Drug Abuse and the Heart

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Cobain
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Heroin and Opioids

- Heroin is the most addictive of all narcotics
- Used by 1.8% of Americans 12 and older
- Use is increasing
- Derivative of morphine and most commonly used by injection
- Synthetic opioids include fentanyl and methadone
- Oxycodone and Hydrocodone are semi-synthetic opioids

Heroin and Opioids

- Infection and endocarditis commonly seen
- Leading cause of death is from overdose and trauma
- Street heroin has highly variable concentrations leading to accidental overdoses
- Often cut with other drugs like fentanyl
- Cheaper than ever, used 2 to 6 times a day for about $20-$200 per day
- All opioids contribute to a decrease in respiratory rate


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SYNTHETIC
DRUGS
BATH
SALTS

Amphetamine and Synthetic Cathinone (bath salts)

- First used for battle-fatigued troops and weight loss drugs
- Cathinones are amphetamine analogs
- Effects include: hyper-alertness, hypertension, hyperthermia, tachycardia, sweating, dilated pupils, arrhythmias
- Bath salts have a prolonged duration (days to weeks)

Amphetamine and Synthetic Cathinone (bath salts)

- Cardiomyopathy from repetitive sympathetic stimulation
- Valvular heart disease from direct serotonergic effects (weight loss drugs)
- Arrhythmias, aortic dissection and stroke

Amphetamine vs. Methamphetamine

- Methamphetamine becomes amphetamine in the body when metabolized
- Meth is double methylated and has a much stronger effect
- It acts more quickly, is cheaper, and can be made by amateurs
- Amphetamines can be used for medical purposes but not meth(too dangerous)

Methamphetamine

- Increases catecholamine activity in the part of the peripheral nervous system which controls heart rate and blood pressure
- Causes tachycardia, hypertension, blood vessel spasm, and myocardial necrosis
- Symptoms include chest pain, shortness of breath, and palpitations
- May result in acute MI, aortic dissection, and sudden cardiac death

Methamphetamine

- Chronic use contributes to accelerated coronary artery disease and cardiomyopathy
- Risks increase when combined with alcohol, opiates, and especially cocaine because of a synergistic effect on catecholamine activity


THE
BEATLES


NFL
Patriots
81

Hallucinogens

- LSD, Peyote (mescaline), mushrooms (Psilocybin), and PCP
- Not a huge cardiac risk
- Mostly a psychological effect and violent behavior (PCP)
- Low doses: hyperthermia, tachycardia, hypertension, and increased RR
- High doses: BP, HR and RR drop

MDMA (Ecstasy or Molly)

- Typical effects are euphoria, wakefulness, intimacy, sexual arousal, and disinhibition
- Sympathomimetic amphetamine which is structurally similar to serotonin
- Serotonin syndrome may be present as well (a potentially life threatening condition caused by autonomic dysfunction, abnormal neuromuscular activity and altered mental status

MDMA (Ecstasy or Molly)

- Hypertension, tachycardia, and hyperthermia
- MI, aortic dissection, and intracranial hemorrhage have been reported
- Treatment includes benzodiazepines and sodium nitroprusside
- Avoid beta blockers and too much fluid because of hyponatremia


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Marijuana

- Surprisingly little data about cardiac effects
- Temporally related to cardiac arrhythmias (trigger for atrial fibrillation), sudden death, cardiomyopathy, stroke, and arteritis
- Only 1.8 % of all cannabis-related reports were CV complications
- Probably underreported
- Potency of marijuana has increased significantly

Marijuana

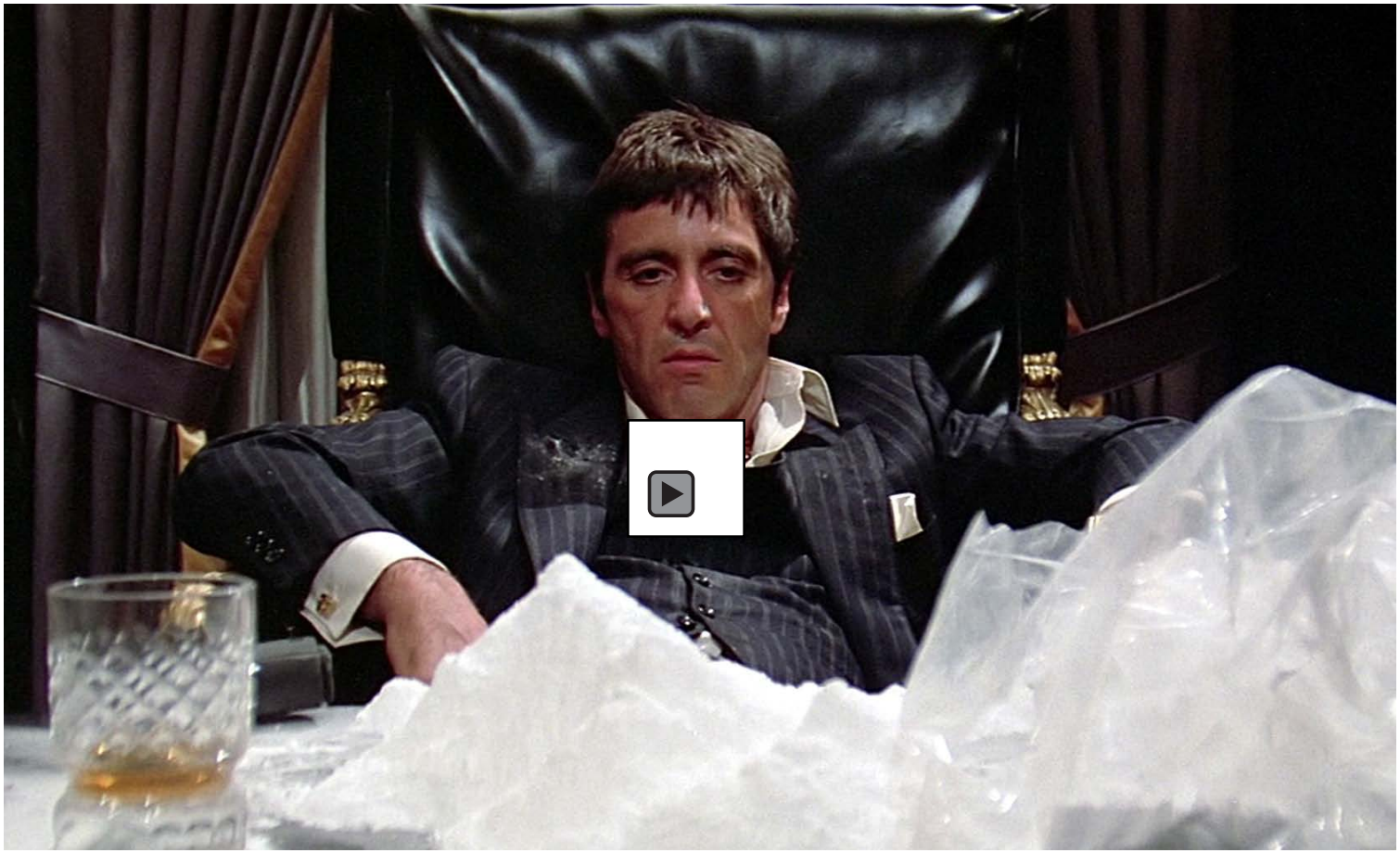
- Increases sympathetic and decreases parasympathetic activity
- Additional problems include:
  - Increasing use (39% of American college students)
  - Low perceived harmfulness of regular use
  - Legalization
  - Gateway drug
  - Higher potency
  - Minimal data

Synthetic Cannabinoids

- K2, Spice, Crazy monkey, etc.
- Second most commonly used drug after marijuana used by high school seniors
- Analogs of natural cannabinoids that are chemically synthesized
- Effects similar to marijuana but additional toxic effects
- Additional tachycardia, hallucinations, delirium and seizures
- Occasional chest pain, ischemia, and MI
- Not detected on rapid urine drug screens

Synthetic Cannabinoids

- Common causes of chest pain:
  - acute coronary syndrome
  - air leak from inhalation and breath holding
  - asthma exacerbation
- Management is typically supported or directed by clinical scenario



Cocaine

- Derived from the coca plant from South America
- Used by 17 million people worldwide
- The illegal drug with the most ED visits – 40%
- Powerful sympathomimetic which increases HR, MAP, and LV contractility through stimulation of both alpha and beta adrenergic receptors
- Also increases endothelin production and diminishes nitric oxide which cause coronary artery vasoconstriction
- Increased platelet aggregation and thrombus formation

Cocaine

- Toxic effects on cardiac muscle from calcium overload related to excessive beta stimulation
- Can lead to myocarditis and cardiomyopathy
- Prolongs the QT interval, reduces vagal activity and increases myocyte irritability
- Chest pain is the most common symptom and can lead to hypertensive crisis, acute MI, aortic dissection, ventricular arrhythmias, and stroke
- Premature coronary artery disease is well described

Cocaine

- Coronary vasospasm leading to thrombus formation more often than plaque rupture
- Initial treatment for hypertension and tachycardia includes IV benzodiazepines
- Aspirin, nitroglycerin or nitroprusside
- Tachyarrhythmia can be treated with verapamil or diltiazem
- Beta blockers should be avoided because of unopposed alpha effect
- Acute coronary syndromes should be treated in the standard way