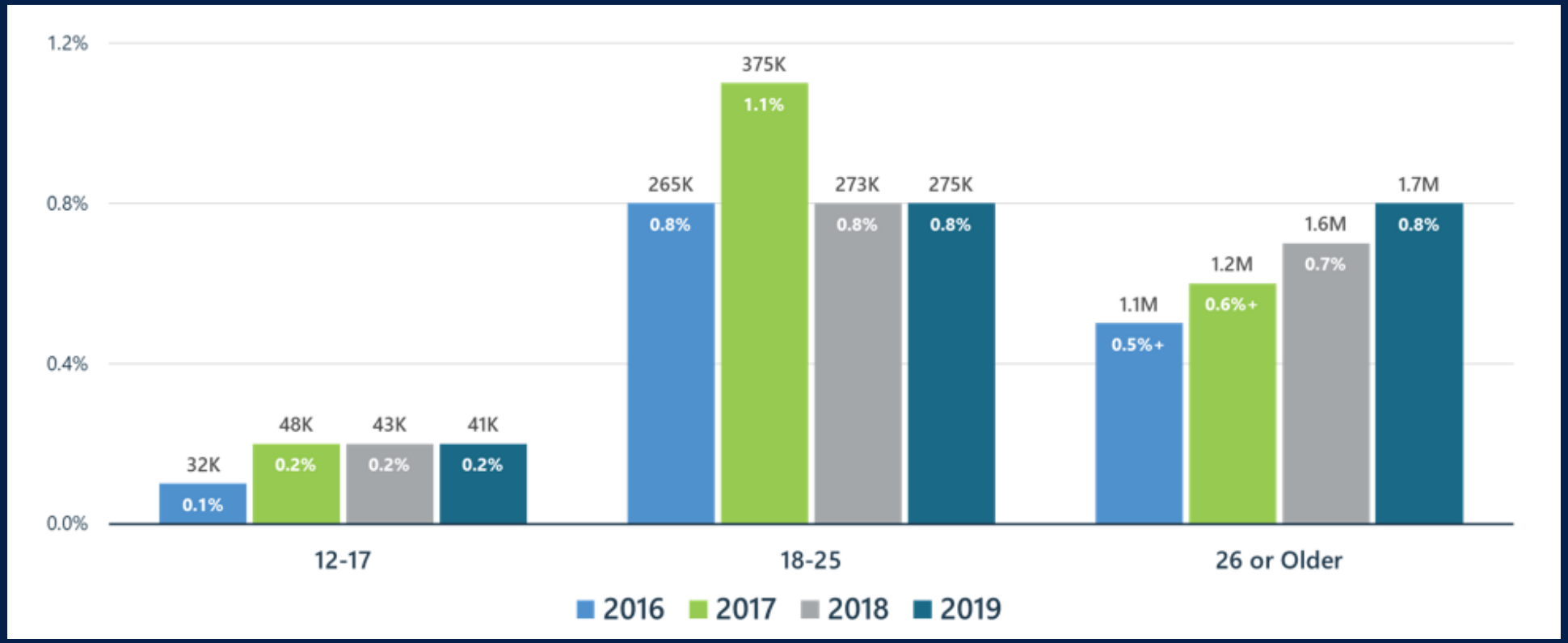
-Synthetic cathinones (e.g., bupropion, “bath salts”): similar to true cathinones

Screening for Methamphetamine Use



1. Physical Exam Findings
    a. Weight loss
    b. Dental caries
    c. Skin picking lesions
    d. Teeth grinding/jaw clenching
    e. Track marks
2. Medical Consequences
    a. Cardiomyopathy
    b. Malignant Hypertension
    c. Aortic Dissection
    d. Arrhythmias
    e. Coronary vasospasm
    f. Stroke (hemorrhagic)
    g. STIs

Methamphetamine 2016-2019

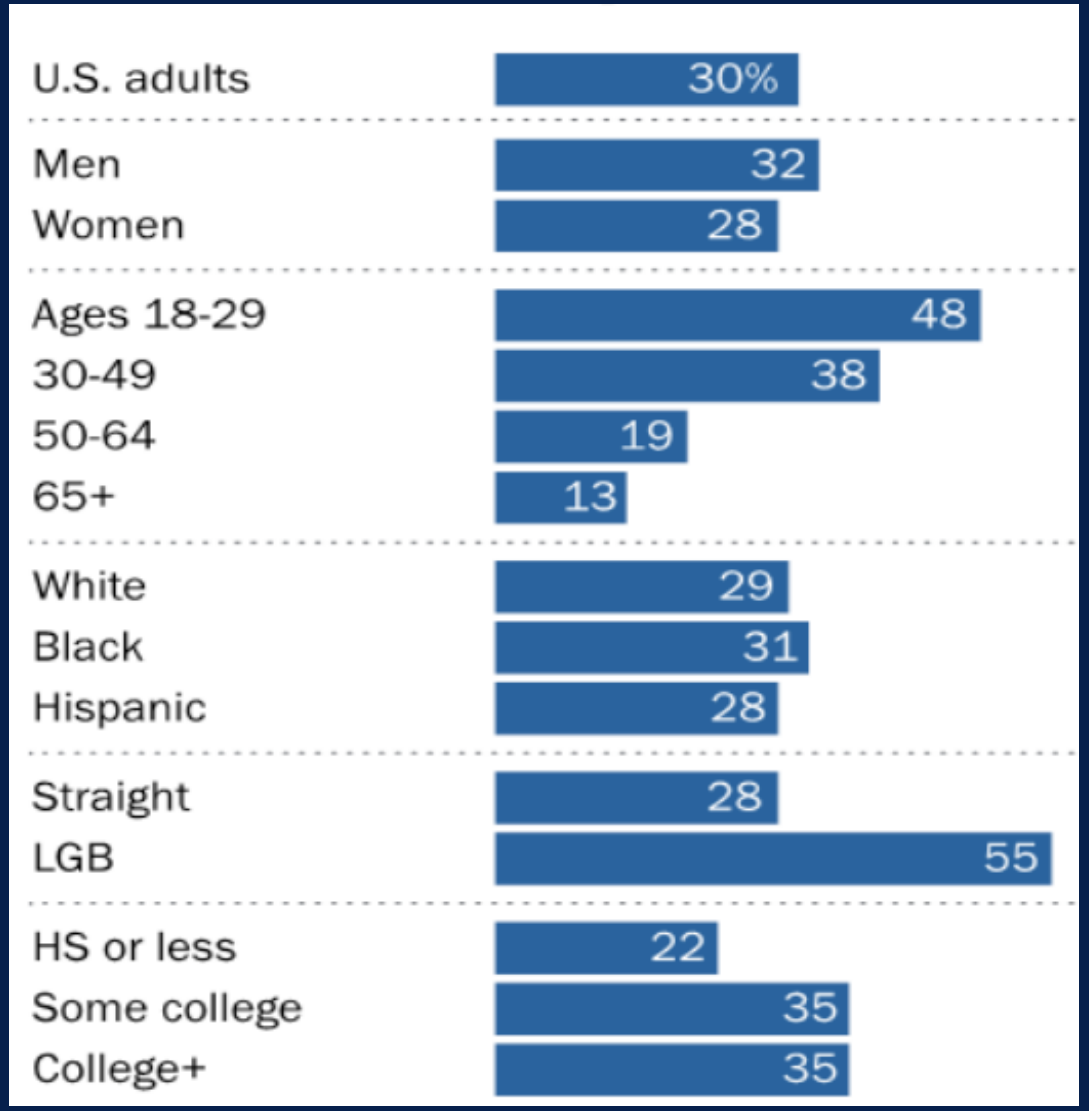


SAMHSA, *The National Survey on Drug Use and Health: 2019,* September 14, 2020.

Crystal, Sex, and Technology

- The Perfect Storm
- Sex, both virtual and real, both safe and unsafe, is only a click or a swipe away.
- Variable Intermittent Reinforcement

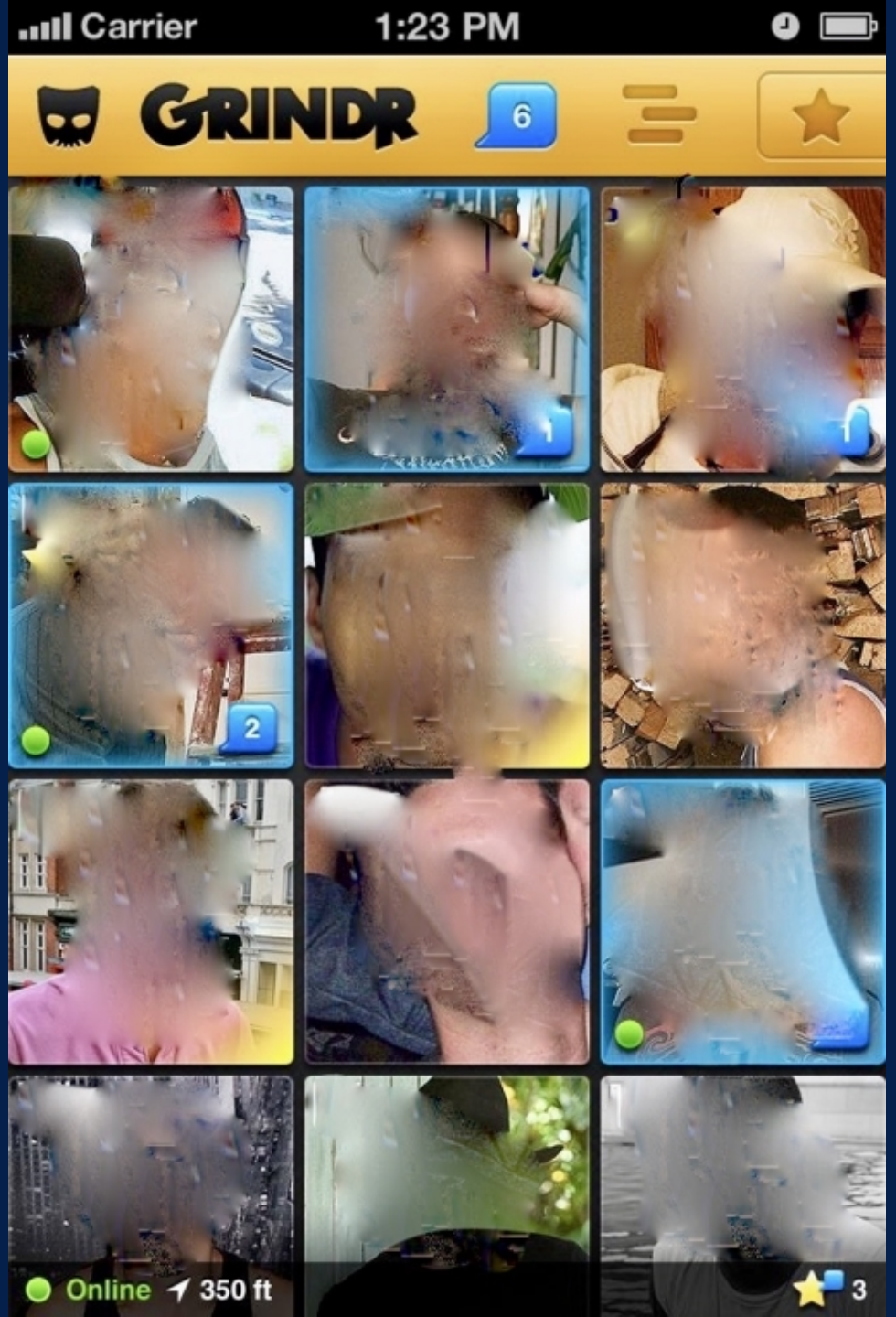
Dating Sites and Apps



The Social Network

- Scruff, Grindr, GROWLr etc.
- Adam4Adam or just “A4A” or “Adam”
- OkCupid, Plenty of Fish, and Tinder
- Tumblr, Reddit etc. non-dating site


ENGLISH
ESPAÑOL
FRANÇAIS
PORTUGUÊS
DEUTSCH
MANHUNT.net
N7
Member Name
Password:
Remember me
Did you forget your member name or password?
LOGIN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5/17/2023:

r/tifu
u/droopymangoes • 14h

NSFW

2 1

TIFU by smoking meth for the first time last weekend

L

I was talking to someone on Grindr after work Friday and they wanted to try something different. I was initially hesitant because this person seemed like they were into some high-risk stuff and didn't disclose their status without me inquiring about it. initially I said no and told them about the red flags. But I was thinking with my dick and not my head. Told myself I'm down to try new things so I went.

On my way home from work I turned the car around and drove to the location they sent me. I scoped out the perimeter and made my way into a parking spot. After keeping my wallet in the glove box, I got out of the car and walked up the stairs to the room. The door was unlocked, as agreed, and I walked into a dark room smelling of cheap cigarette smoke and the tv playing family guy. He was naked laying on the bed with a cigarette in his hand.

Slipping off my shoes and pants, I hopped onto the bed next to him. He insisted I take my shirt off too, to which I said no as I didn't want to stay very long. He started blowing me for a minute before stopping. He picked up his meth pipe, heated the bowl end, and blew a few mouthfuls of clouds. He asked if I wanted any and I said no. He continued back to blowing me again. I n planned to smoke meth. He took another break to smoke

1272 people are here

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BRASILIA BLUEBERRY
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ANTIOXIDANT INFUSION
YOUR TASTE BUDS WILL ALWAYS SWIPE RIGHT
5 Calories Per Serving
No Artificial Sweeteners

COVID-19

"A massive increase [in traffic] of 18.5% occurred on March 24th [2020] when it was announced that Pornhub's Premium service would be free to all visitors worldwide for one month to encourage people to stay at home and help flatten the curve of new COVID-19 cases."

Pornhub.com/Insights, 2020.

Cybersex: An All-Inclusive Term

- ✔Online Pornography
- ✔Online Dating
- ✔Sex Chats
- ✔Sex Webcams (w. Drug use?)
- ✔Teledildonics

Levounis and Sherer, *The Technological Addictions,* American Psychiatric Publishing, 2021

Self-Medication of Excess Social Stress

- Discrimination
- Expectation or Perception of Discrimination
- Internalized Homophobia
  - Labels
  - "Straight acting"
- Sense of belonging & empowerment → wrapped sense of confidence
  - Hypersexuality

Levounis P, Drescher J, Barber ME, *The LGBT Casebook*, 2012.

Treatment

- Group Psychotherapy
  - Crystal Clear - Joseph S. Ruggiero, PhD
- **Individual Counseling**
- Family Therapy
- Contingency Management (CM)
- Crystal Methamphetamine Anonymous
- Treatment of Co-occurring Disorders

Treatment

No FDA Approved medication for treatment of stimulant use disorders

Promising Candidates:

- Topiramate
- Bupropion
- Naltrexone (with or without buprenorphine)
- Amphetamine/Methylphenidate
- Modafinil
- Disulfiram
- Mirtazapine

Treatment

- Topiramate - some double-blind, placebo-controlled studies shows effect in curbing cocaine and meth use, but some are negative result through ?GABA activation and/or AMPA receptor antagonism
- Bupropion - randomized controlled trials demonstrate improved rates of cocaine abstinence when compared to placebo, and reduce meth relapse in heavier user, reduce use in light user.
- Naltrexone - opioid antagonist combine with buprenorphine ⇒ kappa antagonism
- Amphetamine/methylphenidate - agonist replacement approach, three-arm placebo-controlled trial for patient with comorbid ADHD can reduce cocaine use, safety concern
- Modafinil (?) - dopamine and NE transporter inhibitor, for narcolepsy, OSA, shift work disorder. Result is mixed on reducing cocaine craving and use
- Disulfiram - limited efficacy in the treatment of cocaine use d/o by inhibiting dopamine beta-hydroxylase → increase dopamine, but it also slows cocaine metabolism and is caution for cardiovascular risk
- Mirtazpine - 5-HT2 and 3 receptor antagonist. Some utility in reducing meth use and high risk sexual behaviors in meth user independently of its effects on depression.
- Cocaine vaccine dAd5GNE - active research. Current hurdle: need high anti-cocaine antibody titers

Summary

-Excess stress is likely responsible for higher rates of use among LGBTQ people.

-Crystal meth is the turbo cocaine (higher dopamine spike, longer acting)

Internet and apps have revolutionized drugs and sex.

-Psychotherapy >> pharmacotherapy

-Cultural humility and sensitivity is key to prevention.

A case of severe gamma-hydroxybutyrate (GHB) withdrawal with hemodynamic lability and rhabdomyolysis

Cara Borelli, DO
Addiction Medicine
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No financial interests or relationships to disclose.

Case presentation: history

-A 26-year-old male presented to the emergency department seeking treatment for GHB (gamma-hydroxybutyrate) withdrawal. He had a history of ADHD and opioid use disorder in sustained remission (past cardiac arrest from overdose).

-He reported using 3mL of GHB orally every hour including waking up at night to use GHB for the last 2.5 years.

-He reported smoking methamphetamine several times per day. He denied using any other substances including no alcohol.

-He had last used GHB and methamphetamine 2 hours prior to presentation in the emergency department.

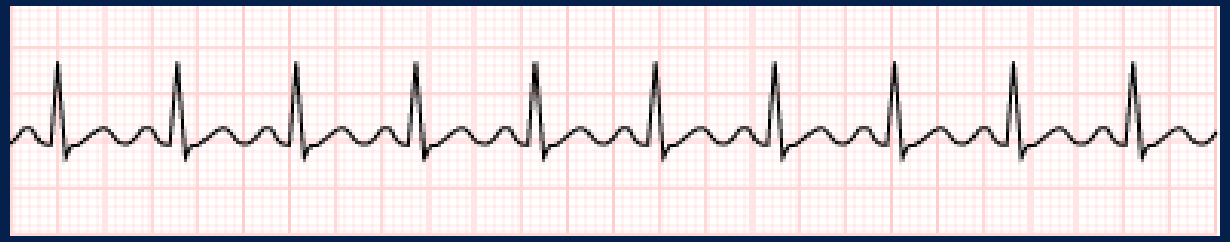
-His symptoms included tremors, nausea, vomiting, and anxiety, which he had experienced during previous attempts at cessation of GHB.

Case presentation: physical examination

- The patient was awake, alert, and answering questions appropriately

- The physical examination was remarkable only for tachycardia and a mild tremor with his arms outstretched

- His heart rate upon presentation was 123 beats per minute, blood pressure was 156/98 mmHg, temperature 97.6ºC, respiratory rate 20 breaths per minute, and oxygen saturation of 95% on room air.



Case presentation: emergency department workup and treatment

-The patient had a medical workup including an electrocardiogram significant only for sinus tachycardia and basic labs.

-He was found to have an elevated ALT (49 U/L) and AST (38 U/L).

-His white blood cell count and creatinine were within normal limits.

-His urine toxicology was positive for benzodiazepines and amphetamines.

-His serum ethanol level was undetectable.

-He was treated with intravenous fluids and diazepam 5 mg IV. With IV fluids and the diazepam as above, his heart rate trended down to 97 beats per minute. He was admitted to the inpatient detoxification unit.

The first 24 hours after last GHB use

-The patient's vital signs were within normal limits by the next morning, approximately 12 hours after his last use of GHB.

-The patient was started on a diazepam taper 10mg orally (scheduled for q4 hours) and received 2 doses, but further doses were not given initially due to concern that the patient was overly sedated in the morning with difficulty answering questions without falling asleep mid-sentence. Other than fatigue, the patient was answering questions appropriately and had no complaints.

The first 24 hours after last GHB use: fulminant withdrawal

-In the afternoon, 16 hours after the patient's last use of GHB, the patient's heart rate increased to 100 beats per minute, and he developed severe tremors in the extremities even with his arms not extended. The patient became confused, agitated, and developed paranoia that someone was waiting for him outside the door. The patient was treated with an additional 50 mg of Librium orally, 10 mg of diazepam orally, 2 mg of Ativan IM, and baclofen 10 mg q8 hours.

-Despite this treatment, the patient's heart rate and tremors worsened, with a maximum heart rate of 152 beats per minute at 24 hours after his last GHB use with a blood pressure of 147/95 mmHg. Further laboratory testing was ordered including creatine kinase due to concern for rhabdomyolysis, and his creatine kinase was found to be elevated at 6099 U/L with a normal serum creatinine, which was treated with IVF. The patient was started on diazepam IV 10 mg q15 minutes PRN.

24 to 48 hours after last GHB use: improving symptoms

-The patient was started on a 4-day chlordiazepoxide taper starting at 50mg q6 hours with continuation of the PRN diazepam orally and IV for withdrawal symptoms with a plan to escalate to phenobarbital and/or continuous infusions of dexmedetomidine, propofol, benzodiazepines and transfer to the ICU if needed.

-From hours 24 to 48 after his last GHB use, he received 200 mg of chlordiazepoxide, 3 doses of baclofen 10 mg, 50 mg of diazepam IV via PRN dosing, and 5 mg of diazepam orally via PRN dosing. He also received clonidine 0.1 mg and olanzapine 5 mg IV for agitation as well as thiamine, folate, and a multivitamin for nutritional support. He did not require phenobarbital or continuous intravenous infusions of sedatives.

-By the time of the assessment at 41 hours from his last GHB use, his vital signs had returned to within normal limits.

-His laboratory testing showed down-trending creatine kinase and uptrending AST and ALT (70 and 46 IU respectively).

-The patient still had mild confusion and faint tremors in the extremities, but he was able to hold a conversation with the physician and answer most questions appropriately. The patient requested to go home to continue treatment as an outpatient but was encouraged to stay inpatient.

Case conclusion

- By day 7, the patient was no longer requiring benzodiazepines PRN. The patient expressed that he no longer wanted to take prescription benzodiazepines. He was informed that a longer-term benzodiazepine taper may be recommended and that he could follow up closely as an outpatient for arrangement for protracted benzodiazepine withdrawal symptoms. The patient was also offered long-term medications for protracted GHB withdrawal through the outpatient addiction institute. He declined inpatient rehabilitation and preferred to follow up as an outpatient. He was discharged with a plan for close addiction medicine follow-up and group therapy through the “Crystal Clear” group, a group for LGBT+ men with methamphetamine and other substance use.

One month phone follow-up

Reported symptoms	Patient quote
Fatigue	“I was at a meeting, and I just fell asleep. I’m mentally and physically exhausted.”
Insomnia	“[Insomnia] is getting better.”
Motor/coordination difficulties	“I just drop stuff [referencing a pen]. It just scares me.”
Cognitive difficulties	“Processing information is difficult.”
Retrograde amnesia	“I don’t remember anything about those days [during his hospitalization]. I don’t remember you [being his physician]. Apparently I was trying to convince my best friend to bring me drugs.”

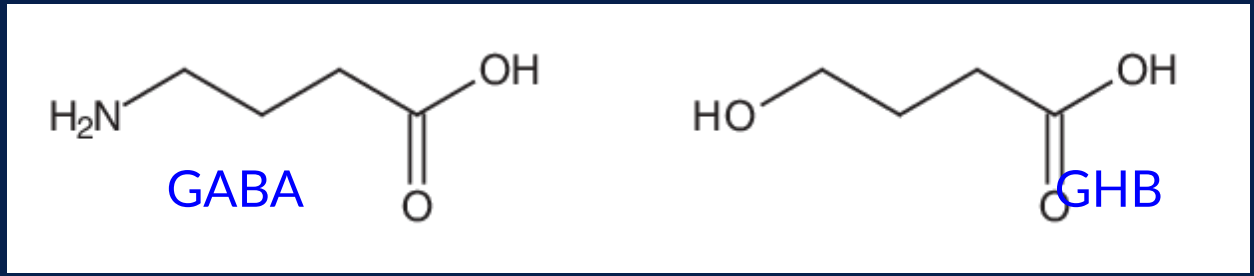
-The patient reported that overall his symptoms had been improving since discharge, and he had been attending self-help groups but had not followed up with our facility for medication management or therapy.

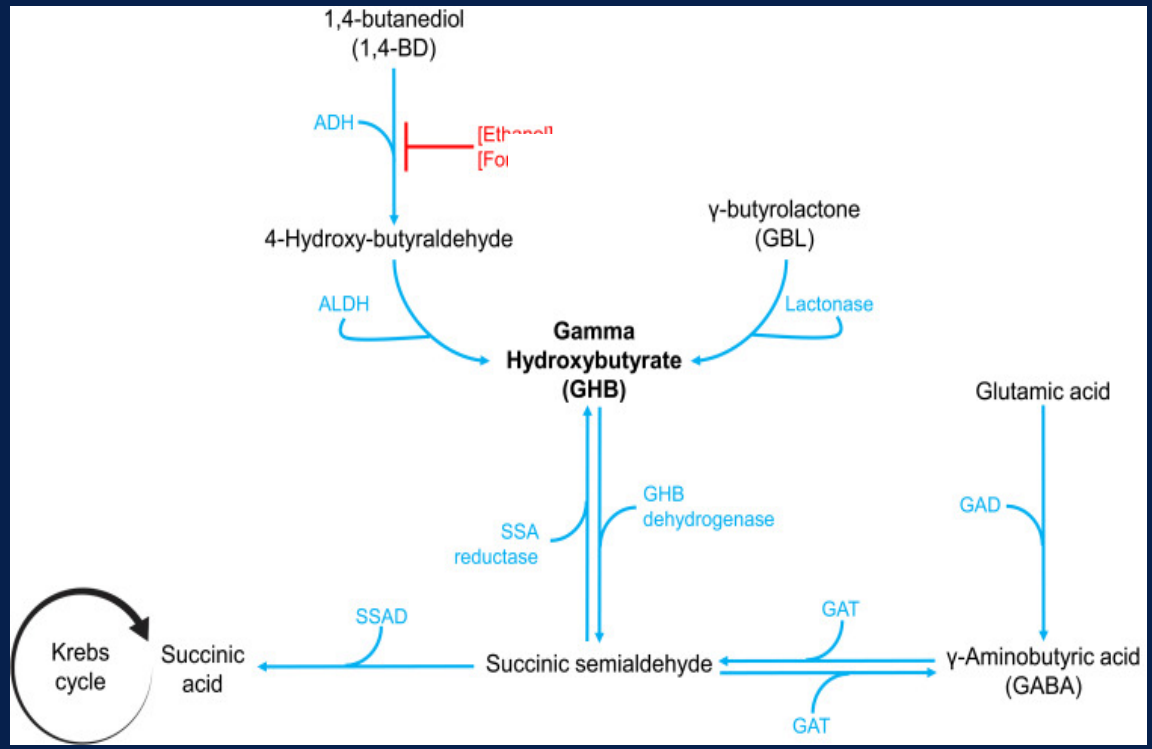
Gamma-hydroxybutyrate: a review

GHB biochemistry

-Gamma-hydroxybutyrate (GHB), or its precursors gamma-butyrolactone (GBL) and 1,4-Butanediol ("BDO"), is an endogenous compound that is a gamma aminobutyric acid (GABA) analog. It differs from GABA in that it has a hydroxyl group instead of the amino group on the GABA molecule.

-Endogenous GHB is synthesized from GABA, and GABA is synthesized from glutamate. GHB has significant first-pass metabolism via the liver. The Krebs cycle degrades most of GHB and forms of succinic semialdehyde and succinic acid. GHB is also in part metabolized to a much smaller degree via GABA transaminase into GABA. Thus, GHB is both a prodrug and metabolite of GABA.





Source: Tay E, Lo WKW, Murnion B. Subst Abuse Rehabil. 2022;13:13-23

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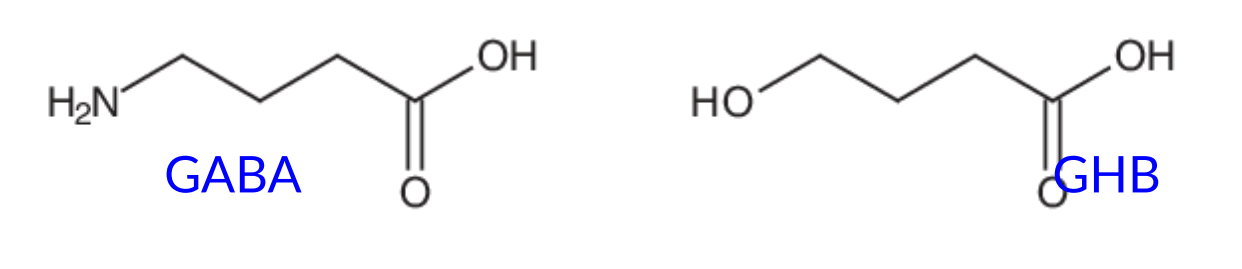
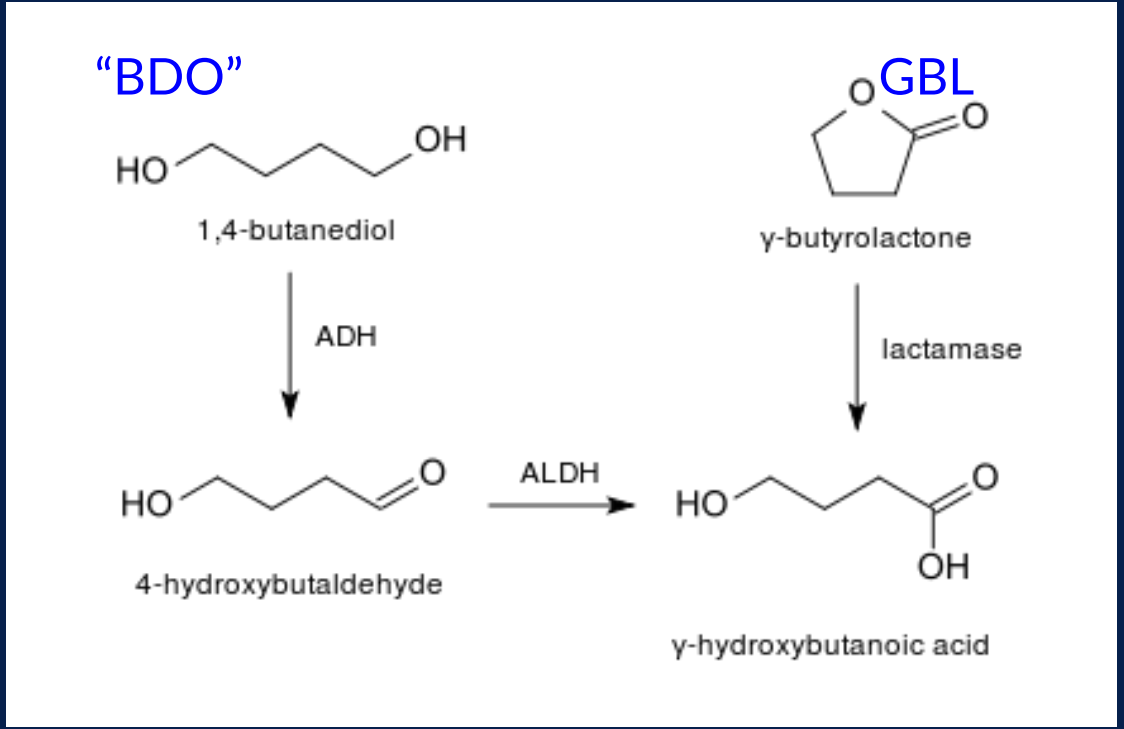




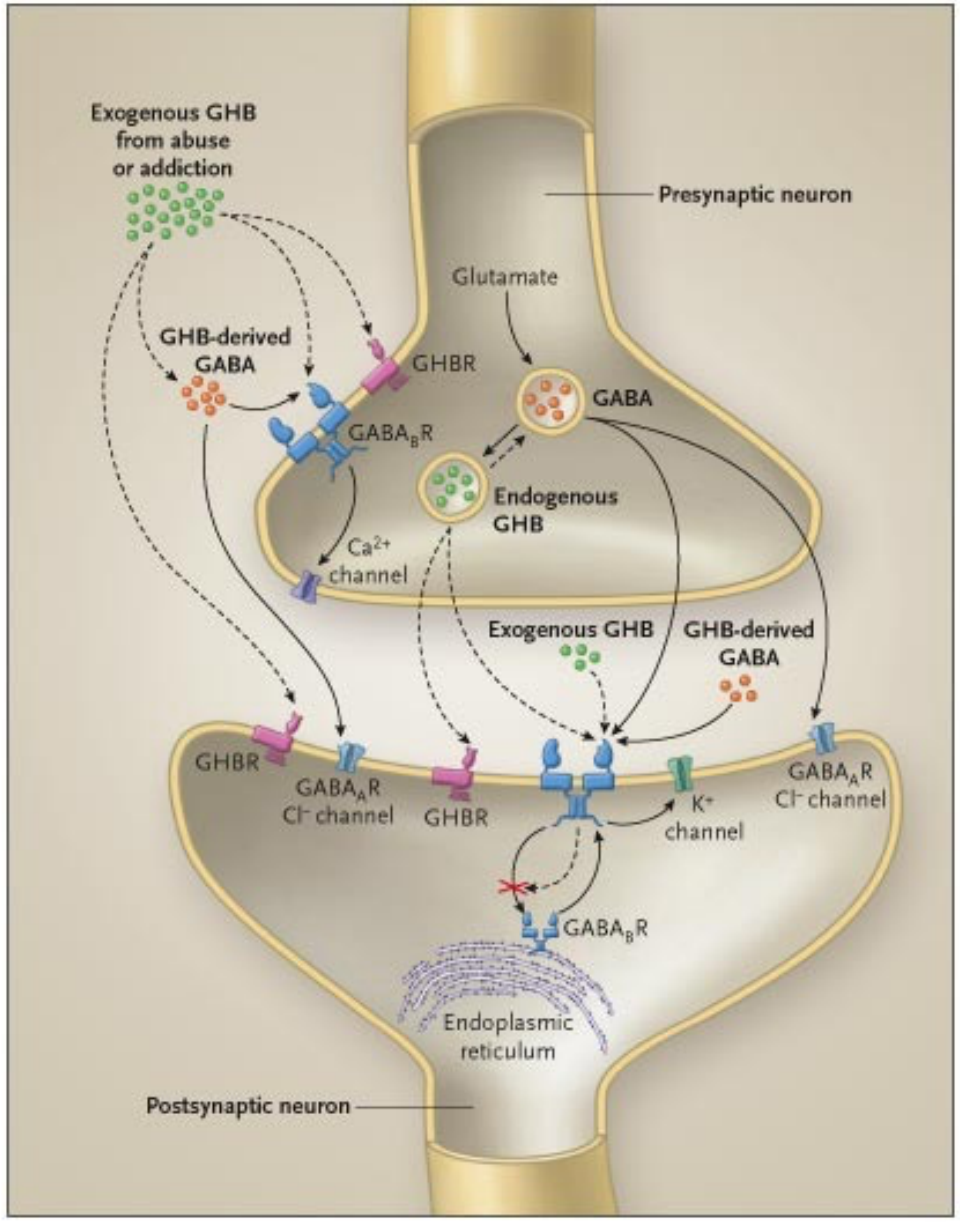
Source: Tay E, Lo WKW, Murnion B. Subst Abuse Rehabil. 2022;13:13-23

GHB biochemistry

-GHB binds with high affinity to GHB receptors (excitatory effect) and with weak affinity to GABA-B receptors. New research also shows that it may bind with high affinity to the α4βδ subtype of the GABA-A receptor (although conflicting evidence in studies).

-Endogenous levels of GHB do not have significant GABA-B receptor binding, and the effects are primarily on the GHB receptor, whereas exogenous high doses causes more GABA activation.

-Chronic exogenous GHB causes downregulation of GABA-B receptor and GHB receptor, but to a small or no extent downregulation of the GABA-A receptor.



Source: N Engl J Med 2005; 352:2721-2732

GHB use

-Gamma-hydroxybutyrate (GHB) is clinically important both in overdose and withdrawal

-The time to reach peak plasma concentration is rapid, and **the elimination half life of 20-40 minutes**, which is why patients who overdose can have rapid improvement in symptoms (i.e., the classic GCS 3 to self-extubation transition). A dose-dependent mixed stimulant/sedative effect has been described, with stimulant and euphoric effects predominating early in the time course followed by the sedative effect.

-The amount ingested is usually measured in mL with a typical concentration of 1 g/mL, but the concentration varies making quantification difficult. Some people quantify in “eye droppers,” e..g, 1 mL worth each).

GHB use

-GBL and BDO are **highly emetogenic** solvents that are also sold as industrial cleaners and come in liquid form (sometimes mixed with other drinks such as juice to reduce emesis), whereas GHB can be in salt or liquid form.

-Pro-drugs can be taken directly or easily synthesized into GHB, e.g., GBL + water + NaOH, which is an exothermic reaction.

-These used to available over-the-counter in vitamin stores and gyms in the 1990s, but increased regulation has led to online acquisition. E.g., one patient bought GBL on Amazon several years ago.

GHB use

-Recreational GHB (aka “G,” Gina, Liquid Ecstasy) has regional variations in use, with increased use noted in England, Ireland, and the Netherlands, as well as the United States in cities such New York City, San Francisco, and Miami particularly in nightclubs and parties by men who have sex with men due to its anxiolytic and strong euphoric effects, and sexualized drug use/“chemsex” with frequent co-ingestants in this population include alcohol and methamphetamine

-For example, one patient described its effects as “alcohol, but it only lasts one hour without the hangover” and another “like the first time taking Adderall”

-Other unprescribed uses: self-medication for insomnia, anxiety, and for bodybuilding (increases serum growth hormone even in the absence of sleep). It has also been used in sexual assault.

-Prescribed uses: GHB salt is available by prescription for narcolepsy, marketed as Xyrem or sodium oxybate (dual-scheduled I and III). It has also been used in Europe as a treatment for alcohol withdrawal.

GHB overdose: CNS and respiratory depression

-A dose-dependent mixed stimulant/sedative effect has been described, with stimulant and euphoric effects predominating early in the time course followed by the sedative effect. Co-ingestants such as **alcohol or benzodiazepines can increase sedation**.

-The time to reach peak plasma concentration is rapid, and the typical **elimination half life is less than 60 minutes**, which is why patients who overdose can have rapid improvement in symptoms (i.e., the classic GCS 3 to self-extubation transition). Activated charcoal is not recommended due to rapid absorption of GHB.

-GHB testing is frequently via a send-out lab, and it takes around 7 days to result.

-Treatment is supportive care with close monitoring of respiratory status. Based on clinical evaluation, consider EtOH, glucose, APAP, ASA level, EKG, CT head. Don't anchor! Consider screening for assault (sexual or physical).

-Monitor for symptoms of GHB withdrawal

GHB use disorder and withdrawal

-Due to its short half-life, users who develop a substance use disorder develop use multiple times per day, often waking up at night to ingest more GHB, and am inability stop GHB due to withdrawal symptoms.

-Severe withdrawal is associated with **frequent ingestion** every 1 to 3 hours (e.g., one patient set a timer to re-dose every one hour and 35 minutes) and **waking up at night to ingest more**.

-Withdrawal symptoms include anxiety, tremor, tachycardia, vomiting, diaphoresis, and insomnia.

-In severe withdrawal patients sometimes experience initial improvement and then a precipitous worsening of symptoms that can mimic delirium tremens. Severe symptoms include **severe agitation, seizures, hallucinations, and delirium**. Vital sign derangements can include hypertension and tachycardia but are not typically as profound as when seen in delirium tremens. Rhabdomyolysis, renal failure, seizures, and death have been described from severe GHB withdrawal.

-The acute withdrawal duration is variable with ranges typically from 2 to 15 days.

GHB withdrawal: acute phase

-There are no randomized controlled trials of treatment of GHB withdrawal, but treatment by front-loading benzodiazepines such as diazepam both orally and intravenously is the most common approach.

-Additionally, gabapentin, propofol, dexmedetomidine, and phenobarbital for refractory withdrawal have been described (phenobarbital binds directly to the ion channel and can function without the GABA-A receptors alpha subunit). A treatment pathway identical to the treatment pathway for severe alcohol withdrawal can be used; e.g., front-loading with benzodiazepines and escalating to phenobarbital and then dexmedetomidine.

-Baclofen, due to its affinity for the GABA-B receptor, has also been described both as an adjunct for severe withdrawal or as a monotherapy for withdrawal. Baclofen is typically started at 10 to 25 mg TID and can be escalated. One case report started at 30 mg upfront and escalated to scheduled doses of 20–40 mg every 4 hours in addition to PRN doses of 20–40 mg q4h orally and then tapered over the course of 7 days.

-A taper of pharmaceutical GHB is routinely used in the Netherlands.

-Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) scoring is sometimes used for monitoring withdrawal and treatment, but it has not been validated for GHB withdrawal.

-There is anecdotal evidence that some people self-medicate with phenibut during withdrawal for similar GABA-B receptor effect, which unfortunately has its own withdrawal risk.

-Other non-medically-supervised strategies described online on drug forums such as Erowid and Bluelight include a self-taper of GHB, use of non-prescribed benzodiazepines, or pregabalin/gabapentin.

Possible mechanisms of withdrawal symptoms

Table 2. Possible neurological explanations for GHB withdrawal symptoms and signs

Withdrawal symptom	Possible main neurotransmitter effect
Auditory/visual hallucinations, paranoia	+ Dopamine
Tremors	+ Acetylcholine, serotonin
Tachycardia/palpitations	+ Acetylcholine, + noradrenaline
Hypertension	+ Noradrenaline
Sweating/hyperthermia	+ Dopamine, + noradrenaline, – serotonin
Anxiety	– GABA, + glutamate, – neurosteroids, fluctuating serotonin
Agitation/aggression	+ Serotonin, + glutamate
Pain	– Opioids
Insomnia/sleeping disorder	– GABA, + dopamine
Disorientation/delirium	+ Dopamine, + noradrenaline , – GABA
Depressive reaction	– Serotonin, – neurosteroids, GABA
Hypothermia/hyperthermia	+ Dopamine
Muscle contractions/convulsions	+ Acetylcholine, – GABA

+ = Increase; – = decrease/inhibition.

Kamal et al., 2016

GHB withdrawal: protracted withdrawal

-This patient's persistent but improving symptoms one month after inpatient detoxification could be secondary to GHB withdrawal with components of protracted benzodiazepine and methamphetamine withdrawal.

-Protracted withdrawal symptoms from GHB may occur lasting 3-6 months following detoxification including impaired cognition and memory, anxiety, depression, tremor, severe insomnia, and motor symptoms possibly due to direct neurotoxicity.

-**Baclofen due to its GABA-B mechanism is sometimes prescribed for protracted GHB withdrawal,** but it has the potential for misuse. It is typically weaned over weeks as an outpatient if it is used for protracted GHB withdrawal.

-GHB use disorder has **a high relapse rate of 60% within three month** following detoxification. Close outpatient monitoring after detoxification is recommended with:

-therapy including group or individual therapy

-medical management of protracted withdrawal symptoms

-treatment underlying conditions such as insomnia or anxiety

Practice Questions

Practice questions

A 33-year-old male with a history of GHB use disorder presents in acute withdrawal with a heart rate of 125 and a blood pressure of 134/96. His last use was 2 hours prior, and he has been using 3 mL of GBL every 2 hours. He has a history of requiring an ICU stay in the past for GHB withdrawal. What do you use to treat him as a first-line? What adjuncts would you consider?

Key points

-Both GHB overdose and GHB withdrawal can be life-threatening.

-Patients who ingest GHB frequently throughout the day or wake at night to ingest more are at high risk for severe withdrawal.

-GHB withdrawal has clinical similarities to alcohol withdrawal. Severe agitation, seizures, hallucinations, and delirium can occur in severe withdrawal.

-GHB withdrawal is typically treated with benzodiazepines such as diazepam, but medications used in alcohol withdrawal treatment have been described including phenobarbital. Baclofen, a GABA-B receptor agonist, can be added as an adjunct or has been used as a monotherapy.

-Protracted withdrawal is common lasting three to six months, and baclofen has been used to treat cravings and relapse prevention. Close outpatient monitoring is recommended.

-There have not been studies on medications for alcohol use disorder such as acamprosate or gabapentin for cravings or relapse-prevention for GHB.

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Harm Reduction in Sexualized Substance Use

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Slides courtesy of Jenna Butner, MD, MPH
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Case presentation: history

Sam, transgender female, age 28, engages in sexualized drug use ("chemsex") on weekends:

- Primary substances: methamphetamine and GHB
- Multiple sexual partners: cisgender males, occasionally transgender females
- Inconsistent condom use
- Reports feeling “invincible” without the need to eat or drink when using substances
- Difficulty negotiating safer sex practices when under the influence of substances

Key Signs and Symptoms

Behavioral

- Decreased inhibition leading to higher-risk sexual practices
- Impaired decision-making
- Extended sexual sessions increasing tissue damage risk
- Multiple partners in group settings

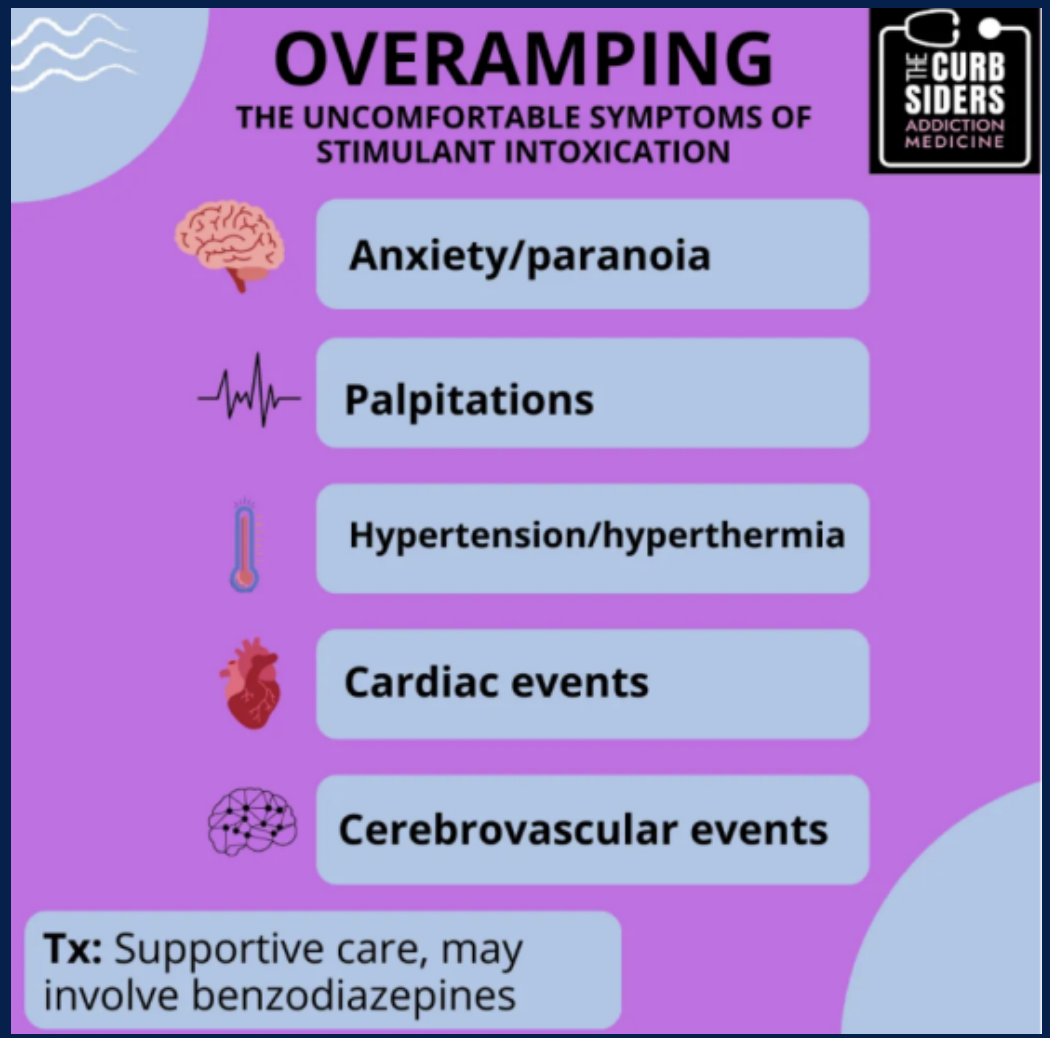
Physiological

- Increased blood pressure and heart rate
- Dehydration
- Tissue inflammation and micro-abrasions

https://circuitpartyinfo.com/

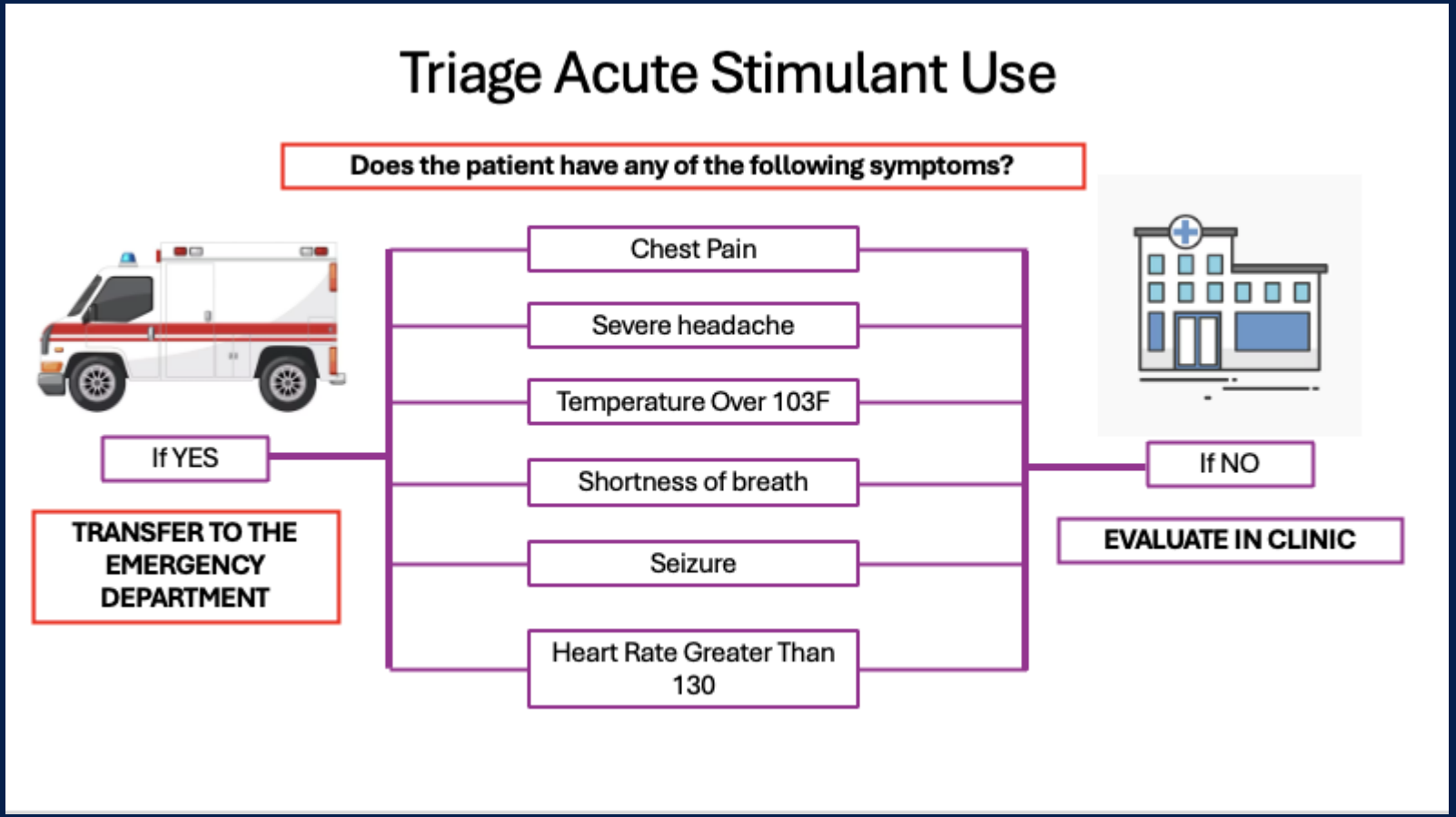
Overamping

- Terminology: describes what is considered to be an “overdose” of stimulants
- Symptoms: tachycardia, extreme anxiety, overheating, chest tightness or pain, nausea, and extreme agitation and paranoia
- Severe effects: heart attack, seizures, stroke, or psychosis



Huxley-Reicher, *Curbsiders Podcast*, 2022

Triaging overamping



Referenced from START handout

Post Overamping

1. Eat, Stay Hydrated
2. Avoid
3. Stay Away
4. Self-Check in
5. Find help

Evidence-based Harm Reduction Strategies

STI Prevention Measures

- Regular HIV/RPR/Gonorrhea/chlamydia screening
- PrEP (Pre-Exposure Prophylaxis) for HIV prevention
- Readily available condoms and lubricants
- Dental dams and other barrier methods
- Doxy post-exposure prophylaxis (PEP) awareness
- Multisite testing

Substance Use Safety

- Drug checking services
- Obtain thorough history
- Naloxone availability
- Measured dosing
- Hydration monitoring
- Safe injection and inhalation practices

Community-Based Interventions

- Non-judgmental healthcare services
- Peer support programs
- Mobile testing units at relevant venues
- Educational resources in appropriate settings
- Crisis intervention services

Consent and Communication

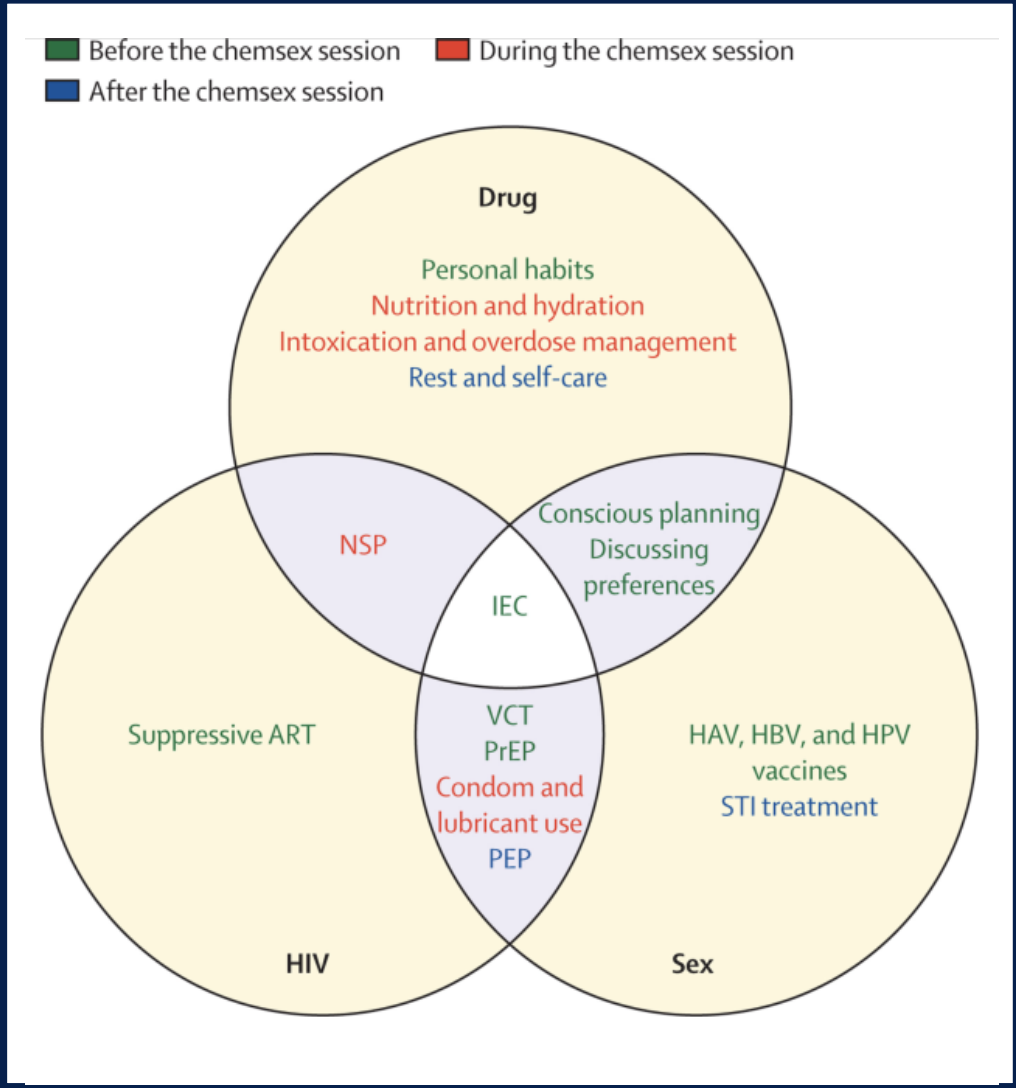
- Pre-session boundary discussion
- Regular check-ins during sessions
- Established safe words/signals
- Clear communication

Harm reduction Venn Diagram

VCT – voluntary counselling and testing

NSP = needle and syringe program

IEC = information education and communication



(Strong et al, *The Lancet HIV*, 2022)

Case presentation #2

Adrian, cisgender male, age 34, who works in high-stress corporate environment, attends weekend circuit parties

- Primary substances: MDMA, ketamine, cocaine, alcohol
- Sexual partners: cisgender males, uses condoms, takes unprescribed sildenafil
- Reports increasing frequency of use over the last few months
- No regular primary care provider due to concerns over anonymity and stigma
- Has an upcoming performance evaluation that he is worried about

High Risk Behaviors and Outcomes

- Multiple substances used without drug checking
- Combining erectile dysfunction medications with stimulants
- Extended party sessions (48-72 hours)
- Irregular eating and sleeping patterns
- Avoiding medical and mental health care
- Large group settings with unknown participants
- Financial strain
- Work performance concerns

Evidence-based Harm Reduction Strategies

Venue Safety

- Trusted location with proper ventilation
- Access to sterile water and electrolyte drinks
- Clear exits and emergency contacts visible
- First aid supplies readily available

Personal Protection Items

- Various barrier protection options
- Personal lubricants (water and silicone-based)
- Basic first aid items
- Emergency contact information
- Naloxone kit

Preparation

- Supply of various protection barriers
- PrEP adherence if prescribed
- Sterile sex toys and proper cleaning supplies
- Personal hygiene supplies

Case presentation #3

32-year-old male presented to the ED with severe hypoxia (O2: 75%) after first time use of Super RUSH purchased at a local gas station. Unable to provide information of how the substance was used.

Clinical: cyanosis, dizziness, tachycardia, methemoglobinemia

Treatment: supportive: oxygen supplementation and monitoring, methylene blue IV

Harm Reduction Practices: “Poppers”

- Route: Inhalation only, from safe distance (never swallow or ingest).
- Use well ventilated areas
- Avoid: PD-5 Inhibitors, alcohol
- Product safety: sealed, check for signs of degradation (brown, strong smell)
- Usage: space out to allow recovery, small amounts, use with someone else

Community Resources and Digital Tools

Healthcare Access

- LGBTQ+ centered healthcare providers

  https://lgbtqhealthcaredirectory.org/

- Substance use treatment

  https://findtreatment.gov/

- Mental health professionals

  https://growtherapy.com/start/get-therapy/

  https://www.psychologytoday.com/us/therapists

Peer Support

- Community outreach programs
- Harm reduction organizations
- Support groups
- Online communities

Digital Tools

- Drug interaction checking apps

  https://stashid.org/

- Emergency contact apps
- Location sharing with trusted contacts
- Crisis hotline information

  https://www.samhsa.gov/find-help/helplines/national-helpline

  https://www.apa.org/topics/crisis-hotlines

Chemsex Harm Reduction

Key Takeaways

- Overamping is a concern with stimulant use
- Recognize and assessing overamping is key
- Harm reduction strategies in chemsex are effective and should be promoted
- Interventions should be accessible, personalized, and non-judgmental

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Rapid-fire multiple choice questions

Practice questions

Which of the following is FDA-approved for stimulant use disorder?

A. mirtazapine
B. topiramate
C. methylphenidate
D. bupropion
E. none of the above

Practice questions

Which of the following is NOT a common substances used in chemsex and sexualized drug use?

A. GHB
B. methamphetamine
C. ketamine
D. anabolic steroids
E. mephedrone
F. MDMA

Practice questions

Which of the following is colloquially known as “poppers”?

A.Nitrous oxide

B.Alkyl nitrites

C.Mephedrone

D.Methamphetamine

E.MDMA

Practice questions

Withdrawal from which of the following can appear similar to alcohol withdrawal (tremors, tachycardia, agitation, seizures, etc.)?

A. GHB
B. methamphetamine
C. ketamine
D. mephedrone

Practice questions

Which of the following receptors may GHB bind to?

A. GABA-A
B. GABA-B
C. GHB
D. All of the above

Practice questions

Which of the following has evidence toward use for relapse prevention for GHB use disorder?

A.Naltrexone

B.Acamprosate

C.Baclofen

D.Diazepam

Final Takeaways/Summary

-The landscape of chemsex and sexualized drug use is changing in the information age, and in patients seeking treatment this should be explored

-Both GHB overdose and GHB withdrawal can be life-threatening

-Baclofen can be added as an adjunct or has been used as a monotherapy for GHB withdrawal as well as for relapse-prevention

-Harm reduction key principles:

- STI/HIV screening
- Knowledge of prevention: PrEP, PEP, condoms and lubricants
- Usage methods mitigating unintended outcomes
- Peer support, digital tools, LGBTQ-specialized treatment programs