

BATH SALTS & BEYOND: STIMULANTS & DESIGNER DRUGS 2019

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Objectives

- Identify stimulants and designer drugs, including methamphetamine, methylenedioxymethamphetamine (ecstasy), and cathinones (bath salts).
- Recognize clinical clues to use of stimulants and designer drugs.
- Discuss treatment of complications resulting from use of stimulants and designer drugs.

Case Presentation

- 25 y/o man dropped off at ED by his friends
- VS: BP 135/95, HR 110 bpm, RR 20/min, temp 100.2°F
- Does not want to stay because he thinks the ED staff are zombies that will try to eat his flesh
- Admits to using a drug earlier that evening
- Becomes agitated and refuses to answer any more questions

Case Presentation continued

- Result of rapid urine drug screen is negative
- Gradually patient becomes less paranoid
- A packet containing white powder falls out of his pocket onto the stretcher
 - Patient reports, "That belongs to my brother."
- Which drug was most likely used by this patient?

Abused Stimulants



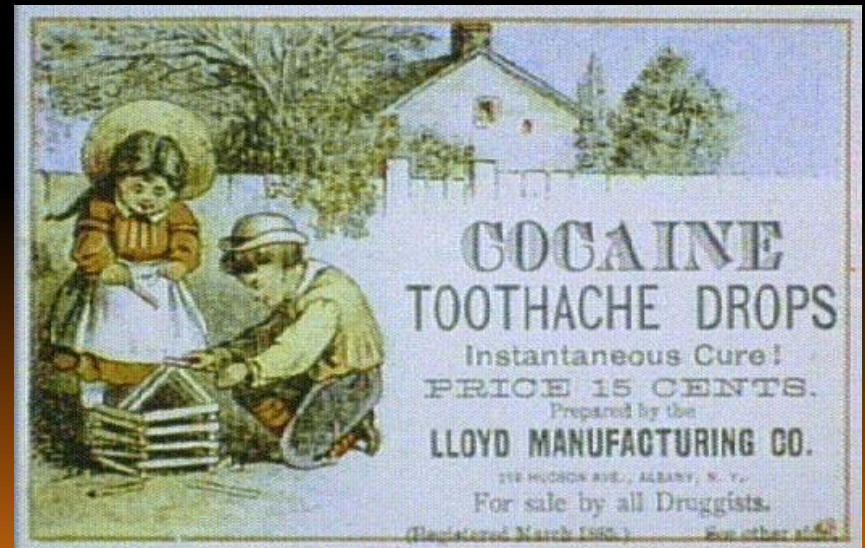
- Amphetamine
- Methamphetamine
- Cocaine
- Ecstasy
(methylenedioxy-
methamphetamine)
- Sudafed
(pseudoephedrine)
- Khat (cathinone)
- Methcathinone

Mechanisms of Action

- Bind to dopamine transporter (reuptake pump) on presynaptic neuron and reverses pump
- Increase release of excitatory neurotransmitters from intracellular vesicles
- Inhibit monoamine oxidase in synaptic cleft
- Cocaine simply blocks dopamine transporter

Therapeutic uses

- Attention deficit disorder
 - Methylphenidate (Ritalin), amphetamine salts (Adderall)
 - Enhance focus
 - Alternatives
 - Atomoxetine (Strattera), bupropion, guanfacine (Intuniv)
- Narcolepsy
- Weight loss
- Refractory depression
- Decongestant (Sudafed)
- Local anesthetic (cocaine)



Prescription Stimulants

- Benzedrine (amphetamine)
- Dexedrine (dextroamphetamine)
- Adderall (amphetamine + dextroamphetamine)
- Ritalin (methylphenidate)
- Preludin (phenmetrazine)
- Desoxyn (methamphetamine)
- Vyvanse (lisdexamfetamine)



Other uses of stimulants



- “Smart pills”
 - Late-night studying
 - College students

- “Truckers”
 - Long-distance driving
 - Truck drivers



Methamphetamine

- Potent, long-acting stimulant
- Route of administration
 - Oral
 - Intranasal
 - Smoke
 - Inject
- Synthesized in clandestine labs directly for illicit use
- 14.5 million adults in U.S. have used methamphetamine
 - 5.4% of population
- Nearly 1 million current users in U.S.



Street Names of stimulants

- Speed, Crank, Meth
- Crystal meth, Ice
- Ecstasy (MDMA), Adam
- Eve
- The love drug
- STP (serenity, tranquility, & peace)
- Uppers
- Bennies, Dexies
- Black Beauty
- White Crosses
- Vitamin R, rits
- Pep pills
- Cat



Usage & Dosages

- Users may start with oral route
 - Low risk, but less 'rush'
- Intranasal insufflation (snorting, sniffing)
- Most dangerous
 - Smoking
 - Injection (especially intravenous)
- Users average 1-7 binges per week
 - Each lasts 4-24 hrs
 - May readminister every 10-30 min
 - 'run,' 'spree'


Psychotic Manifestations of Stimulants

- Hallucinations
 - “snow lights” (visual)
 - “crank bugs” (tactile)
- Paranoid delusions
- Psychosis
- Worsen panic attacks
- Exacerbate schizophrenia




Effects of chronic use

METH = DEATH



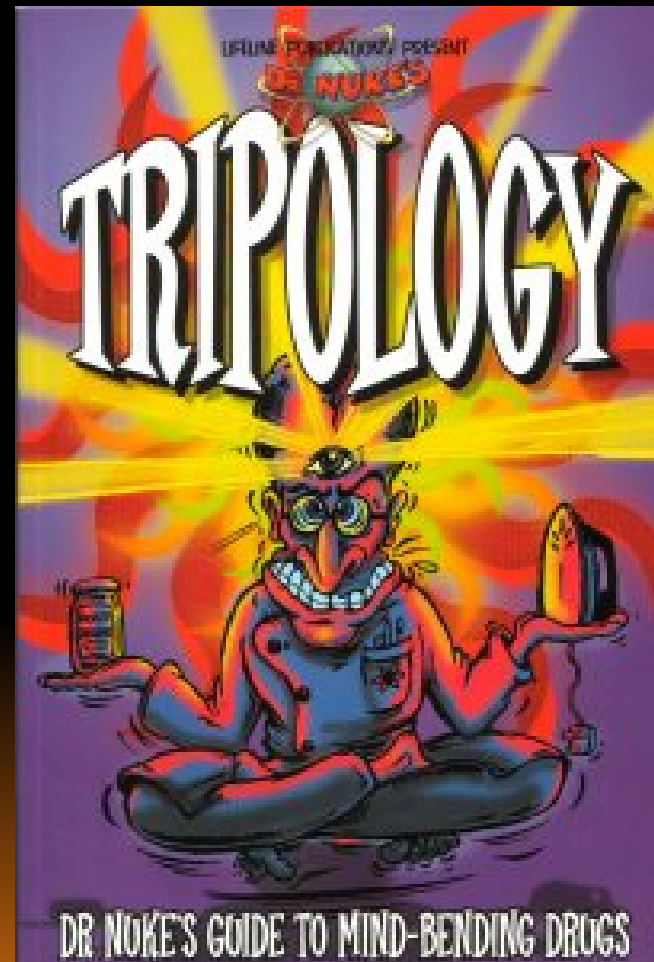
tooth decay - respiratory distress - skin lesions
impotence - stroke - suicidal tendencies - self-destructiveness
high risk sexual behavior - paranoia - psychotic episodes - coma
convulsions - violent episodes - HIV/Hepatitis/Syphilis - hair loss
CARDIAC ARREST

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- ↑ startle reflex
- Parkinsonism
 - athetosis
 - chorea
- accelerated atherosclerosis
 - ischemic stroke
 - heart attack
- cardiomyopathy

Designer Drugs

- Variety of compounds that change with time to avoid detection and legal authorities
- Use by young adults
- Attractive packaging
 - Entice younger users
 - Colorful names



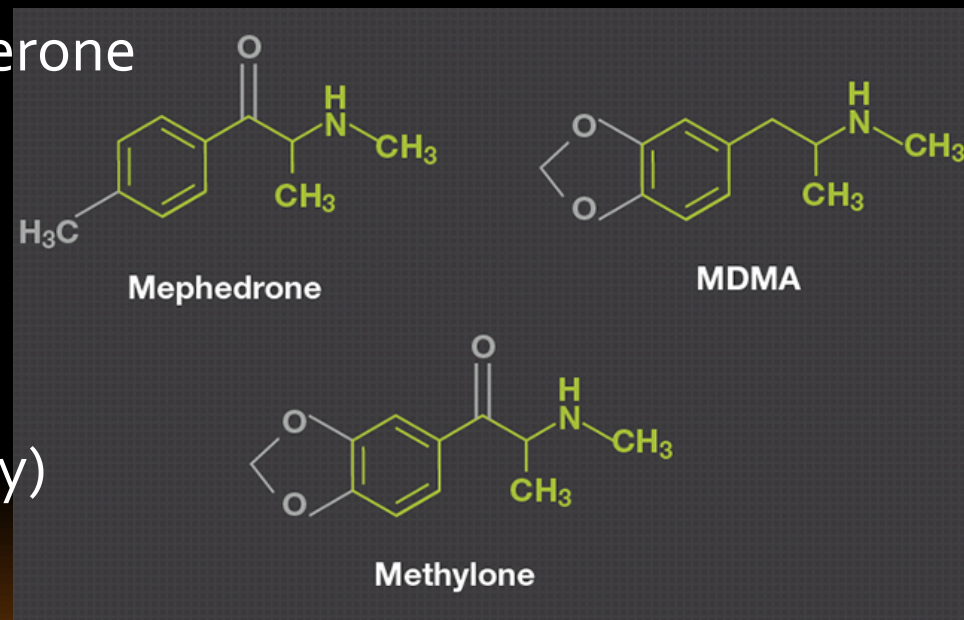
“Bath Salts”



- Designer stimulants
 - Newer versions of older stimulant drugs
- Colorful names
 - Ivory Wave, Vanilla Sky
- Labeled “not for human consumption”
 - Not actually sprinkled into bathtub water
 - Snorted or smoked

Pharmacology of bath salts

- Synthetic derivatives of cathinone (khat)
 - Methylenedioxy-pyrovalerone (MDPV)
 - Mephedrone, methylone
- Potent stimulants and hallucinogens
 - Similar to MDMA (Ecstasy)
- ↑ excitatory neurotransmitters
 - Dopamine, norepinephrine
 - Serotonin



Flakka



- Newest “bath salt” cathinone derivative
 - Alpha-PVP
- Also known as ‘gravel’
- Spanish for “charming woman”
- Inexpensive
- Similar serious cardiac and psychotic effects
- Found in Florida, Texas, and major U.S. cities

Acute clinical effects

- Very similar to other stimulants
 - ↑ energy, euphoria
 - ↑ alertness, concentration
 - ↓ appetite
- Duration of effects
 - Start in 10-20 min
 - Peak at 45-90 min
 - Lasts 2-3 hours



Physiologic effects

- Deaths have been reported with mephedrone and MDVP



- Diaphoresis
- Muscle tension
 - Spasms
 - Bruxism (jaw clenching)
- Tachycardia, arrhythmias
 - Palpitations
- Hypertension
- Hyponatremia
 - Similar to MDMA (Ecstasy)
 - Sweating, electrolyte loss
- Acidosis, rhabdomyolysis, acute renal failure

Psychiatric effects

- Acute agitation is a hallmark of toxicity
- Psychosis
 - Paranoia, delusions
 - Hallucinations
 - Primarily visual
- Tolerance
- Withdrawal
 - Depression
 - Irritability
 - Difficulty concentrating
 - Cravings



“Bath salts” use

- 127 different compounds
- “Flakka”/ “gravel”
 - Alpha-PVP
 - Equipotent to methamphetamine
 - 2nd most prevalent bath salt seized in U.S.
- 50-68% testing (+) denied knowingly using
- 80 deaths in Florida 2014-2015
- 100 deaths in Europe
- 1% of high school seniors used in 2018
- Risk factors
 - Homeless
 - Not residing with parents
 - Low SES
 - Use of other drugs

Diagnostic Challenges of Designer Drugs

- Not detected on current drug screens
- Products change fairly quickly
 - Evade legal restrictions
 - Avoid positive drug test
- Many different 'brand' names
- Contents and concentration vary widely



Is this patient using a Designer Drug?



- Ask about drug use
 - Know common street names
- Urine drug testing
 - Polysubstance use is the norm
 - Negative test doesn't rule out designer drug use
- Packages, paraphernalia
 - Send substance to lab

Treatment of intoxication

- Verbal reassurance
- Benzodiazepines for agitation, anxiety
- Try to avoid antipsychotics
 - Lower seizure threshold
- Most nonpsychiatric symptoms resolve in 1-3 days
 - Supportive care
- Cardiac monitoring
 - Arrhythmias
 - Hypertension
- IV fluids



Psychiatric Manifestations



- Psychiatric consultation
- May require prolonged inpatient treatment of psychosis
- Psychiatric symptoms that persist >1 week
 - May be co-occurring primary psychiatric disorder

Pharmacologic treatments for stimulant addiction

- Desipramine
- Imipramine
- Monoamine oxidase inhibitors
- Fluoxetine
- Trazodone
- Haloperidol
- Flupenthixol
- Lithium
- Methylphenidate
- Levodopa
- Bromocriptine
- Amantidine
- Carbamazepine
- Valproate
- Mazindol
- Naloxone
- Buprenorphine
- Methadone

Many tried, none effective

Possible new combination?

- Accelerated Development of Additive Pharmacotherapy Treatment (ADAPT) for Methamphetamine Use Disorder
- Sponsored by National Institute on Drug Abuse Clinical Trials Network (NIDA CTN)
- High-dose bupropion
 - 450 mg orally daily
- High-frequency naltrexone injections
 - Every 3 weeks
- 400 subjects with daily methamphetamine use
- Multiple sites throughout U.S.
- Just completed, awaiting data analysis

Treatment of Stimulant & Designer Drug Addiction



- Mutual-help groups
 - 12-Step (Narcotics Anonymous)
 - SMART Recovery
- Behavioral counseling
 - Individual
 - Facilitated groups
- Family therapy
- Intensive outpatient
- Residential

Summary

- Many different types of stimulants and routes of administration, but all have similar effects on user
- Stimulants 'rev up' the body and mind
- Designer drugs are more potent synthetic versions of existing drugs (amphetamines, hallucinogens)
- Doesn't show up on usual urine drug tests
- Intoxication may require hospitalization
- Watch out for serious adverse events
 - Seizures, arrhythmias, severe psychosis
- Treatment doesn't end with stabilization of the acute crisis
 - Refer for addiction treatment
- Different types of addiction treatment available, which are successful and cost-effective

References

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Questions?

