Pills and Potions: You took what?

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Objectives:
• Identify past, current, and future trends in drugs of abuse
• Describe the basic pharmacology associated with current drugs of abuse
• Recognize common clinical presentations seen with drug abuse in the Emergency Department setting
• Identify effective treatment
• Identify past, current, and future trends in drugs of abuse

• Understand the basic pharmacology associated with current drugs of abuse

• Recognize common clinical presentations seen with drug abuse in the Emergency Department setting

• Identify effective treatment modalities for common toxidromes associated with drugs of abuse
Quiz Time!
Can you name the drug?
Name this drug?
Name this OTC drug commonly abused by teens
Drug Abuse Timeline

- **3500 BC** - Earliest reports of alcohol production

- **1884** - Sigmund Freud treats his own depression with cocaine. Describes “Exhilaration and lasting euphoria”

- **1889** - Dr William Halsted founds John Hopkins Hospital. Exemplary surgical career despite morphine dependence.

- **1903** - Coca Cola ingredient changed to caffeine from cocaine

- **1919 - 1933** Prohibition Era. Violent crime drops 67% once repealed.

- **1920** - US Dept of Agriculture encourages Americans to grow Marijuana as a profitable undertaking.

- **1971** - President Nixon calls Drug Abuse: America’s Public Enemy No. 1
Drugs of Abuse Trends

- 1920s - 1930s
  - Alcohol, Opiates
- 1950s - 1960s
  - Marijuana, Amphetamines, Psychedelics
- 1980s - 1990s
  - Cocaine, Crack, Ice
- 2000s
  - Methamphetamine, Prescription Opiates
- 2015
  - Designer Synthetic Drugs, Marijuana, Heroin
Drugs of Abuse Trends

- Online Sources:
  - Erowid, Bluelight, YouTube
- Synthetic drugs appearing at rapid rate
  - Many are “legal”
  - Undetectable on drug screens
Drug Terminology

- Shoot / Hit the main line
  - to inject a drug
- Skin Popping
  - to inject under the skin
- Shot gun
  - blow smoke from joint backward into another persons mouth
- Eight Ball
  - 1/8 ounce (3.5gm) of a drug (cocaine)
- Speedball
  - Heroine / Cocaine combo
- Freebase
  - inhaling fumes from drug heated on spoon
Current Trends in Drug Abuse
Bath Salts
3,4 - Methyleneedioxyxypyrovalerone (MDPV) & other Synthetic Cathinones
Synthetic Cathinones - aka “Bath Salts”

- Analogs of naturally occurring cathinones such as *Catha eludes* (khat). Khat is native to Yemen and eastern Africa where leaves are chewed.

- Common active ingredients are: MDPV, Mephedrone, Methylone, Naphyrone

- Marketed not only as bath salts but as plant food (“Bonsai Grow”), jewelry cleaner, and cell phone cleaner

- Packets labeled “not for human consumption”

- Synthetic Drug Abuse Prevention Act of 2012 made it illegal to possess, use, or distribute many of the chemicals (26) used to make bath salts and synthetic cannibus. Now labeled as Schedule I drugs.
Synthetic Cathinones - aka “Bath Salts”
MDPV, Mephedrone, Methylone, Naphyrone,

- MDPV is a powerful stimulant. Functions as a dopamine-norepinephrine reuptake inhibitor. Has properties similar to amphetamine, ecstasy, cocaine & LSD
  - **Physical**: tachycardia, hypertension, sweating, fever & seizures (sympathomimetic toxidrome) *(excited delerium)*
  - **Mental**: euphoria, increased alertness & awareness, anxiety, agitation, increased wakefulness and arousal, appetite suppression
- 4x the potency of *Ritalin* and *Concerta*
- Initially developed as a therapeutic treatment for chronic fatigue but caused problems of abuse & dependence
Synthetic Cathinones - aka “Bath Salts”
MDPV, Mephedrone, Methylone, Naphyrone,

- White or brown crystalline powder often sold in small plastic or foil packages. Also pills or capsules.
- Commonly taken orally or snorted.
  - Other routes include rectal, gingival, smoking, inhalation, and parenteral
- Onset of psychoactive effects: 10-45 minutes
- Duration: 2-6 hours depending on route
- No routine testing available
Summary of Effects

- Aggression
- Agitation
- Breathing difficulty
- Confusion
- Dizziness
- Extreme anxiety sometimes progressing to violent behavior
- Fits and delusions
- Hallucinations
- Headache
- Hypertension
- Increased alertness/awareness
- Increased body temperature, chills, sweating
- Insomnia
- Kidney pain
- Lack of appetite
- Liver failure
- Loss of bowel control
- Muscle spasms
- Muscle tenseness
- Vasoconstriction

- Nausea, stomach cramps, and digestive problems
- Nosebleeds
- Psychotic delusions
- Pupil dilation
- Renal failure
- Rhabdomyolysis
- Severe paranoia
- Suicidal thoughts
- Tachycardia
- Tinnitus
- Teeth grinding
Management Strategies:

- Symptomatic & supportive care
- Use physical restraints with caution
- Meds: Benzos, Propofol, Ketamine
  - Use caution with Haldol due to hyperthermia risk
- Aggressive cooling measures
- Assess for hyponatremia
- Avoid B-blockers
Cross-Dressing Man High on Bath Salts Kills Neighbor's Goat

Miami “Face Eater” May Have Been High On “Bath Salts”

Burglar high on bath salts breaks into family's home, puts up Christmas decorations
“Flakka” or “Gravel”
Alpha-PDP - (alpha-pyrrolidinopentiophenone)
Second Generation Synthetic Cathinone - “Bath Salts”
“Flakka” or “Gravel” aka - $5 Insanity

- White or pink, foul-smelling crystal rock form
- Eaten, smoked, snorted, injected, or vaporized
- Effects can include excited delirium, paranoia, aggression, rhabdomyolysis, hyperthermia, hallucinations
- Deaths reported from suicide, self-injury, heart attack
- Florida cases making Headlines
LOST UNICORN:

If found please stop doing drugs
Synthetic Cannabinoids
K2, Spice
Synthetic Cannabinoids
“Spice, K2, Spice Gold, Skunk, Yucatan Fire, Moon Rocks, Genie, Spicylicious”

- Consist of synthetic (designer) cannabinoid compounds mixed with dried, shredded plant material
  - Marketed as “safe” alternatives to cannabis (THC)
  - Structurally unrelated to THC and bind to CB receptors with affinity 50-800 times that of THC
- Developed in research labs to study neuronal receptors. Not tested for use in humans.
- Synthetic Drug Abuse Prevention Act of 2012 lists these compounds as Schedule I drugs.
Synthetic Cannabinoids
“Spice, K2, Spice Gold, Skunk, Yucatan Fire, Moon Rocks, Genie, Spicylicious”

- Most commonly smoked, occasionally ingested.
- Similar effects to cannabis, but often much stronger
  - Onset: 5 minutes, Duration: 3-12 hours
- Physical: tachycardia, hypertension, nausea, vomiting, seizures
- Mental: euphoria, altered mood/sensorium, anxiety, paranoia, hallucinations, psychosis
- No defined toxidrome
Management Strategies:

- Care is largely supportive
- Meds: Benzodiazepines & Antipsychotics for treatment of seizures and psychomotor agitation
- Long term effects unknown but thought similar to THC
  - cognitive deficits, decreased attention, verbal learning, and memory
- Withdrawal symptoms after long-term use:
  - sweating, tremor, GI symptoms, unrest, headache, nightmares
we choose not to sell synthetic cannabinoids

Δ⁹-THC, the psychoactive ingredient of marijuana

JWH-133, a synthetic, non-psychoactive cannabinoid which is selective for the CB₂ receptor
WARNING
DRUG USE
MAY CAUSE
MEMORY LOSS
OR EVEN
MEMORY LOSS
Butane Hash Oil - “Wax / Honey Oil”
Hash Oil

- Hash oil is a Cannabis product obtained by solvent extraction from Cannabis buds.
- Liquid butane passed through a tube with cannabis matter. Butane is then boiled off.
- THC content is 60-90%.
- Hash oil consumed by smoking, ingestion, or “dabbing”.
- Effects lasting up to 24 hours.
- Explosions and fires are risk with this drug use.
Marijuana Edibles
Name 5 drugs commonly abused drugs at a “Rave”
MDMA - “Molly” & “Ecstasy”
3,4-methylenedioxy-methamphetamine
MDMA
Ecstasy, Molly, Mandy, XTC

- Similarities to both stimulant Amphetamine and hallucinogen Mescaline
- Taken orally as capsule or tablet
- “Molly” refers to pure crystalline form of MDMA, indicating higher purity
- Increases activity of serotonin, norepinephrine, dopamine. Strong emotional & social effects from serotonin release.
- Drug effects generally last 3 - 6 hours
Ecstasy Tablets
Molly
MDMA

- Emotional Effects:
  - Heightened mood, sensitivity, emotional excitation
  - Depersonalization, altered sense of space & time
  - Synesthesia, increased feelings closeness & sexual arousal

- Physical Effects:
  - Hyperthermia, hyponatremia, tachycardia, hypertension
  - Bruxism

- Long-term neurotoxic effects: Depression, sleep disturbance, anxiety, attention and memory difficulty
MDMA

- Pills often contain other psychoactive drugs such as: methamphetamine, cocaine, DXM, ephedrine, caffeine and even bath salts

- Treatments:
  - IV hydration
  - Temperature control
  - Electrolyte monitoring
GHB: Gamma-Hydroxybutyrate

“Liquid X, Liquid ecstasy, Gamma-oh, Grevious bodily harm, G, Liquid G”
Which famous singer collapsed outside an LA nightclub in 1994 after using GHB?

Why did he collapse?
GHB
CNS depressant

- Naturally occurring metabolite of GABA neurotransmitter
- GHB synthesized for use as a general anesthetic, treatment of insomnia & narcolepsy, anabolic effects
- Classified as Club-drug or Date-rape drug
- Odorless, colorless drug in liquid form, often combined with alcohol
- Schedule I classification as of 2000
GHB

- **Positive Effects:**
  - Euphoria, sense of tranquility, induction of sleep
  - Prosexual: disinhibition, heightened senses, increased orgasm intensity

- **Negative Effects:**
  - LOC (69%), Hallucinations, N/V, confusion, amnesia

  **Titration of dosing is difficult. Response curve is steep.**

- **Onset:** 5-20 minutes with oral ingestion
- **Effects:** 1.5 - 6 hours
GHB

- Treatment Modalities for OD:
  - Get a good history from friends & family
  - Care is mainly supportive
  - Endotracheal intubation if airway protective reflexes are lost.
  - Be cautious with use of Narcan, can induce vomiting.
Ketamine

“Special K”, “K”, “Cat Valium”, “Vitamin K”
Ketamine
similar effects to PCP, DXM

- Dissociative anesthetic that has gained popularity as a drug of abused. Accepted use in medical and veterinary settings for anesthesia, pain management, treatement depression.

- NMDA receptor antagonist

- Schedule III controlled substance as of 1999.

- Distorts perceptions of sight and sound, produces feelings of detachment from oneself and the environment.

- Ketamine can be snorted, injected, mixed in drinks or smoked. Most abusers take small lines or “bumps” for a mild, dreamy effect.

- Used as a Club-drug and date-rape drug

- “Bump” of 100mg is usually enough for “K-hole” experience
Ketamine

Physical effects are dose dependent

- Lower Dosing:
  - Mild inebriation, dreamy thinking, clumsy, vertigo, nausea, “robotic movements”, sense of seeing world differently.

- Higher Dosing, “K-Hole”:
  - Detachment from surroundings and bodies with visual & auditory hallucinations, difficulty communicating, sense of movement through space, strange fabrics or textures, alternate plane of existence

- Emergence Reaction
  - Characterized by vivid dreams, hallucinations, delirium, agitation in 10-20% at anesthetic doses
Ketamine
Side Effects & Treatment Options

- Side Effects:
  - CV: Increased HR, Increased or decreased BP
  - GI: Nausea, Increased salivation
  - Ocular: Nystagmus, Diploplia
  - Respiratory: Apnea, Increased secretions, Laryngospasm
  - Muscular: Increased tone, tonic-clonic movements

- Treatment Options:
  - Benzodiazepines: Used for agitation and Emergence reactions
  - Anti-emetics: Vomiting not uncommon, related to nystagmus
- Does the patient have an airway? NO
- Is the patient breathing? NO
- Does the patient have adequate circulation? NO
- Does the patient have acute pain? YES
- Does the patient have chronic pain? NO
- Does the patient need a procedure? YES
- Is the patient agitated? NO
- Does the patient have Suicidal Ideation? NO
- Is the patient still in the waiting room? YES
Dextromethorphan - “DXM”

“Dexing, Robodosing, Robotripping”
“Dex, Skittles, Red Devils, Triple C”
Dextromethorphan - “DXM”

- Found in OTC cough & cold meds
- 6000 ED visits annually due to non-medical use
- Age 12-20 account for 50% of ED visits
- Common Agents: Coricidin, Nyquil, Robitussin
- Meds often contain: antihistamines, decongestants, acetaminophen
- Chemical structure similar to both Codeine & Ketamine
Dextromethorphan - “DXM”

- Toxicity occurs in dose-dependent fashion:
  - Mild stimulation (1st plateau) 100-200mg
  - Euphoria & Hallucinations (2nd plateau) 200-400mg
  - Dissociative State (3rd plateau) 300-600mg
  - Complete Dissociation with Unresponsiveness (4th plateau) >600mg
- Serotonin Syndrome possible when congested with MAO inhibitors and SSRIs
Dextromethorphan - “DXM”

- Onset: 30-60 minutes, Duration: 4-6 hours
- Clinical Features:
  - Tachycardia, hyperthermia
  - Dilated pupils, Nystagmus
  - Euphoria, hallucinations, psychosis, agitation, coma
  - Ataxic “Zombie” gait
- Beware: Serotonin Syndrome presentation
Dextromethorphan - “DXM”

- Supportive Care:
  - Restraints & Sedation
  - Aggressive cooling measures for hyperthermia
  - Fluid therapy for rhabdomyolysis
  - **Benzos** versus **Cyproheptadine** for Serotonin Syndrome
  - GI Decontamination (only in 1st hour, use with caution)
  - Naloxone Therapy (High Doses Required - up to 10mg)
    - Can help reverse respiratory depression & coma
Salvia divinorum
Herb within the mint family native to southern Mexico
Salvia divinorum

- Marketed as legal and safe hallucinogen online
- Active ingredient, salvinorin A, acts as a kappa opioid agonist. Differs from LSD and Magic Mushrooms which are serotonin agonists.
- Usual dose is 10-20 leaves chewed or 2-5 leaves smoked
- Psychotropic Effects
  - confusion, hallucinations, sensory distortion, synesthesia, elevated mood, introspection
  - Benzodiazepines can be used for agitation & acute psychosis
- Severe toxicity is rare
Kratom

- Psychoactive medicinal plant from southeast Asia
- Leaves are chewed or made into tea or pill forms
- Stimulant effects at low doses, improves mood & alertness
- Opiate effects at high doses, chronic pain control
- Serotonergic properties as well
- Used to manage opiate withdrawal
I can't believe I got the runs my first time trying shrooms.

Oh well, at least I'm not hallucinating.
Additional Drug Trends:
Caffeine Powders
Alcohol Trends
25i
Krokodil
Oxi
Caffeine powder

- Bulk bags available online
- 1 tsp = 25 cups of coffee (3500mg) = Lethal dose
- Tachycardia, arrhythmias, seizures, N/V, disorientation
- Easy to OD
Alcohol Trends

- Smoking or Nebulizing alcohol
  - less calories
- Powdered alcohol
  - just add to water
- Rectal alcohol - “butt chugging”
  - rapid absorption
25i - NBOMe

- Psychodelic drug with effects similar to LSD
- Binds to Serotonin 5HT2a receptor
- Sublingual, buccal, nasal / insulflation
- Positive effects: Stimulation, synesthesia, empathy, strong visuals
- Negative effects: Paranoia, seizures, death
INTERVENTION

WE'RE WORRIED ABOUT YOU, MAN. YOU NEED TO LAY OFF THE PILLS.

YOU TRIED TO BITE ME. JERK.