



"What's the word on the street?"

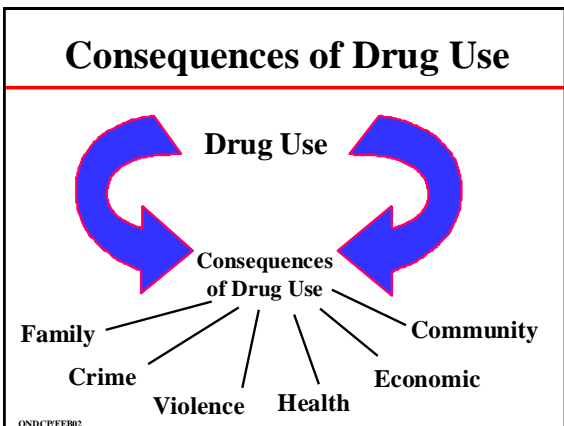
Update on Drugs of Abuse

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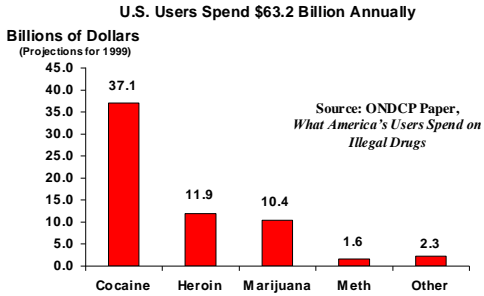



Delaware
2004

<p>State Facts Population: 885,165 Law Enforcement Officers: 1,878 State Prison Population: 6,900 Probation Population: 19,995 Violent Crime Rate National Ranking: 7</p> <p>2008 Federal Drug Seizures Cocaine: 26.2 Kgs. Heroin: 0 Kgs. Methamphetamine: 0.0 Kgs. Marijuana: 6.0 Kgs. Ecstasy: 0 tablets Methamphetamine Laboratories: 2 (DEA, state, local)</p>	<p>No. 7: DELAWARE Assault: 7 Burglary: 18 Murder: 10 Motor Vehicle Theft: 19 Rape: 9 Robbery: 3</p>
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The money spent on drugs saps our economic power



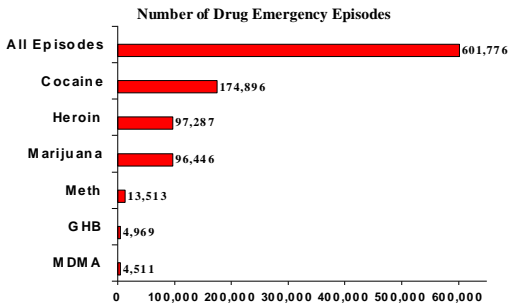
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Health Care Cost Components

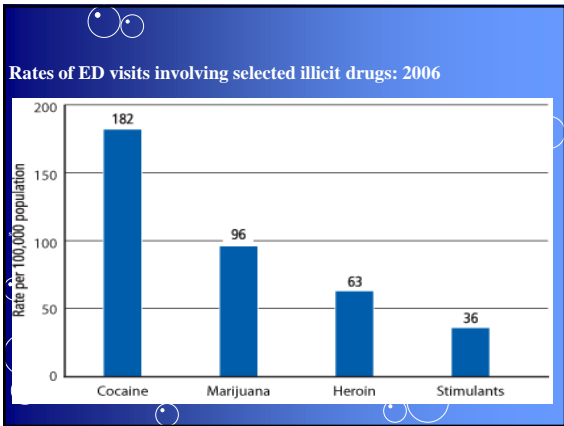
- ◆ Community-based specialty treatment
- ◆ Federally provided specialty treatment
- ◆ Support for drug abuse related services
- ◆ Medical consequences of drug abuse
 - hospital and ambulatory care
 - special disease costs
 - crime victim health care costs
 - health administration costs

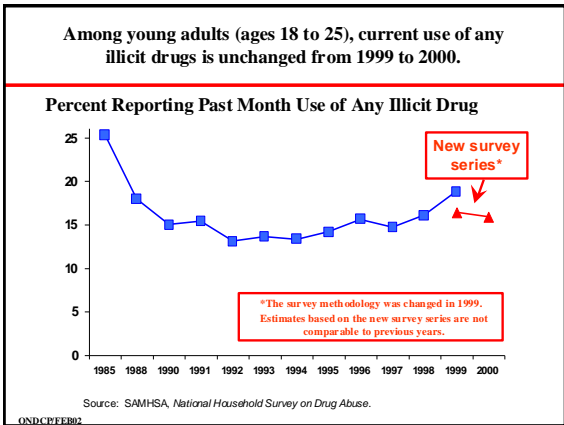
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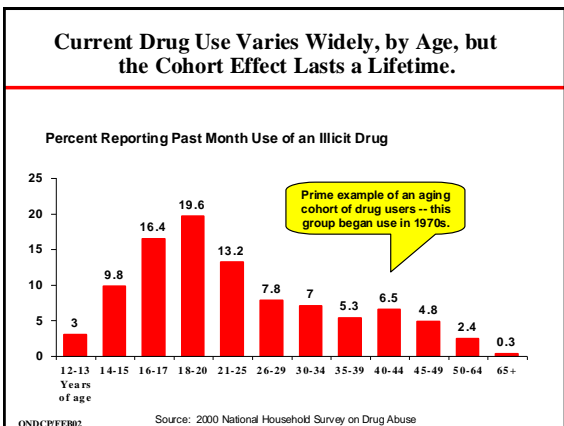
In 2000, more than 600,000 drug-related ED episodes were reported in DAWN -- cocaine is the most often mentioned drug.

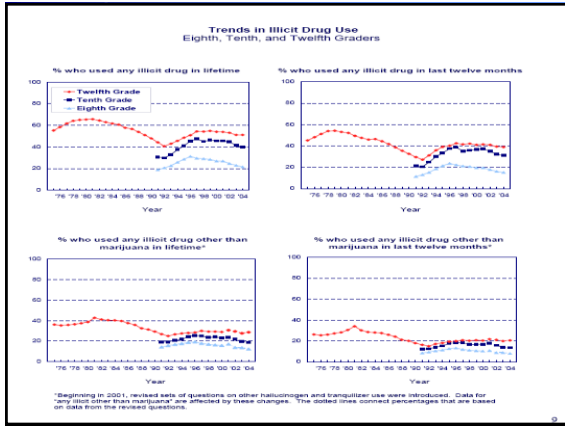


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The need for screening

- Injury is strongly related to substance abuse
- Hospitals do NOT routinely screen trauma patients
 - 1989 survey – 62% BAC, 39% drugs
 - <http://www.ncbi.nlm.nih.gov/books/NIH/CP/Book-Chapter/pt3/part-A3723EA3740>
- Patients with diseases have the right to expect hospitals to seek the underlying causes of their illnesses, and hospitals and physicians are responsible for doing so

NIH facts

- [Rivara et al., 1993](#)
- 2,500 trauma patients followed for 18 months after their injury
- patients who were intoxicated at the time of the initial injury were 2.5 times more likely than other patients in this group to sustain a second injury during the 18-month period
- those who were found to have chronic alcohol/drug use were 3.5 times more likely

Initial Evaluation

- You are a detective and it can be fun
- History is very important
 - friends
 - relatives
 - police
 - paramedics
- Ask someone to check the house!

Physical Exam - Toxidromes

- Sympathomimetic - cocaine, PCP
 - HTN, tachycardia, diaphoresis, seizures
- Anticholinergic - jimson weed, fertilizers, antihistamines
 - dry mouth, dilated pupils, flushing, tachycardia, hand air grabbing is classic
- Opiates
 - pinpoint pupils, hypotension, resp depression
- Sedative/Hypnotics – alcohol, benzos, barbiturates
 - Normal vital signs yet less responsive

What to do immediately ...

- ABCs, vital signs
 - “They’re called vital because....”
- when in doubt, intubate
 - extreme agitation or somnolence
 - controversial – “airway protection”
 - gastric lavage
- check the temperature
 - hypothermia
 - hyperthermia - sympathomimetics

Cocaine "Snow"

- 3.7 million users in US in 2000
 - "look to your left, look to your right"
 - 25 million in US have tried once
- snorted, smoked, injected or squirted into nose
- any mucosal lining is absorptive
- Na channel blocker, ester local anesthetic
- mydriasis, tachycardia, HTN, diaphoresis
- 1980s - recreational use
- 1990s - regular use with dependence
- 18-24 yo, males
- all socioeconomic groups
 - upper: powder
 - lower: crack

Pharmacokinetics of cocaine

Route	Onset	Peak Absorption	Duration
Injected	Seconds	3-5 minutes	15-30 min
Insufflation	1-3 min	20-30 min	60-90 min
GI	Variable	60-90 min	>180 min

Cocaine (2) "Charlie"

- Na channel blocker (local anesthetic and type I antidysrhythmic) and presynaptic uptake of NE, DA, serotonin
- increase in SNS
- Intracranial HTN:
 - talkative, active, sociable, occ. agitated
- Hyperthermia:
 - stimulation of thermoregulatory center
 - increase in psychomotor agitation
 - vasoconstriction
- seizures, strokes, migraines, blindness

Cocaine (3) "Blow"

- Myocardial ischemia
 - may not develop CP for 24-72 hrs
 - myocardial depression of depolarization
 - vasoconstriction, tachycardia, HTN, plt aggregation, thrombus formation
 - EKG sensitivity 35% (high false-negatives)
 - complications usually within 12 hrs, uncommon, AMI rate 5%, arrhythmias, CHF
 - Very low mortality (if any) in studies

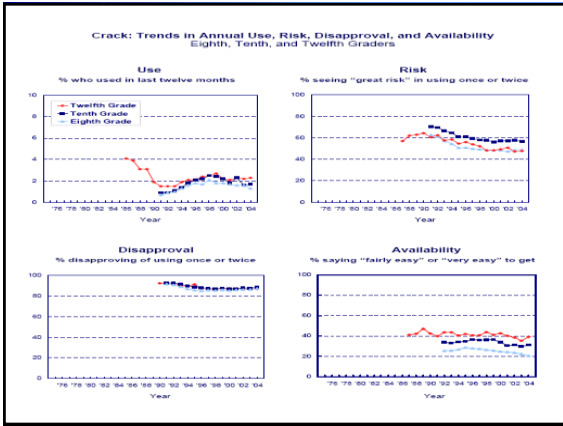
Hollander JE, Hoffman RS, Burstein JL, et al. Cocaine-associated myocardial infarction. *Arch Intern Med* 1995;155(10):1081-1086.

Cocaine (4) "Rock"

- Pulmonary complications:
 - asthma exacerbation, PTX, pneumomediastinum, noncardiogenic PE
 - thermal airway injury
- Pregnancy:
 - prematurity, w/d, abruption
- Rhabdomyolysis:
 - seizures, hyperthermia, immobility, vascular insufficiency

Cocaine (5)

- Treatment
 - attenuate excessive sympathomimetic response
 - sedative/hypnotics - benzos, benzos, benzos
 - consider phenobarbital for status epilepticus
 - cool patient if hyperthermic
 - treat rhabdo with fluids and bicarbonate
 - theoretically hold beta-blockers
 - Phentolamine, nitrates, ?ASA, PTCA



Heroin "Smack"

- Purity ranges from 1%-98% -
 - national average 35%
 - Increase in snorting and smoking due to ↑purity
- Increased teenager use
- Inject (<1min), snort (3min) or smoke (5min)
- mu receptor activation
 - peaks in minutes

Heroin "Junk"

- Deaths mostly from IV use and resp dep
- euphoria, analgesia, clouding, miosis
- "rush" = drug
- "reward" = dependence
- Complications:
 - endocarditis - tricuspid mostly, but can affect left heart valves too - Staph aureus
 - noncardiogenic pulmonary edema may be delayed 24 hours
 - constipation

Heroin "Skag"

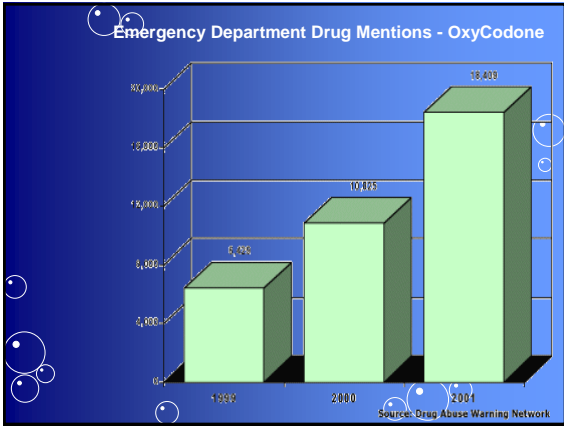
- Treatment
 - airway - consider naloxone in 0.2mg aliquots (IV, SQ, IM)
 - DOA of narcans is 20-90 minutes so observation for hours is recommended due to re-sedation
 - Consider mixed drugs in confusing toxidromes
 - alcohol
 - cocaine

Heroin "Brown"

- Withdrawal
 - piloerection, yawning, rhinorrhea, sweating, lacrimation, vomiting, abd cramping, diarrhea
 - appears 9-14 hrs after last use
 - tachycardia, HTN, tachypnea
 - **Not life threatening**
 - symptomatic - IV fluids, antiemetics, clonidine
- Stuffers/Packers
 - Observe, charcoal, Go-Lytley (or heavily)

Prescription opiates

- Oxycontin, vicodin, percocet
- Rx forgery a monthly occurrence at CCHS
- 12th graders (2003) –
 - 10.5% using Vicodin (non-medical)
 - 4.5% using Oxycontin without Rx
- Chew, crush and snort, dissolve in water and inject



Oxycontin®

Legal sale: 10mg = \$1.25, 80mg = \$6

- On the street: 10mg = \$5-10
- 80mg = \$65-80

Two tablets of generic oxycodone. One side of each tablet is marked "93" and the other is marked "33."

Oxycontin®

- More generic deaths due to 80mg tablet (oral ingestion)
- **Nonmedical Use of Pain Relievers.** Lifetime nonmedical pain reliever prevalence among youths aged 12 to 17 increased from 2001 (9.6 percent) to 2002 (11.2 percent), continuing an increasing trend from 1989 (1.2 percent). Among young adults aged 18 to 25, the rate increased from 19.4 percent in 2001 to 22.1 percent in 2002. The young adult rate had been 6.8 percent in 1992

Metamphetamines "Crank/Ice"

- Structurally similar to catecholamines
- injected, smoked, snorted
- immediate effects
 - aroused, restless, hyperpyrexia, N, V, mydriasis, HTN, oec psychosis
- Treat like cocaine - benzos
- Can last hours (unlike cocaine)
- Keep cardiac ischemia in mind (no data)

LSD "Acid"

- Hallucinogen from the seeds of the morning glory plant
- absorbed from all mucous membranes
- onset of action less than one hour
- hallucinations, paranoia, psychosis
- synesthesia: hearing colors, seeing sounds

LSD "blotters"

- Sympathomimetic:
 - HTN, mydriasis, tachycardia, diaphoresis
 - improvement within 4 hrs, baseline at 12 hrs
- Treatment:
 - prevent behavioral toxicity
 - gentle reassurance
 - consider haldol, benzos

PCP/Ketamine

- “angel dust” “vitamin K” “special K”
- dissociative anesthetic
- smoked, snorted
- on in 3 minutes, off in 15 min
- agitation, confusion, hallucinations, ataxia,
- any nystagmus (vertical is pathognemonic)
- prevent the violence
- Psychosis – ziprasidone, 20mg IM

Jimson Weed “Weed”

- Plant grown right outside Christiana Hospital
- eaten or smoked
- hallucinogen
- high concentration of atropine
- anticholinergic: flushed, tachy, ur retention, hallucinations
- watch bradycardia, heart block, seizures
- consider physostigmine

Marijuana “Grass”

- Most commonly used illegal drug in US
 - “again, look to your left, look to your right”
- tachycardia, injected conjunctiva, euphoria, postural hypotension
- euphoria
- slowed reaction times

Inhalants

- Common household products: glue, gasoline, spray paint, nail polish remover
- hydrocarbons
- sniffed = nose; huffed = mouth
- peaks in 15 to 30 min
- relaxed, sleepy, hallucinations

Inhalants (2)

- Appear drunk
- smell of solvents or remnants on clothes
- Complications:
 - neurologic depression, seizures, asphyxia
 - chronic use: decreased myocardial contractility
 - chemical pneumonitis
 - dysrhythmias

Inhalants (4)

- Gasoline sniffing
 - greatest in adolescents
 - intoxicated in 5 minutes, lasts hours
 - giddiness, excitable, hunger, ataxia, confusion
 - chronics can get lead poisoning - N,V, tremors, delirium, irritability
 - burn injuries

GHB

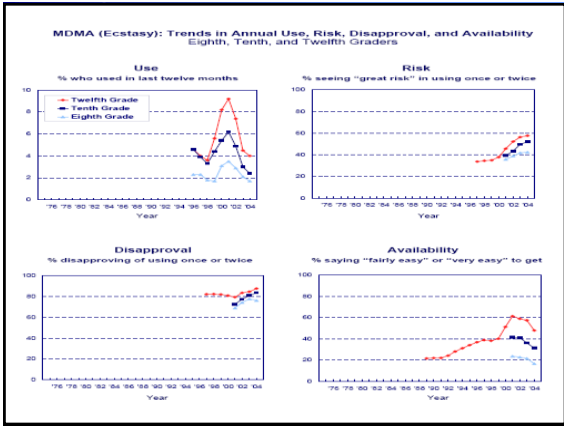
- Initially developed as a GABA analog in the 1960s, anesthetic
- FDA approved for narcolepsy
- Recreational, rave parties, muscle bulking agent, hypnotic, occ “date rape”
- consider physostigmine

GHB

- disinhibition, euphoria
- rapid respiratory/CNS depression
- hypotension, bradycardia, vomiting with aspiration (60% GCS <9), seizures
- Peak 30-60 min, half life 20-53 min,
- Typically recover over 2-6 hrs
- Treatment is supportive, bradycardia responds to atropine
- self extubate, discharge from ED
- Case reports of narcan, physostigmine reversal

Ecstasy

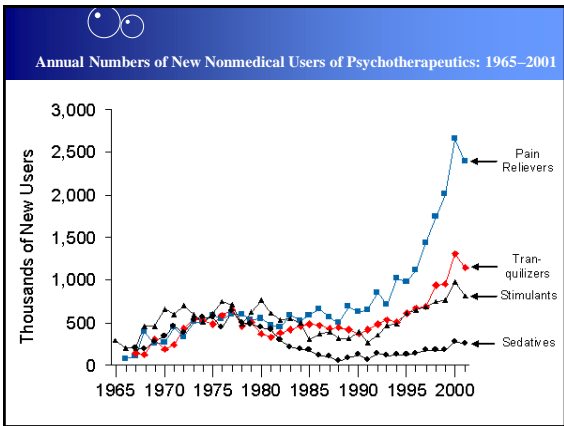
- MDMA, MDEA, MDA – designer drugs (metamphetamines)
- used in ‘Raves’
- Round, white tablets (birds)
- reduces anxiety and lowers defenses
- Lasts 4-6 hrs
- damages serotonin producing neurons
- Hyperthermia, CNS stimulant, alterations in intensity of colors or texture sensation
 - euphoria, heightened sexual interest, verbosity



Ecstasy

- death due to fatal dysrhythmias regardless of CAD
- severe HTN, IC hemorrhage
- hyperthermia, sz, DIC, RF, rhabdo (serotonin syndrome like)
- chronic usage leads to cognitive deficits

National Institute on Drug Abuse, 2004



Ecstasy

- Treatment:
 - quiet room
 - gentle sedation (benzos, haldol)
 - toxicity similar to cocaine, yet can last hours
 - consider charcoal for recent tablet ingestion

Methylphenidate

- AKA - Ritalin
- psychomotor stimulant - like amphetamines
- po, IV, IN
- crushed into powder for more rapid onset and greater toxicity (fatalities)
- sympathetic hyperactivity
- supportive care, benzos, cooling

Designer Drugs

- In the past decade:
 - Older drugs (LSD, cocaine) up 29-48%
 - Non-traditional, emerging, Web-based (NEW) drugs up 187- 5, 400%!
- Internet influence
 - “Anyone with an internet connection can get almost anything delivered to their home or dorm rooms”

Bath Salts



Bath Salts “Ivory Wave”

- The substances sold as “bath salts” and “plant food” products are based on the *Schedule I* controlled substance cathinone, which is a potent central nervous system stimulant
- They are not typical bath salts and have absolutely nothing in common with actual bath salts

Bath Salts “White Lightning”

- Products are sold in a powder or capsule form that can be easily ingested – it can be snorted, smoked, injected and even mixed with water and consumed
- Product can be found in convenience stores, discount tobacco outlets, gas stations, pawnshops, tattoo parlors, truck stops and other locations

Bath Salts "Bliss"

- Cathinone is an active ingredient in the leaves of the khat plant, native to Africa
- These synthetic substances are suspected to be manufactured in bulk quantities in countries such as China, Pakistan, and India, and some of the actual products may be packaged for wholesale distribution in intermediate locations such as Eastern Europe

Bath Salts "Magic Plant Food"

- Distributed and abused in Europe, particularly Great Britain and Germany, for several years
- Mephedrone was first detected as a drug of abuse in Europe in November 2007

Bath Salts

- A small packet of the chemicals typically costs as little as \$20
- They are indirectly marketed as "legal" alternatives to the controlled substances cocaine, amphetamine, Ecstasy, and methcathinone
- The most prevalent synthetic substances encountered within these products include MDPV (3,4-methylenedioxypropylvalerone), mephedrone (4-methylmethcathinone) and methylone (3,4-methylenedioxyethcathinone).

Bath Salts

- mephedrone and methylenedioxypropylvalerone (MDPV), had been previously unregulated because they aren't marketed, or likely intended, for human consumption
- These substances are marketed as "research chemicals," "plant food", or "bath salts", "not for human consumption," to circumvent the Controlled Substances Act

Bath Salts



Bath Salts

- Unique combination of effects and toxicities:
 - In rats:
 - Like meth (unlike ecstasy) – craving occur quickly
 - Like meth – increases cerebral dopamine
 - Like ecstasy – increases cerebral serotonin
 - Like meth and ecstasy – leads to hyperthermia

Bath Salts

- mephedrone causes euphoria, stimulation, an enhanced appreciation for music, an elevated mood, decreased hostility, improved mental function and mild sexual stimulation
- similar to the effects of cocaine, amphetamines and MDMA
- effects last different amounts of time, depending on the way the drug is taken

Bath Salts

- When taken orally, effects within 15–45 minutes
- Snorted, effects are felt within minutes and peak within half an hour
- effects last between two and three hours when taken orally or nasally, but only half an hour if taken intravenously
- 70 Dutch users of mephedrone, 58 described it as an overall pleasant experience and 12 described it as an unpleasant experience. A survey of UK users, who had previously taken cocaine, found that most users found it produced a better quality and longer lasting high, was less addictive and carried the same risk as using cocaine

Bath Salts

- Most common effects:
 - poor concentration, teeth grinding, problems focusing visually, poor short-term memory, hallucinations, delusions, erratic behavior and dilated pupils
 - most severe effects appear anecdotally to be linked with high doses or prolonged usage and that the effects may be due to users taking other intoxicants at the same time
 - Other effects that users in internet forums have noted include changes in body temperature, increased heart rate, breathing difficulties, loss of appetite, increased sweating, discolouration of extremities, anxiety, paranoia, and depression.

Bath Salts

- Snorting can cause nose bleeds or burns
- National Addiction Centre, UK found:
 - 67% experienced sweating
 - 51% headaches
 - 43% heart palpitations
 - 27% nausea and vomiting
 - 15% cold or blue fingers (vasoconstriction)
- Guy's Hospital, London
 - 15 patients they treated after taking mephedrone in 2009
 - 53% were agitated, 40% had increased heart rates, 20% had systolic hypertension and 20% had seizures; three required treatment with benzodiazepines, predominantly to control their agitation

Bath Salts

- Those under the influence of bath salts may also hurt themselves, are agitated and could act paranoid.
- Bath salts also mimic the signs that are common to most drugs, including mood swings, change in dress and friends, a need for money and items missing, a drop in grades, a change in sleep patterns and trouble with relationships.
- Abusers of “bath salt” products have reported that they experienced many adverse effects such as chest pain, increased blood pressure, increased heart rate, agitation, panic attacks, hallucinations, extreme paranoia, and delusions.
- The drugs cause intense cravings Users often binge on it three or four days before they show up in an ED

Bath Salts

- **“Doctors and clinicians at U.S. poison centers have indicated that ingesting or snorting ‘bath salts’ containing synthetic stimulants can cause chest pains, increased blood pressure, increased heart rate, agitation, hallucinations, extreme paranoia, and delusions.”*
- *Nora D. Volkow, M.D., Director of NIDA*
- 40% reported seizures
- 13-40% reported psychosis

Bath Salts

- In 2010, poison control centers in the United States received 302 calls regarding bath salts. In January 2011, US poison control centers had already received 2,237 calls regarding bath salts
- Entire 2011 - 13,000 calls!
- There have been reports in the media of overdoses from ingestion of "bath salt" products which resulted in emergency room visits, hospitalizations, and severe psychotic episodes, some of which have led to violent outbursts, self-inflicted wounds, and, in at least one instance, suicide

Bath Salts

- In Blair County, at least one death has been attributed to a bath salts overdose. In another incident, two friends high on bath salts reportedly fought, stabbing at each other, over another container of the product. It also was reported last week a man high on bath salts in Scranton broke into a church monastery and stabbed a priest.
- *A Lebanon County woman was using bath salts, which contain a synthetic drug, and got behind the wheel with a toddler in the car. Witnesses reported "an erratic driver who had run a red light and was banging her head against the steering wheel."

Bath Salts

- As of April 15, 2011, two of the chemicals used in making MDPV have been banned in 7 states, including Louisiana, Florida, Alabama, Mississippi, North Dakota, Washington and New Jersey.
- One of the chemicals used in MDPV have been banned in 10 more states, including, Idaho, Utah, Wyoming, New Mexico, Arkansas, Kentucky, Michigan, Virginia, West Virginia and North Carolina. Similar measures are pending in Hawaii.

Bath Salts

- The trend in the development, distribution, and consumption of this class of substances in Europe has resulted in the United Kingdom and Germany banning products containing these substances
- *DEA temporarily labelled MDPV as a Schedule I controlled substance
- U.S. Reps. Charlie Dent and Pat Meehan are pushing for a federal ban on bath salts

Spice or K2

- Synthetic cannabinoid
- Originally developed for animal research
- More potent and powerful than natural marijuana
- Agitation, tachycardia, HTN, inappropriate affect

Clin.Toxicol. 2011;49:431-3

Spice or K2

- Many states banned existing compounds
- Federal legislation is pending
- “chemists” create newer synthetic analogs which look different from Spice/K2
 - Evades the legal system
- 11% of high school seniors have used

Meow-Meow

- Mephedrone, 4-methylmethcathinone
- “Drone, Bubble, MCAT”
- Synthetic cathinone from the African shrub
- Stimulant and sympathomimetic
 - Like ephedra and amphetamine
 - Sz, agitation, HTN, tachycardia, hyperthermia

Toxicol. Lett. 2011;201:191-5

Nutmeg

- Doses as high as 50g leads to hallucinations
- Tachycardia, palpitations, agitation

- Clin. Toxicol. 2011;39:177-80

FINALLY

- July 9, 2012 President Obama signed
 - Synthetic Drug Abuse Prevention Act of 2012
 - Added 31 compounds to schedule I
 - 9 fall into cathinone-based “bath salts” category
 - 20 found in synthetic marijuana (Spice or K2)
 - Enhances existing laws in 44 states

The Problem

- Underground chemists constantly alter the molecular makeup of the compounds
- Create versions that are not covered under the new laws
 - Technically legal

What to do when we see these patients?

- No treatment guidelines
- Drug screens are not helpful
- Ask the patient, know the slang
- Check the patient's belongings, pockets
- Symptomatic and supportive
 - Calm quiet room, minimal stimulation
- Benzodiazepines (lorazepam, valium)
- Consider antipsychotics (haloperidol)

What to do when we see these patients?

- Erowid.org
- Lycaeum.org
- Shroomery.org
- Talktofrank.com
- No antidotes
- Symptom-based, goal-directed treatment
 - IVF, EKG, sedation, monitor VS
 - Some NEW drugs last 24 hours
 - Consider counseling!

Overview of Findings from the 2002 National Survey on Drug Use and Health
DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
Office of Applied Studies

- better study design and incentives (\$30)
- all 50 states, over 68,000 interviews

Current and prior national surveys are available at SAMHSA's website:
<http://www.oas.samhsa.gov>