

Street Drugs

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Chemical Dependency Stats

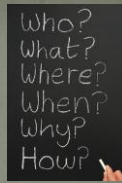
- Associated with 25-50% of hospital admissions
- 19.1 million Americans use illicit drugs
- 0.4% to 27% (depending on sample) of pregnant women use illicit drugs
- More than 175,000 people annually come to the emergency department requesting medical detox or substance abuse services

Common Drugs of Abuse

- Alcohol
- Marijuana (or marijuana synthetics)
- Opiates (heroin, prescription drugs, dextromethorpan)
- Sedating agents (Benzodiazepines, sleep aids)
- Stimulants (Amphetamines, cocaine, MDMA (ecstasy), nicotine)
- Hallucinogens (LSD, PCP, bath salts (MDPV*))

Assessment of the Chemically Dependent Patient

- Complete list of substances used
- Amount used
- Manner of use
- Frequency of use
- Duration of use
- Date and time of last use of each substance
- Withdrawal history
- Periods of sobriety



Assessment of the Chemically Dependent Patient

- Be supportive and non-judgmental
 - Patients are reluctant to report the extent of their use
 - Accurate information is key to anticipating clinical deterioration caused by overdose or withdrawal syndromes
- Families can provide additional information
- Urine drug screens may be helpful in determining current drugs of abuse, HOWEVER-it is important that the provider be aware of causes of inaccuracies in urine drug screen testing!

Urine Drug Screen Average Detection Times

- Alcohol- 7-12 hours
- Amphetamines- 48 hours
- Benzodiazepines
 - Short acting (lorazepam)-3 days
 - Long acting (diazepam)-30 days
- Cocaine Metabolites-2-4 days
- Cannabinoids (THC)-Varies with use
 - Single use- 3 days
 - Long-term heavy use-30 days
- Opioids-Varies with drug ingested
 - Codeine, Heroin, Morphine-48-72 hours
 - Methadone, Dilaudid, oxycodone-2-4 days



Urine Drug Screen Common Sources of False-Positives

- Amphetamines
 - Psychotropic medications (Bupropion)
 - Phenothiazines (Chlorpromazine, promethazine)
 - Pseudoephedrine
 - Ranitidine
 - Trazadone
 - Phenteramine
- Benzodiazepines
 - Sertraline
 - Duraprox
- Cocaine
 - Coco leaf tea
 - Topical anesthetics containing cocaine

Urine Drug Screen Common Sources of False-Positives

- Cannabinoids
 - NSAIDS
 - Proton Pump Inhibitors
 - Hemp-containing foods
 - Passive inhalation
- Opioids
 - Dextromethorphan
 - Diphenhydramine
 - Poppy seeds
 - Rifampin
 - Quinine



Urine Drug Screen- False Negatives

- Cannabinoids
 - Addition of Visine eye drops to the urine can alter results
- Opioids
 - Fentanyl and oxycodone are rarely detected with standard methods
 - Some labs have increased the cutoff to avoid false positives associated with poppy seed ingestion
- Amphetamines
 - MDMA (ecstasy) is more difficult to detect than methamphetamine

Urine Drug Screening Final Thoughts

- A confirmatory test should be done before clinical decisions can be made on the basis of UDS test results.
- UDS's do NOT provide information regarding:
 - Length of abuse
 - Specific length of time since last ingestion
 - State of intoxication



Opioids

Opioid Use in the US-An Epidemic

- Americans constitute 4.6% of the world's population, but consume approximately 80% of the world's opioid supply
- We consume 99% of the world's supply of hydrocodone
- We consume roughly two-thirds of the world's illegal drugs.
- Between 1999 and 2006, the number of persons aged 12 and older illicitly using prescription pain relievers doubled from 2.6 to 5.2 million.
- The new "drug dealer" is diversion through family and friends or licensed prescribers

Types of Opioids

- **Naturally occurring opioids** (opium and morphine): Endogenous neural polypeptides such as endorphins are also natural opioids.
- **Semi-synthetic opioids:** Semisynthesis is a type of chemical synthesis that uses compounds isolated from natural sources (eg, plants) as starting materials.
 - Ex: heroin, oxycodone, oxymorphone, and hydrocodone
- **Synthetic opioids:** Synthetic opioids are man-made.
 - Ex: buprenorphine, methadone, fentanyl, meperidine, codeine, and propoxyphene (withdrawn from US market)

Opioid Mechanism of Action

- Opioids act by binding to opioid receptors on neurons distributed throughout the nervous system and immune system.
- These receptors are the binding sites for several families of endogenous peptides that regulate several important functions, including:
 - Pain
 - Stress
 - Temperature
 - Respiration
 - Endocrine activity
 - Gastrointestinal activity
 - Mood
 - Motivation

Opioid Effects

- Pain relief
- Mood alteration (often producing euphoria and decreased anxiety)
- Respiratory depression (can cause death in overdose)
- Decreased gastrointestinal motility (can cause constipation)
- Cough suppression
- Suppression of corticotropin-releasing factor and adrenocorticotropin hormone
- Pinpoint pupils (miosis)
- Nausea, vomiting, pruritis (less common)



Assessment Findings Associated with Opioid Abuse

- Mental status- range from tranquility and euphoria, to delirium and coma. Indifference to pain may be present.
- Respiratory depression (may occur while the patient maintains consciousness)
- Alterations in temperature regulations
- Hypovolemia (true as well as relative), leading to hypotension
- Miosis
- Needle marks or soft tissue infection (if injected)
- Increase sphincter tone (can lead to urinary retention)

Opioid Withdrawal

- Autonomic symptoms - Diarrhea, rhinorrhea, diaphoresis, lacrimation, shivering, nausea, emesis, piloerection
- Central nervous system arousal - Sleeplessness, restlessness, tremors, irritability, yawning
- Pain - Abdominal cramping, bone pains, and diffuse muscle aching



Opioid Intoxication/Overdose Treatment

- Support airway and ventilation, if needed
- Assess and support cardiac function.
- Provide IV fluids to correct opioid induced hypotension.
- Frequent monitoring
- **Don't forget to assess for concomitant APAP overdose**
- Give IV naloxone if necessary
 - Specific opiate antagonist
 - Rapidly reverses the respiratory depression and sedation when administered IV
 - Short half life-may require additional doses



Opioid Withdrawal Adjuvants

- Buprenorphine (Suboxone)-partial antagonist at opioid receptor.
 - Displaces all opioids at the receptor
 - Only used after acute withdrawal has passed
 - Administered sublingually
 - Has positive affect on mood
- Clonidine-lessens adrenergic hyperactivity, perceived restlessness and anxiety
- Symptom control with acetaminophen, NSAIDS, antidiarrheals, antispasmodics, anti-emetics

Cannabinoids

Cannabinoids (THC)

- Natural or synthetic forms
- Synthetic forms are commonly made by spraying a liquid form of chemicals that mimic the action of THC on grass, leaves, or potpourri for smoking
 - K2, Spice, potpourri
 - A mixed bag of chemicals, 4-10x the strength of natural marijuana
 - May not be discovered on a routine UDS



Clinical Manifestations of Cannabinoid Ingestion

- Altered mental status, ranging from calm to coma
- Tachycardia
- Altered musculoskeletal movements and tone
- Alterations in speech
- Psychosis
- Seizures
- Reports of STEMI several days after inhalation
- Treatment is supportive

Stimulants

Cocaine



Cocaine Abuse

- Cocaine is the most common cause of drug-related ED visits in the United States
- Accounted for 548,608 ED visits in 2006
- Between 30% and 60% of individuals who take cocaine combine it with alcohol, which increases the risk of mortality and complications
- Most frequent cause of drug-related deaths reported by medical examiners
- The National Institute on Drug Abuse (NIDA) estimates that 10% of individuals who begin using cocaine progress to serious, heavy use.

Cocaine-Mechanism of Action

- ↑ norepinephrine release and ↓ norepinephrine reuptake
- ↑ release and ↓ reuptake of serotonin and dopamine
- Anesthetic effects caused by sodium channel blockade, which inhibits the conduction of nerve impulses
- Potassium channel blockade
- Fat soluble, freely crosses blood-brain barrier
- Potentiates dopamine transmission, producing the pleasurable effects that result in its widespread use

Cocaine Abuse

- Highly addictive
- Potent vasoconstrictor
 - Increased HR
 - Increased blood pressure
 - Increased body temperature



Other forms of Cocaine Use

- Crack
 - The term "crack" describes the crackling sound heard when cocaine freebase is smoked.
 - Lipid soluble, rapidly absorbed in the pulmonary capillaries.
 - "Crack lung," a syndrome usually occurring 1-48 hours after cocaine smoking, is a hypersensitivity pneumonitis. Clinical manifestations include chest pain, cough with hemoptysis, dyspnea, bronchospasm, pruritus, fever, diffuse alveolar infiltrates without effusions, and pulmonary and systemic eosinophilia.
- "Speedballing"
 - Combining heroin and cocaine use

Clinical Manifestations Associated with Cocaine Use

- Asthma-type symptoms
- Sinusitis
- Blurry vision
- Symptoms of mesenteric ischemia
- GI upset
- Abscesses
- Extrapyrimal reactions/movement disorders
- Tactile hallucinations, paranoia
- Every body system is affected by cocaine use!

Physiologic Effects of Cocaine Use

- Cardiomegaly, Dilated Cardiomyopathy
- Arrhythmias due to direct cardiotoxic effects
- Accelerated atherosclerosis
- Vasoconstriction due to alpha-adrenergic properties (patient at risk for unopposed alpha syndrome with beta blocker administration)
- Myocarditis
- Seizures
- Agitated delirium (increased risk of accidental death)
- Hyperthermia (causes renal failure, disseminated intravascular coagulation, acidosis, hepatic injury, and rhabdomyolysis)



Amphetamines

Amphetamine Use

- An estimated 13 million Americans use illicit amphetamines
- Most commonly used by single white men
- Can be ingested, inhaled, or injected

Method	Onset	Peak
Ingestion	1 hour	2-3 hours
Inhalation	3-5 minutes	30 minutes
Injection	1-5 minutes	30 minutes

Amphetamines-Mechanism of Action

- Amphetamine compounds cause a general efflux of biogenic amines from neuronal synaptic terminals (indirect sympathomimetics)
- Amphetamines also inhibit monoamine oxidase, and an increase of neurotransmitter release into the synapse
- Chronic use can lead to a depletion of biogenic amine stores and a paradoxical reverse effect of the drug

Amphetamines-Clinical Effects

- Elevated catecholamine levels usually lead to a state of increased arousal and decreased fatigue
- Increased dopamine levels at synapses in the CNS may be responsible for movement disorders, schizophrenia, and euphoria
- Interaction with serotonin may cause hallucinogenic and anorexic effects. Hyperthermia is also associated with this pathway

Amphetamines-Clinical Manifestations

- | | |
|--------------------------|---------------------------------------|
| • Similar to cocaine | • May produce long-term schizophrenia |
| • Tachycardia | • Disorientation, headache |
| • Pulmonary hypertension | • Agitation |
| • Seizures | • Dry mouth, nausea/vomiting |
| • Cardiomyopathy | • Deep, infected ulcerations |
| • Hyperthermia | • Chest pain, palpitations |
| • Hallucinations | • Bruxism |
| • Stroke | • Diaphoresis |
| • Hypertension | • Hyperactivity |
| • Weight loss | • "Meth mouth" |
| • Mydriasis | |

3,4-methylenedioxy-N-methylamphetamine



- A synthetic amphetamine
- "Ecstasy" form is commonly laced with other substances like caffeine or methamphetamine
- A newer, purer form "Molly" is resurfacing
- Sometimes touted as a "safer amphetamine"
 - Can cause dehydration
- Symptoms consistent with other amphetamines, bruxism more common

Cathinones

- AKA “bath salts”, “plant food”, or “insect repellent”
- MDPV is a synthetic, cathinone-derivative, central nervous system stimulant that produces a cocaine- or methamphetamine-like high
- Administered via oral ingestion, nasal insufflation, smoking, IV or IM, or the rectum
- Intoxication lasts 6 to 8 hours
- High addictive potential
- NOT detected in routine drug screens
- Overdoses are life-threatening



Effects of Cathinones- “Bath Salts”

- | | |
|---|---|
| <ul style="list-style-type: none"> • Physical manifestations • Tachycardia • Hypertension • Arrhythmias • Hyperthermia • Diaphoresis • Rhabdomyolysis • Seizures • Stroke • Cerebral edema • MI, cardiorespiratory collapse. | <ul style="list-style-type: none"> • Behavioral effects • Panic attacks • Anxiety • Agitation • Severe paranoia • Hallucinations • Psychosis • Suicidal ideation • Self-mutilation • Behavior that is aggressive, violent, and self-destructive |
|---|---|

Management of Acute Stimulant Intoxication

- ABCs
- Treatment of arrhythmias (anti-arrhythmic drugs, cardioversion, defibrillation)
- Fluid resuscitation and cooling measures
- Consider activated charcoal for oral ingestions
- Consider foley catheter
 - Urinary retention is common
 - Diuretics may be required for acute pulmonary edema
 - or symptoms may be treated with sedation and observation
- Generous benzodiazepines, monitor for seizures
- Calm environment. Avoid physical restraints, if possible.
- Avoid use of beta-blockers in order to prevent unopposed alpha effect (vasoconstriction).
- Cardiogenic pulmonary edema can be managed with nitroglycerin and diuretics.

Management of Acute Stimulant Intoxication/Overdose

- Consider anti-psychotic agents
- Cocaine Overdose specifics
 - Avoid Epinephrine-effects mimic those of cocaine
 - Consider vasopressin in the intra-arrest period
 - Lidocaine may block some of the effects of stimulant at the receptor is useful for treating cardiac dysrhythmias
 - Nitroglycerine and phentolamine are effective for reversing cocaine induced coronary vasoconstriction



- Don't forget to look for traumatic injuries!!





Hallucinogens

Phencyclidine (PCP, or angel dust)

- A dissociative anesthetic
- Usually smoked, but can be ingested, snorted, or injected
- Effects include:
 - Moderate doses (5mg or less): relaxation, euphoria, but may cause depression, anxiety, or disorientation. Users feel powerful, detached and may experience visual distortions.
 - Physical effects include: tachycardia, hypertension, hyperthermia, diaphoresis and flushing, shallow breathing, numbness, and loss of coordination.
 - Higher doses- bradypnea, nausea, vomiting, loss of balance, and dizziness. Dramatic mood swings, anxiety, paranoia, aggressiveness and violence are common.
 - PCP-induced psychosis that may mimic symptoms of schizophrenia. Psychotic episodes can last several days, and it may take as long as two weeks for patients to return to normal.
- At toxic levels, or when interacting with alcohol or other depressant drugs, PCP can prove fatal, causing convulsions, coma, and respiratory arrest. PCP can also exacerbate pre-existing mental disorders
- Called "Wet" when a marijuana cigarette is dipped in PCP

Lysergic acid diethylamide (LSD)

- Generally taken orally in small doses
- Commonly impregnated on special paper, but also comes in tiny pills, gelatin, and liquid forms
- Physical effects include:
 - Dilated pupils, hyperthermia, tachycardia, hypertension, insomnia, anorexia, tremors, anxiety, depression, panic, impaired judgment, psychosis
- Psychological effects can last for 12 hours. During the first 30 to 90 minutes, changes in visual perception and mood are likely. As the drug achieves its one-to two-hour "peak," the user may experience distorted impressions of time, space, and distance
- Overdose can result in a longer, more intense and more frightening trip, and the spontaneous, recurring hallucinations known as flashbacks can occur days, weeks, or more than a year after LSD use (called HPPD)

Other Hallucinogens

- Tryptamines
 - Mushrooms
 - DMT/DET
 - Found in seeds and plants
 - Also produced synthetically
 - Bufotenine
 - Found in mushrooms, seeds and skin glands of Bufo toads
 - Commonly referred to as "Foxy"
- Mescaline
 - Commonly derived from the Peyote cactus
 - Also from San Pedro cactus
- Salvia

2C-C-Nbome and analogues

- AKA N-bomb AKA "Smiles," 25-i, "Wiz", "Wizard Piss" and 25INBOMe
- Easy to produce synthetic hallucinogen
- Purchased in a powder form and then transform it to a liquid, which is soaked into blotter paper by manufacturers
- Accurate measurement of dosage is difficult, making overdoses common.
- \$5-10 per 1/4 inch square of blotter paper
- Currently no laws that regulate sale or possession
- More potent sympathomimetic effects

Hallucinogenic Overdose

- Few deaths are associated with the physiologic consequences of hallucinogenic overdose
- Most deaths are attributed to irrational acts during intoxication
- Treatment is supportive

What's on the Horizon?

- Krokodil (desomorphine)
 - Widespread use in Russia, few reported cases in the US...for now
- Butane Honey Oil (BHO)-a THC derivative
- Desmethyl fentanyl
 - 40 times stronger than heroin, 80 times stronger than morphine
 - Recent arrests in Canada associated with production of large quantities of the drug



How Do I Keep Up??

- National Institute on Drug Abuse
<http://www.drugabuse.gov/>
- The Poison Review
Thepoisonreview.com
Google "tox blog"
- Streetdrugs.org

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Questions?



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