



What's Next in the Street Drug Pipeline?

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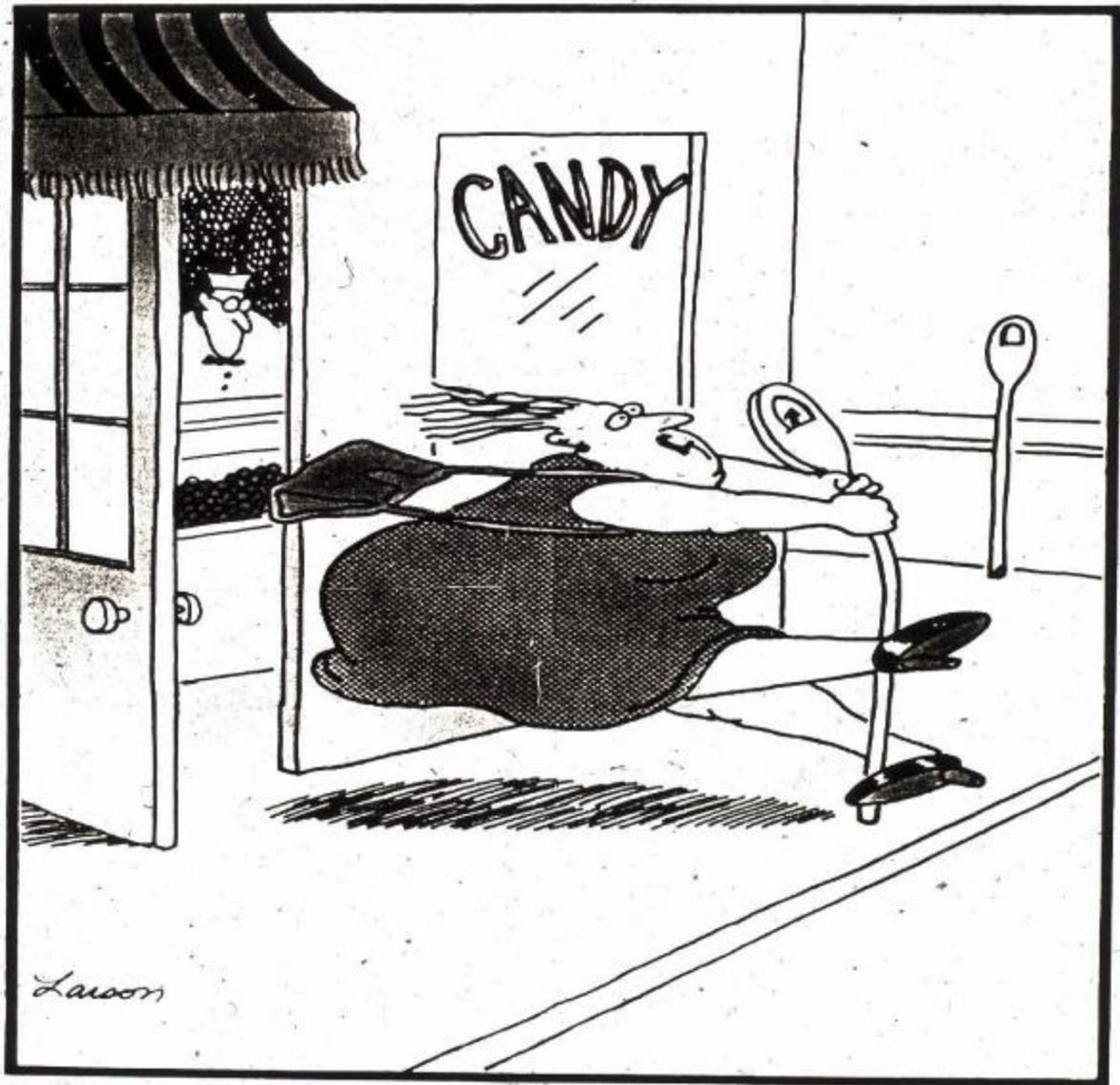
Drugs of Choice

1967

- Alcohol
- Marijuana
- Cocaine
- Crank
- LSD
- Quaaludes
- Glue
- Designer drugs

Now

- Alcohol
- Marijuana/**salvia/synthetic THC**
- Cocaine
- Methamphetamine
- LSD
- Rohypnol/GHB
- Inhalants
- Ecstasy (**Molly**)
- **Bath salts**
- Prescription drugs
- Heroin/**Killer Heroin (Fentanyl)**

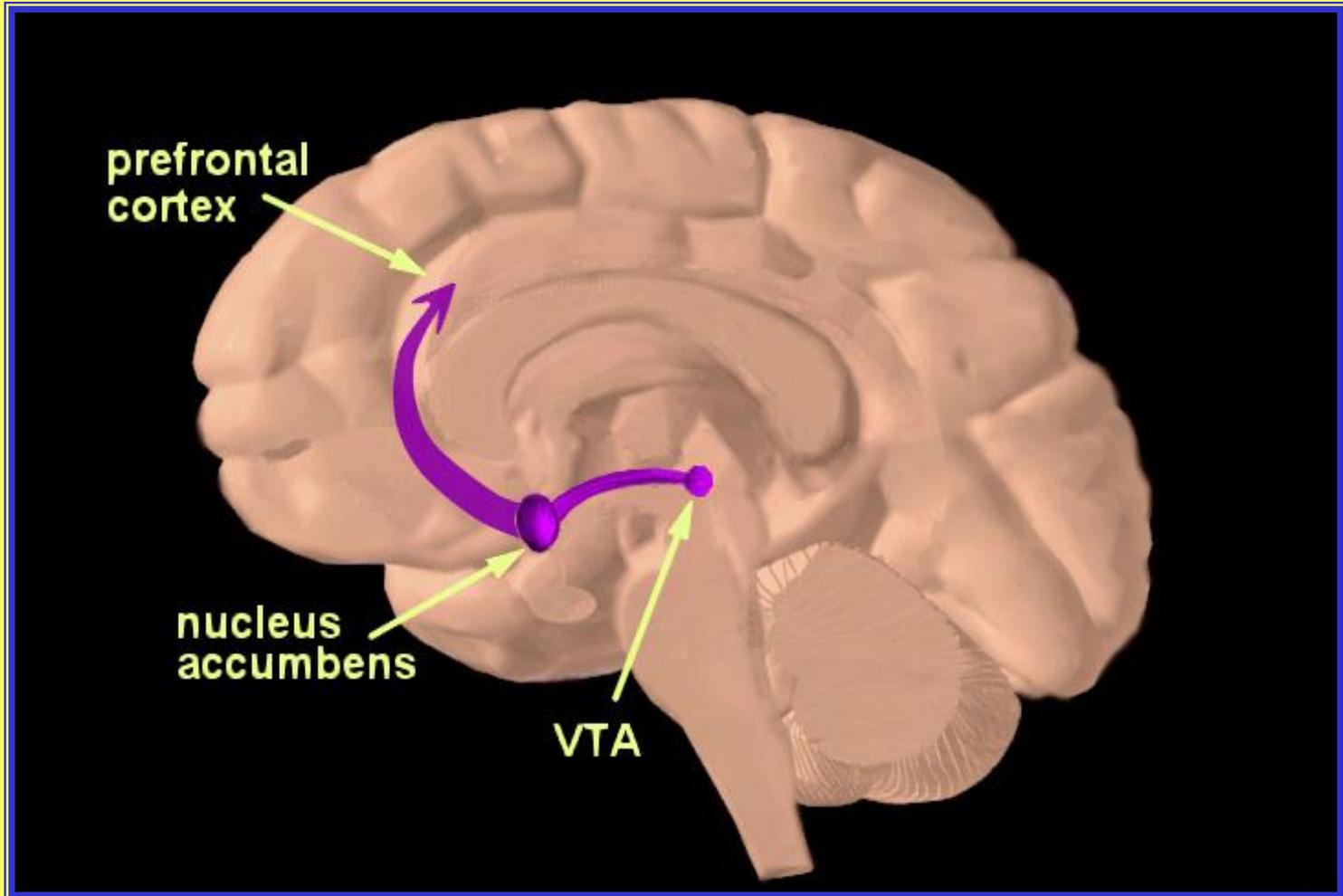


Larson



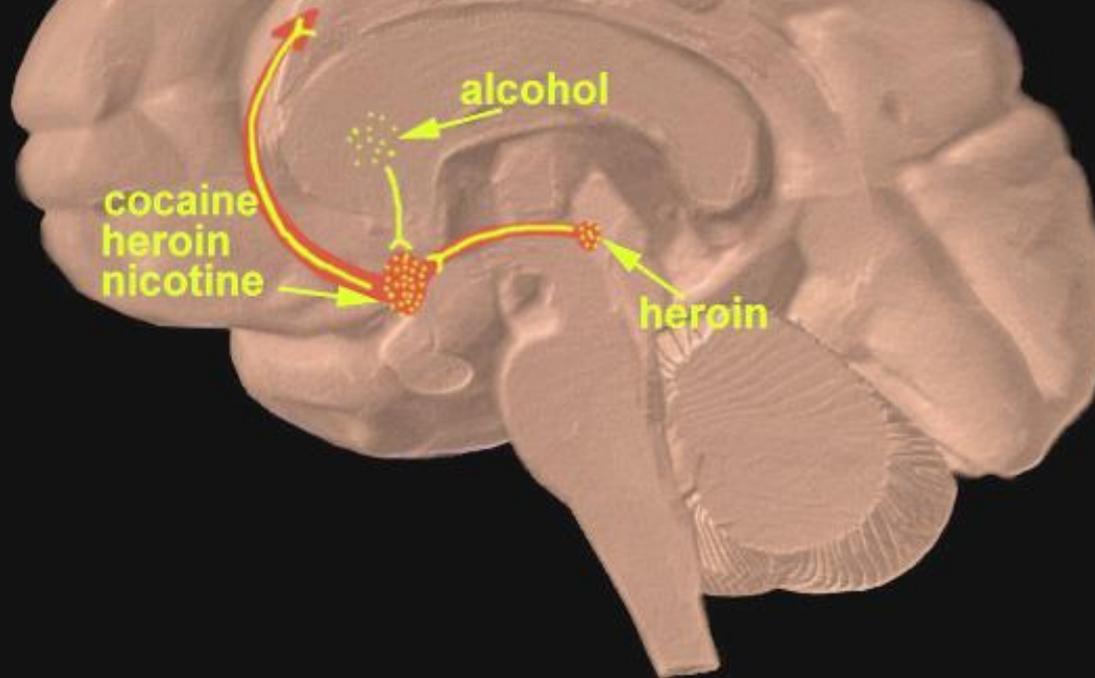
“Let’s just go in and see what happens.”

Brain Reward Pathways

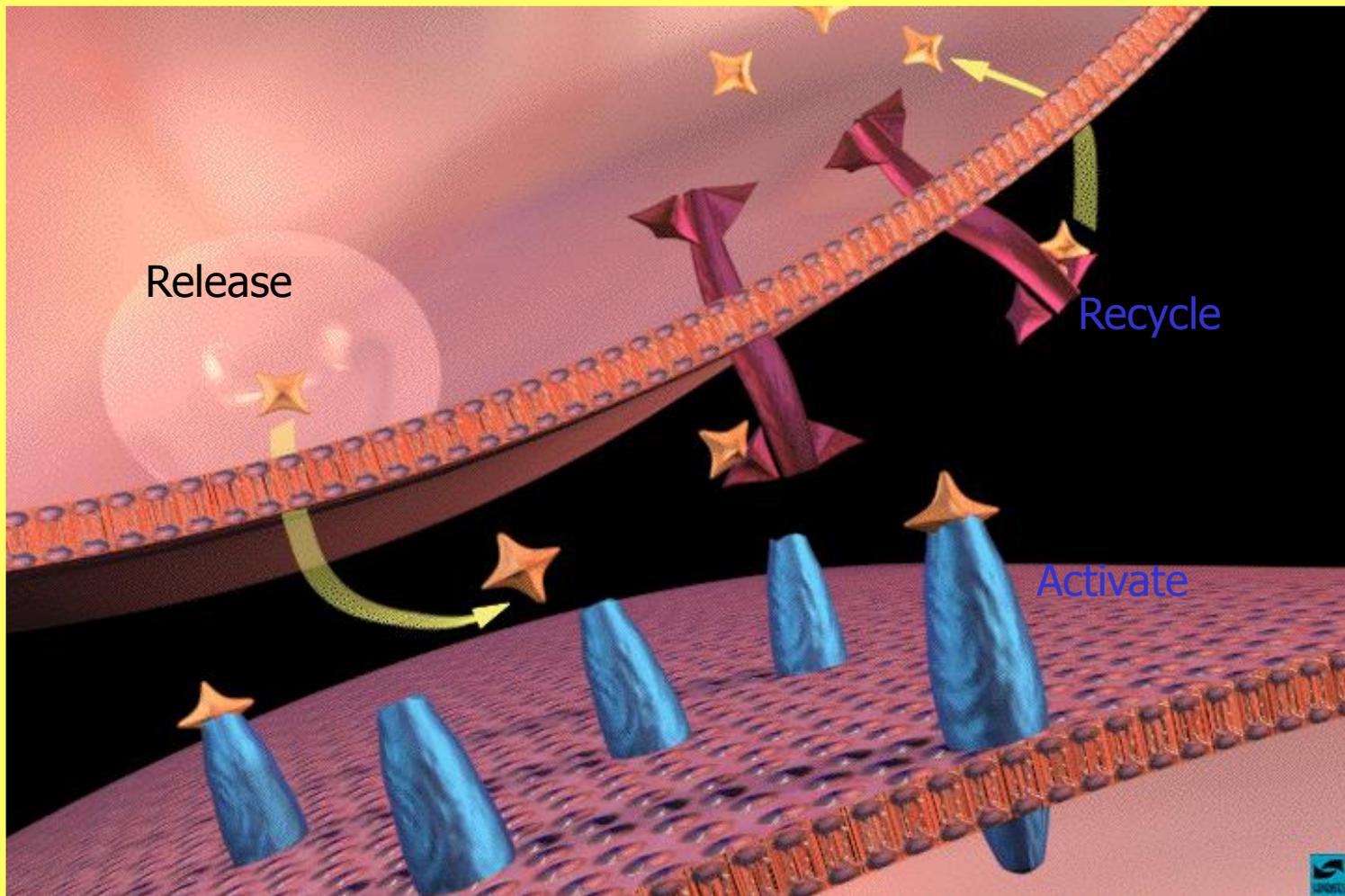


Activation of Reward

Activation of the reward pathway by addictive drugs



Dopamine Spells REWARD

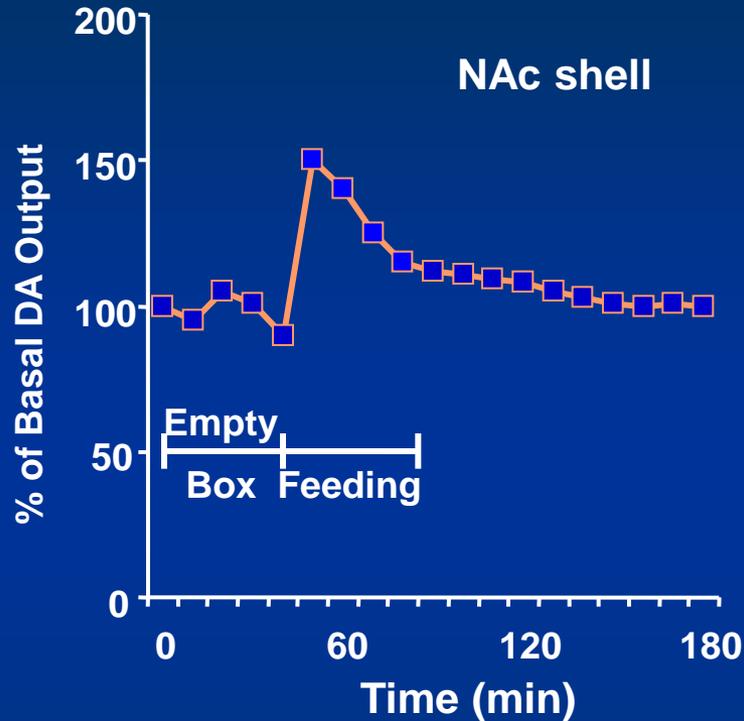


Natural Rewards

- Food
- Sex
- Excitement
- Comfort

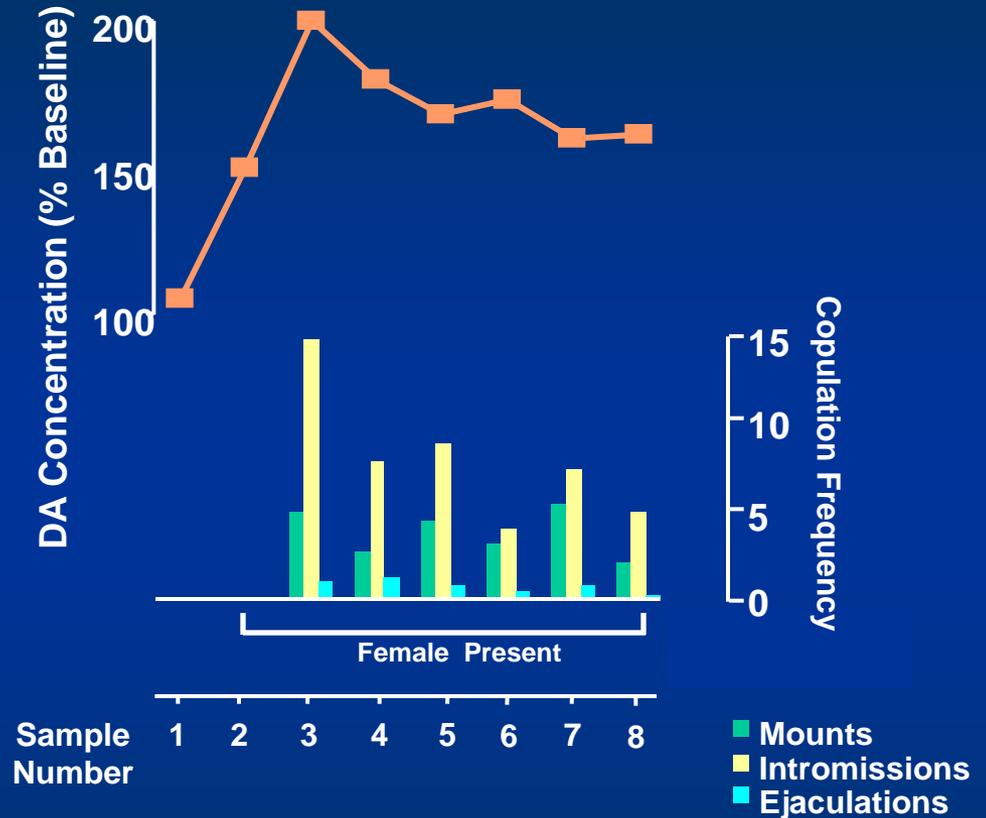
Natural Rewards Elevate Dopamine Levels

FOOD



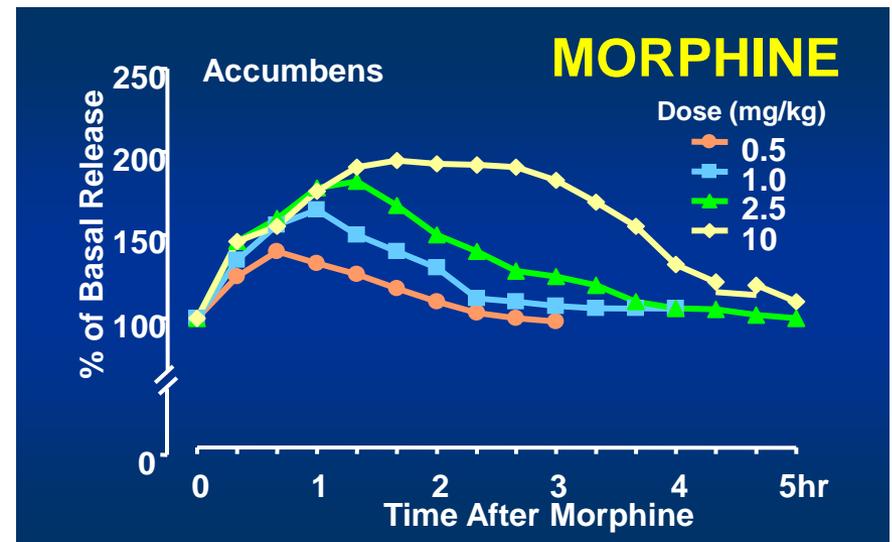
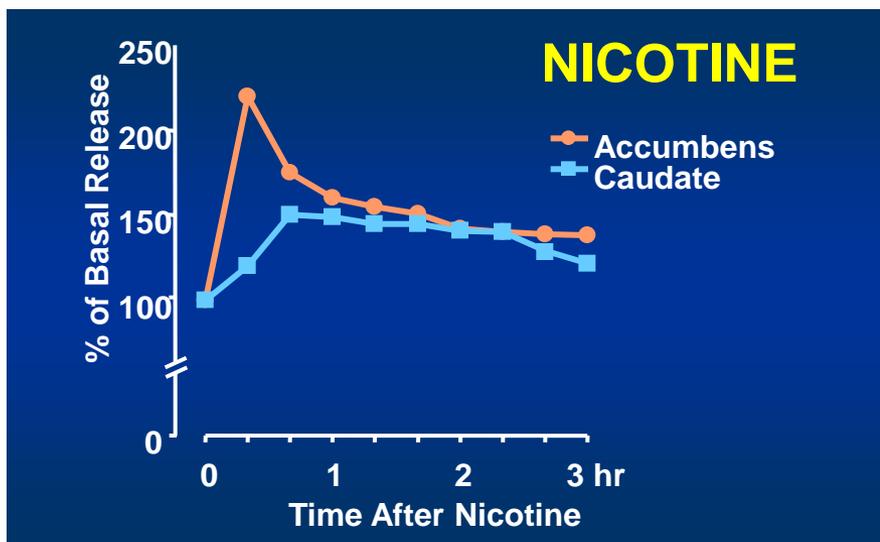
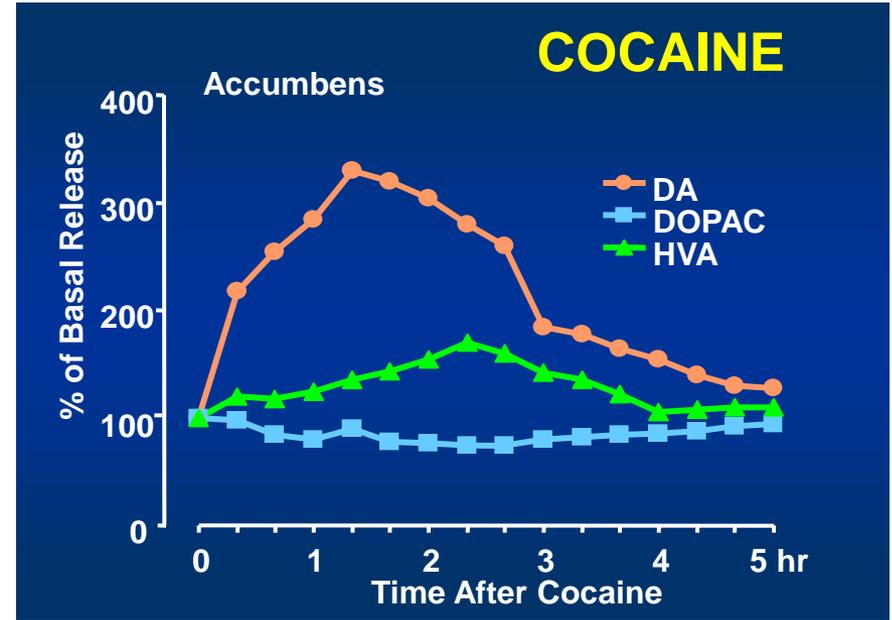
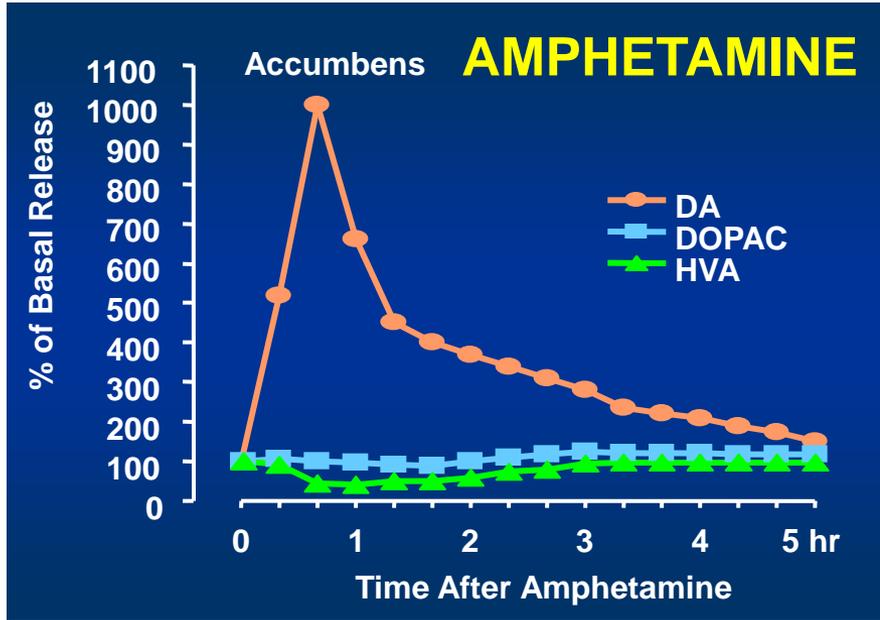
Di Chiara et al., Neuroscience, 1999.

SEX



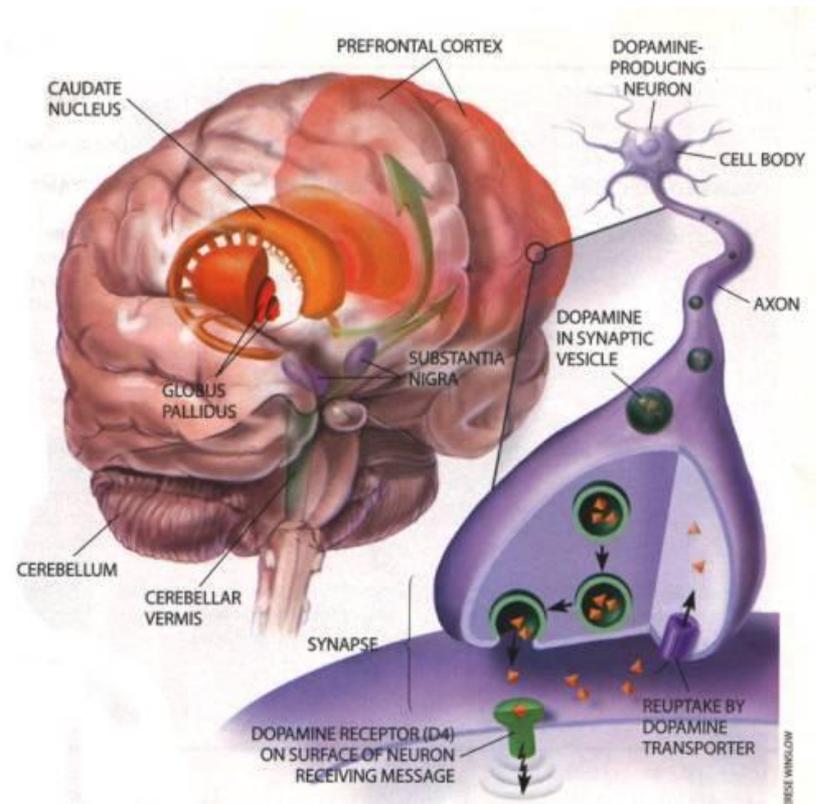
Fiorino and Phillips, J. Neuroscience, 1997.

Effects of Drugs on Dopamine Release



Drugs Hijack the Brain

- Drugs immediately cause an increase in DA
- Continued drug use reduces DA production
- Brain is fooled into thinking that the drug is necessary for survival
- Drug seeking behaviors occur



The brain images below show how alcohol may harm teen mental function. Compared with a young non-drinker, a 15-year-old with an alcohol problem showed poor brain activity during a memory task. This finding is noted by the lack of pink and red coloring.

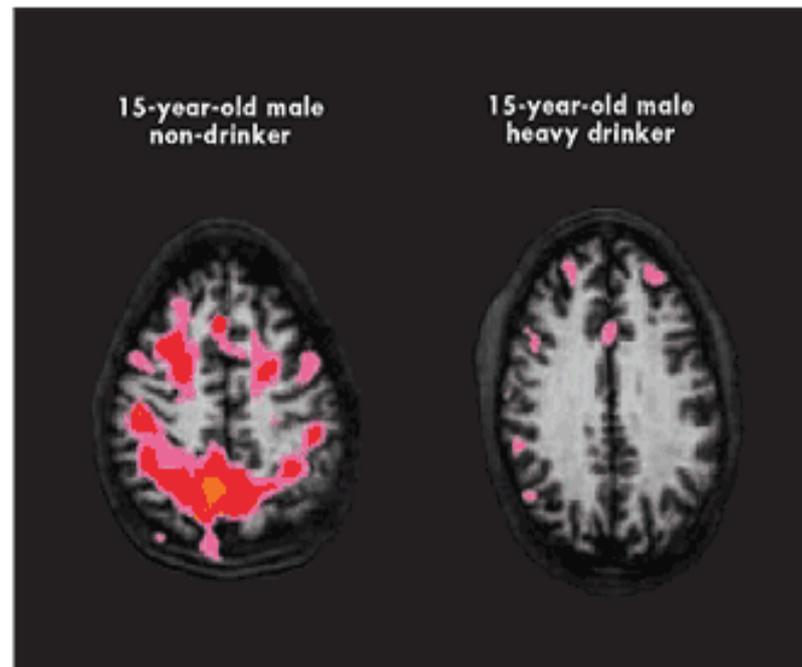


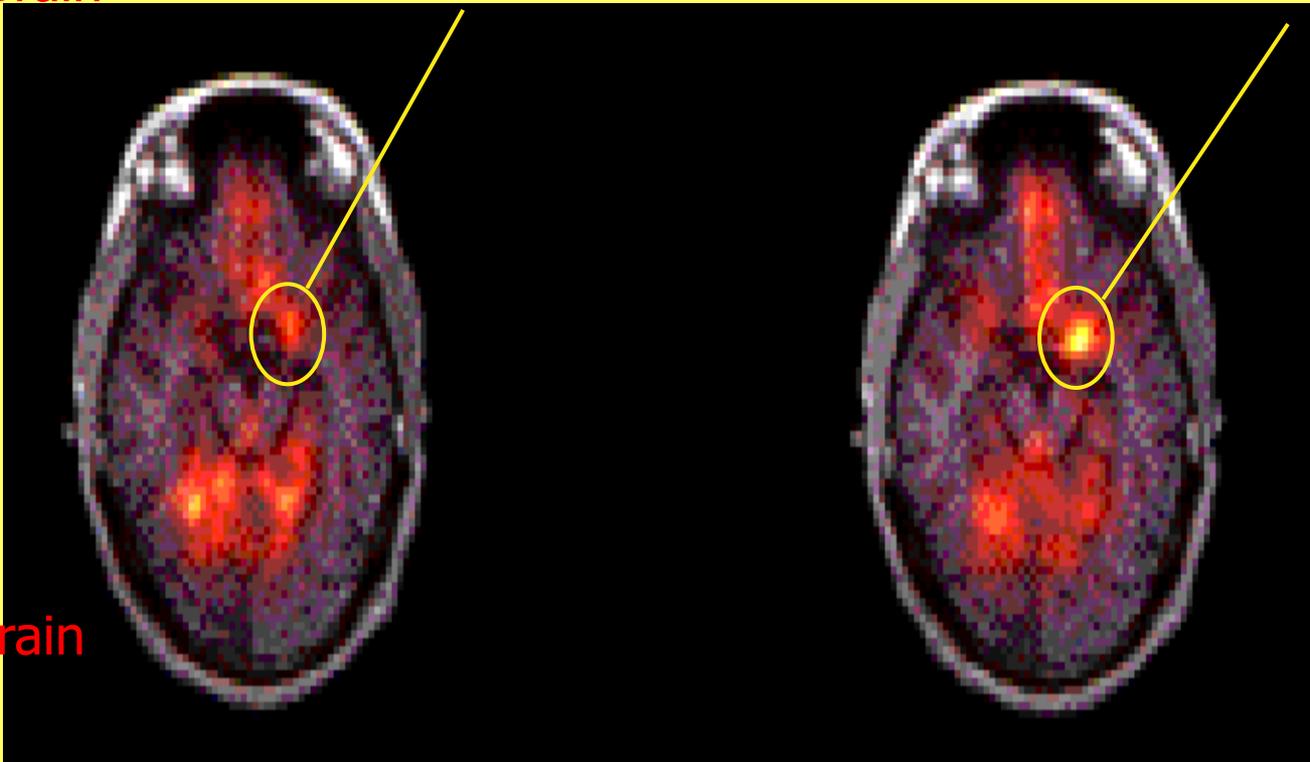
Image from Susan Tapert, PhD, University of California, San Diego.

How Long Does the Brain Remember?

Amygdala
not lit up

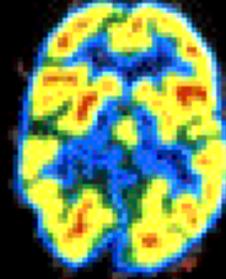
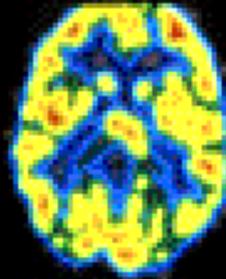
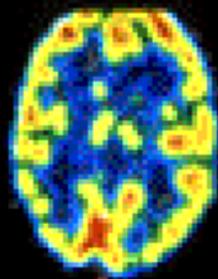
Amygdala
activated

Front of Brain

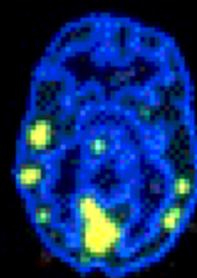
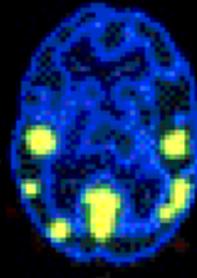


Nature Video

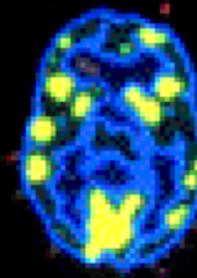
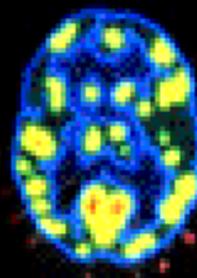
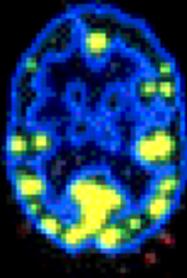
Cocaine Video



Normal



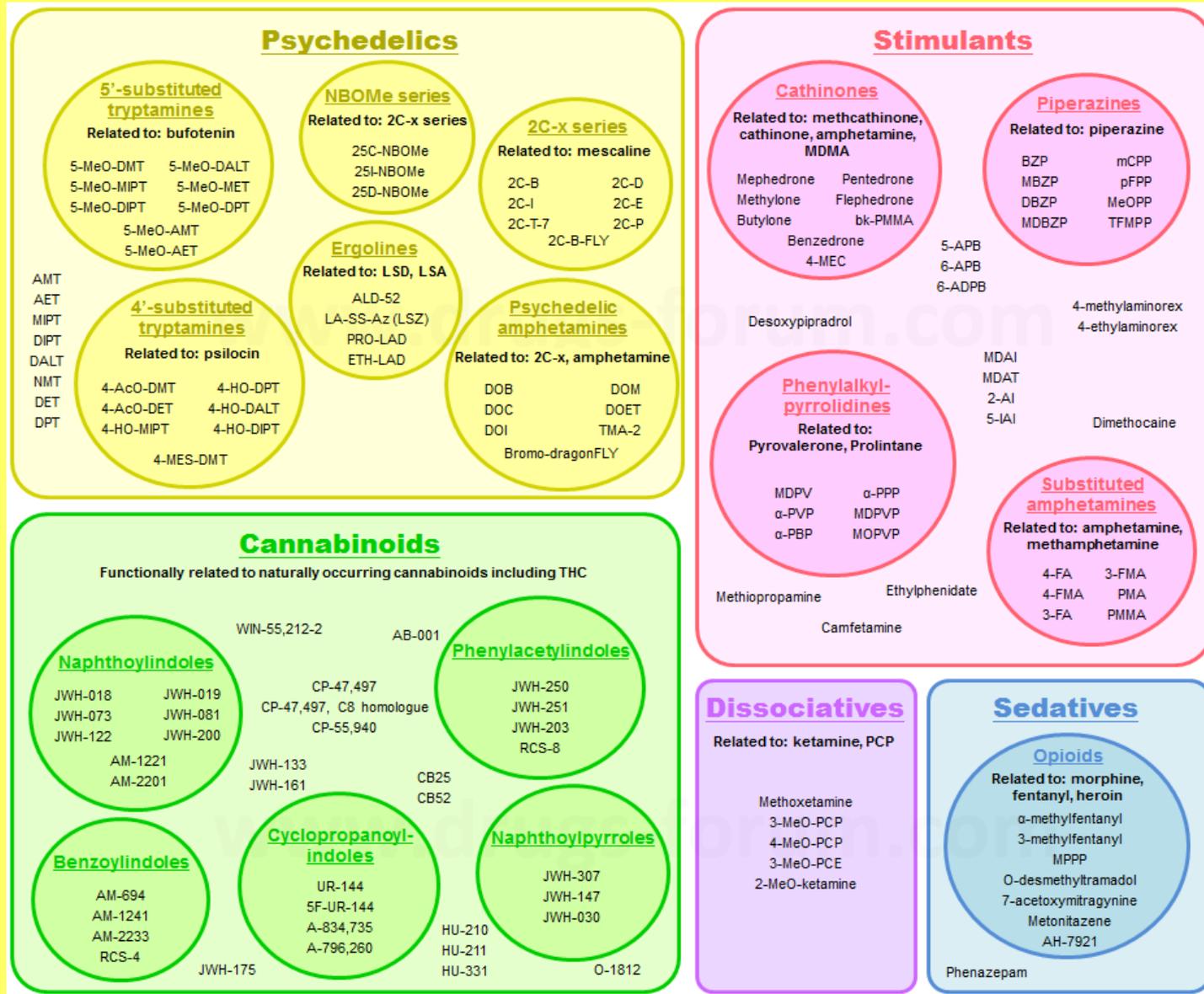
Cocaine Abuser (10 DA)



Cocaine Abuser (100 DA)



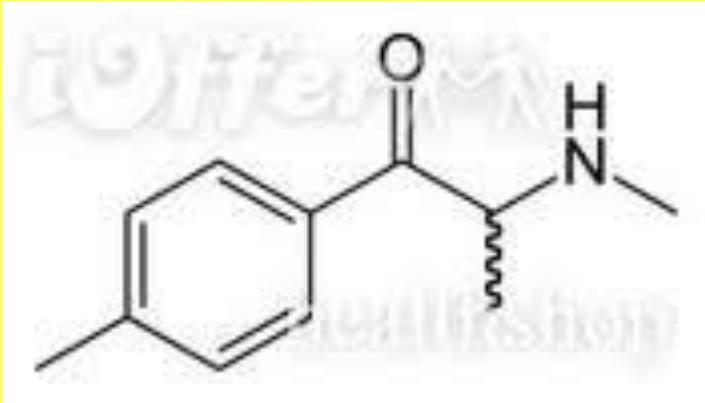
“Designer” Psychoactive Substances



Designer Drugs: Background

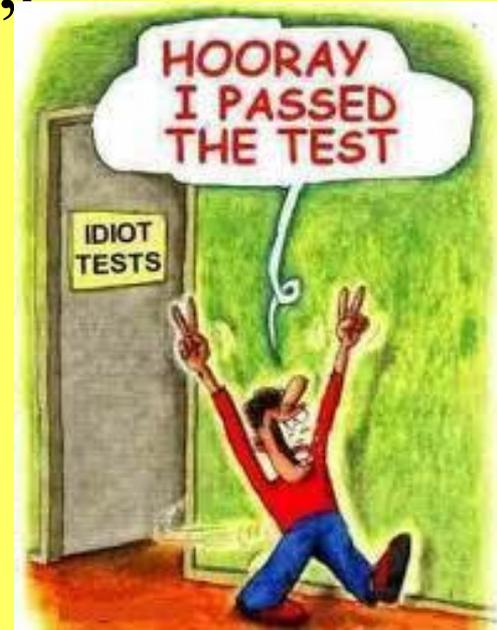
- Trend started in late 1970's
- Drugs of abuse are classified by DEA
- Drugs of abuse work according to structure
- Analogs
 - Can “design” an analog to have same or similar activity but not listed as a “controlled substance”
 - Not subject to legal penalties and restrictions

Mephedrone & Methamphetamine



Designer Drugs: Evolution

- Internationally do not have such laws
 - Being manufactured in other countries
- Many “designer drugs” do not test (+)
- A way to “Beat the Bladder Police”



K2 Products



Increased Hospitalizations due to Synthetic THC

- Several patients hospitalized
- Severe hallucinations, no gag reflex, difficult breathing
- Products included “Botanical Sachet”, “Sexy Monkey”, “Crazy Monkey”

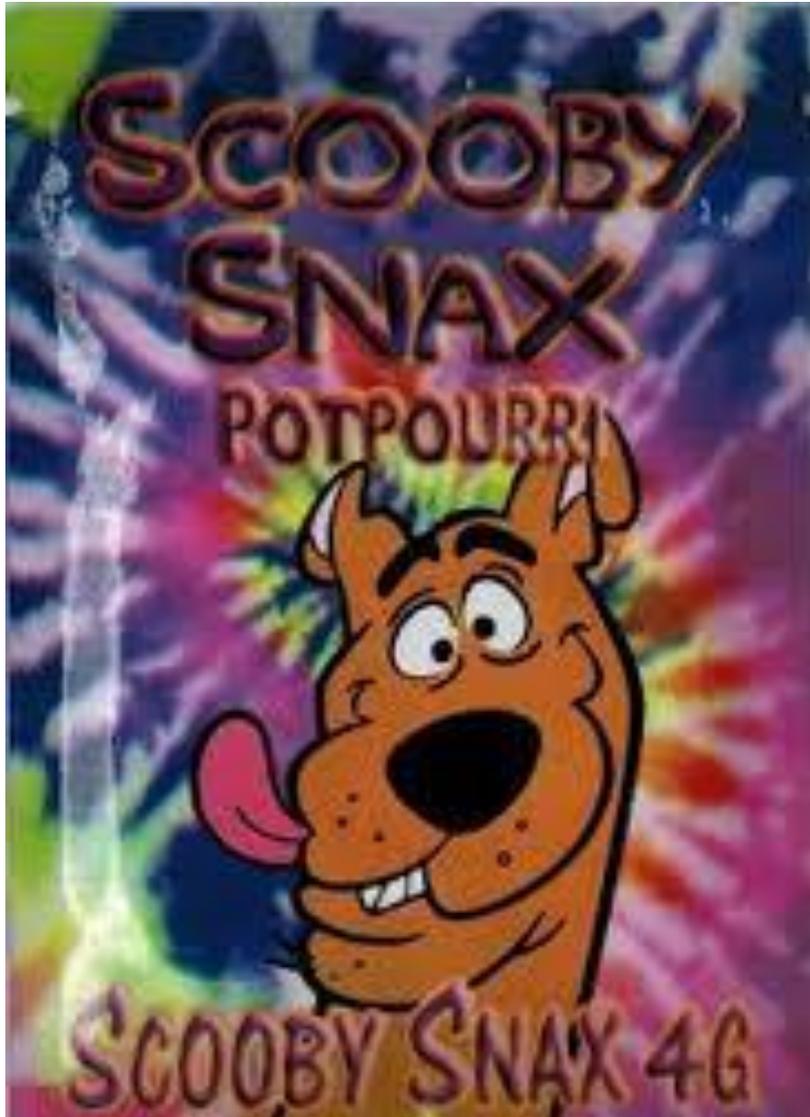
Synthetic Marijuana (JWH- 018)

K2 originated at Clemson University, where researchers developed synthetic cannabinoids in an effort to create therapeutic drugs. But the cannabinoids also have effects akin to THC, the key ingredient in marijuana

- K2 is largely created by individual sellers, it's anyone's guess what else is added to the mix.



Scooby Snacks: K2



Spice Withdrawal

- Unrest & Agitation
- Anxiety & Panic Attacks
- Tremors
- Heart Palpitations
- Nausea Vomiting
- Sweating
- Nightmares
- Cravings
- Depression



Kratom Pharmacology

- Mitragynine
- Structurally similar to some hallucinogens
- No hallucinogenic activity or effects
- Acts on opioid receptors

Kratom & Opioid Treatment

- Currently used for heroin and methadone dependence in some countries
 - New Zealand
 - Thailand
- Used in detox to manage withdrawal symptoms from opioids
- Millenium Labs announced test Aug. 2012

Kratom & Opioid Treatment

- www.bluelight.ru
 - Forum with much Kratom info
 - Participants using Kratom to wean off of oxy, heroin, Bup, etc.
 - Majority unable to wean off of Kratom
 - Descriptions of withdrawal
 - Descriptions of how to prepare & dosage
 - Descriptions of which to buy and where

Kratom Side Effects

- Short term (immediate)
 - Dry mouth
 - Increased or decrease urination
 - Loss of appetite
 - Nausea and/or vomiting
- Side effects
 - Anorexia/weight loss
 - Depression
 - Addiction



Kratom



•Kratom is often described as producing simultaneous, contradictory effects- both an opiate-like sedation and coca-like stimulation. The stimulating effects tend to predominate at low dose levels, which may cause alertness, energy, and mild euphoria. Higher level doses are usually more tranquilizing, causing an opiate-like dreamy effect. Excessive doses can cause severe nausea. As with opium, it is known for causing constipation, and is sometimes used as a treatment for diarrhea.

Onset

•When taken orally, the effects of kratom usually become noticeable in 15-20 minutes and clearly apparent in 30-60 minutes. Strong doses tend to have a more quicker, more dramatic onset.

Duration

•A moderate dose of kratom may cause strong effects that last 2-4 hours, with residual effects lasting hours longer.

2C-1 or “Smiles”

- Reports now in Mid-Atlantic states (Sept 2012)
- Prevalent on YouTube (users)
- Similar to a mix of ecstasy & LSD but with longer high & higher potency than either
- Unusual & unpredictable effects
- Not detectable like bath salts
- Potency not consistent from batch to batch

2C-1 or Smiles

- Usually sold in white powder form and can be melted into chocolate candy, but can also be taken as a tablet
- Also sold as breath mint or drops
- Both a hallucinogen and a stimulant- has been linked to recent teen deaths
- Can cause heart to beat out of control, seizures and foaming at the mouth

Kratom & E-Cigarettes

- **Kratomite**

Adventure Industries' Kratomite is the world's first electronic cigarette to deliver Kratom, a medicinal herb known for its concentration of alkaloids, according to the company. Kratom interacts with opioid receptors, which may offer users relaxing sensations. Unlike tobacco-alternative electronic cigarettes, Kratomite is a personal vaporizer that uses a proprietary, herbal-infused formula, said the maker.

Adventure Industries

Pembroke Park, Fla.

(800) 999-2483, ext. 1287

sales@adventureindustries.com



Bath Salts

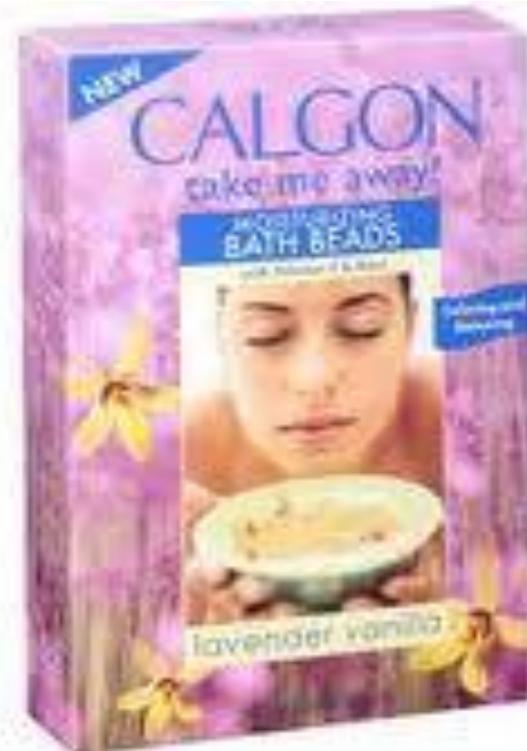


Mephedrone (4-Methylmethcathinone)



Bath Salts

- Toxic psychoactive drugs “disguised” or “pretending” to be “Bath Salts”
- They are NOT
- Some people have :



Bath Salts

- **“imitation cocaine or LSD”**
- **Not approved by FDA for human consumption**
- **Synthetic stimulants**
 - **Mephendrone**
 - **MDPV (methylenedioxypropylone)**
 - **Methylone**

Bath Salts

- Designated bath salts so they can be sold legally
- Effects
 - Agitation
 - Paranoia
 - Hallucinations
 - Chest pain
 - Increased BP and HR
 - Psychosis
 - Suicidality

Cathinones Toxic Effects

- Strong desire to re-dose, craving to recapture initial euphoric rush
- Uncomfortable changes in body temperature (sweating/chills)
- Heart palpitations, sense of racing heart
- Impaired short term memory
- Insomnia
- Skin lesions (?)

Cathinones Treatment Issues

- Similar to strong amphetamine addiction
- Similar to PCP abuse/addiction
- Non-psychotic withdrawal use Benzo's
- Stabilization and Safety highest priority
 - Safety of client
 - Safety of staff and others



Khat

- Native to tropical East Africa and the Arabian Peninsula
- Fresh Leaves/tops chewed or consumed as tea
- Stimulation and euphoria
- Part of social culture in many countries (coffee, tea, coca or khat)

Khat

- Coca -----cocaine
- Khat -----cathinone (Schedule I)
- Cathinones: Structure similar to amphetamines
 - Euphoria
 - Anorexia
 - Stimulation
 - Dilated pupils
 - Hypnagogic hallucinations when wearing off

Salvia Divinorum

■ Street Names:

- Salvia
- Sally-D
- Magic Mint
- Diviner's Sage
- Mexican Mint
- Maria Pastora
- Sage of the Seers
- Leaves of the Shepherdess



Salvia Divinorum

- Hallucinogenic herb closely related to the sage and mint families
- Indigenous to the State of Oaxaca in Mexico
- One of several “vision-inducing” plants employed by the Mazatec Indians living in northeastern Oaxaca



Salvia Divinorum

Effects - Short term (30 minutes maximum)

- **Start in**
 - 15 to 30 seconds after smoking
 - 4 to 10 minutes after chewing and holding in cheek
 - 20 to 30 minutes after oral ingestion
- **Psychoactive**
 - Similar to LSD
 - Visual hallucinations with bright lights, vivid colors and distortion of real images
- **Physical**
 - Lack of coordination
 - Dizziness
 - Slurred speech

Prescription and OTC Drugs

- Fastest growing problem in addiction
- Readily available by prescription or from someone's drug cabinet
- Having a prescription does not mean the drug is not addicting
- OTC drugs are considered safer but still a problem especially in adolescents
 - Antihistamines
 - Dextromethorphan
 - Coricidin

Pharming Parties or Trailmixing

- Everyone brings prescription or OTC drugs
- Pills placed in bowl
- Everyone grabs a handful of pills
- Alcohol may or may not be involved
- Preferred drugs are chlorpheniramine and dextromethorphan



Diphenhydramine Abuse

- High doses used for sleep or as sedative
- Hallucinations can occur at doses of 150-700 mg
- Can produce severe arrhythmias and add to sedative effect of other drugs or alcohol



What is **DXM**? **Dextromethorphan** is a psychoactive drug found in common over the counter cough medicines.



Dextromethorphan (DXM)

- Dextromethorphan's slang names include "Robo;" people refer to using DXM as "robo-tripping."
- At high doses, may produce dissociative hallucinations (distance from reality, visual effects with eyes open and closed; perceptual changes, drug liking, mystical-type experiences similar to use of psilocybin).
- Can also produce tachycardia, hypertension, agitation, ataxia, and psychosis at high doses.
- Users of DXM engage in "dose dependent" behaviors in which they try to gauge the amount of the drug they take to produce the desired effects, which they call "plateaus". Plateau is the mildest effect and the 5th plateau will guarantee a trip to the hospital.

“Eyeballing”

- Originated in England
- Vodka poured directly in eye
- Believed that the vodka is absorbed faster across the mucous membranes in eye and the blood vessels in eye
- Faster absorption does not occur
- Damage to eye can occur



“Sizzurp”

Cognac, Vodka, and Fruit Flavor



“In the news...”

- Alcohol Enemas - Butt Chugging
- Vodka soaked tampons



Vodka Gummy Bears



Put the bears/worms/fish into the glass dishes. Then pour in vodka until it reaches the top of the candy. Using that much vodka makes the candy swell and take on a noticeable but not unpleasant “burning” alcohol sensation. If you don’t want the alcohol that strong, use less vodka. (The amount of time you let the bears soak has no impact on how alcoholic they are. They will suck up nearly every drop of vodka you put in, so the trick is to use the right amount for your taste. You can always add more if you taste them after a day or so and think they’re not alcoholic enough.)

Hand Sanitizers

- Ingredients include isopropyl alcohol (70%)
- Target abusers
 - Inmates
 - Teenagers



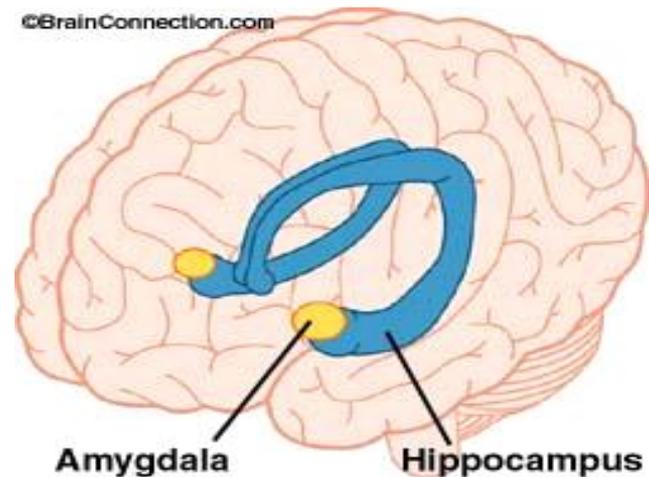
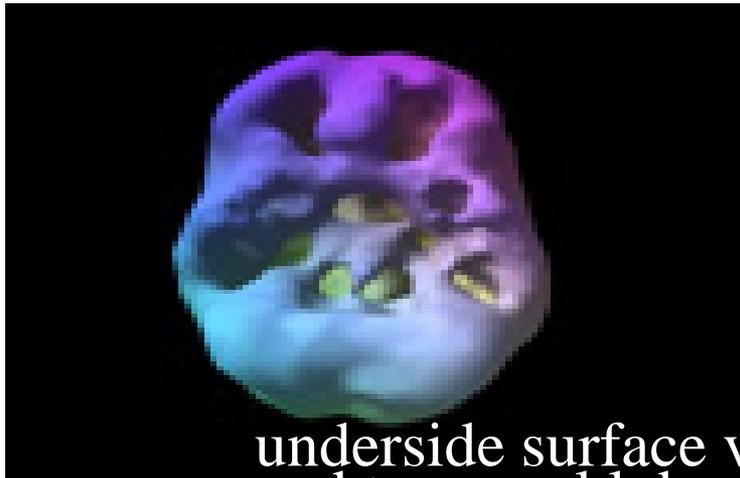
THC: Recreational vs Medical Use

- Difference in method of use
- Impurities in recreational marijuana (DuPont, 2000)
 - 400 different chemicals from 18 different chemical families
 - Smoke contains more than 2000 chemical compounds

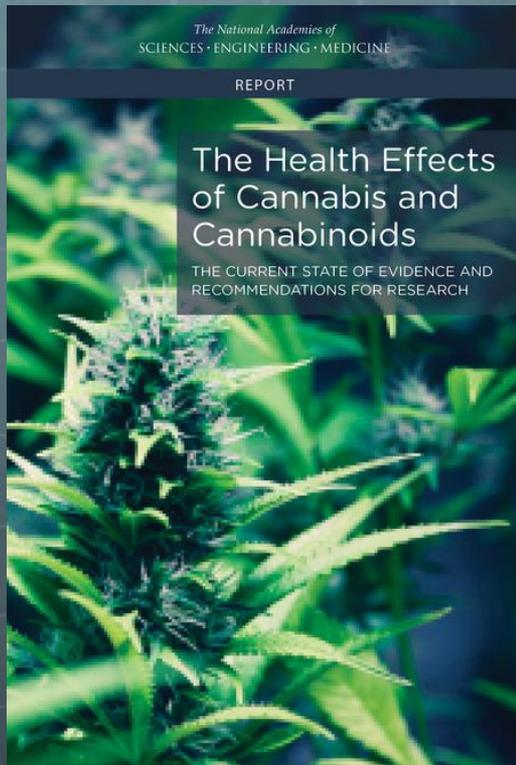
Impact of Daily Use

- MARIJUANA & Memory:

**16 y.o.
2 year history of daily
abuse**



NAS Report – released Jan 2017



PURPOSE: To provide a comprehensive review of the current evidence regarding the health effects of using cannabis and cannabis-derived products

Report made 4 recommendations.

Cannabinoids

- THC
 - psychoactive, euphoria, increased reaction time, loss of memory/cognitive functioning decreases, clearance half-life of less than 30 minutes and is not detectable in urine
- CBN
 - Pain relief, Anti-insomnia, Promotes growth of bone cells, Antibacterial, Anti-inflammatory, Anti-convulsive, Appetite stimulant
- CBD
 - may modify THC effects, inhibits conversion of THC to 11-OH-THC (CYP450), formation of CBD from THC does not occur by heat from smoking nor by human metabolism, blocks anxiety and psychological side effects produced by THC intake
- THC-COOH
 - Lipid soluble component (metabolite), can be stored in fat cells for weeks to months, found in blood and urine, typically appears in the urine within 60 minutes, but can take as long as 4 hours, presence of the major THC-COOH >LOQ indicates exposure to THC within 3 days after a single use, to approximately 30 days in heavy chronic users

Challenges of Using Cannabis

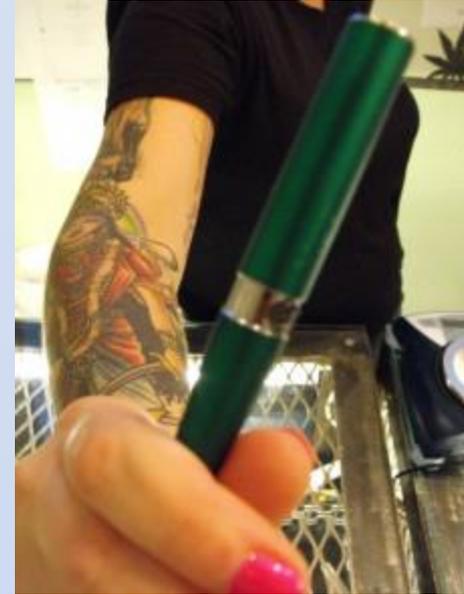
- Contaminants
 - Aspergillus fungus and bacteria - can lead to pneumonia
 - Heavy metals (aluminum, cadmium)
 - Organophosphate pesticides
 - Glass beads and sand in street cannabis -used to increase weight but can damage oral mucosa and lungs

Dabs, BHO, Honey, Budder

- Dabs, shatter wax and vaporizer pens contain hash oil (“wax”). Supposedly 80%-90% THC. Different methods available on the Internet.
- Butane Honey Oil or Butane Hash Oil is a golden resin created by placing dried and ground marijuana into a special pvc filter. Butane gas is shot in through one end of the filter while the other end is placed in a bowl full of water. The filter spews out the fresh oil in to the cold water where it sinks to the bottom. The bottom is scraped and the oil is ready to use.
- Users touch the heated knife point or the pin to the Budder on the end of a pin and inhale fumes (and sit down).

Vapor Pens

- Advertised for “patients”
- Cost \$100-\$200
- Potency varies
- Higher percentage of THC
- No odor. Similar to electronic cigarettes
- Pen-style vaporizers contain 100-150 hits
- Some can be recharged and refilled



MDMA (Ecstasy)

- 3, 4-methylenedioxy-methamphetamine
- Street terms: Adam, E, X, XTC, love drug, Molly
- A synthetic, psychoactive drug with both **stimulant** and **hallucinogenic** properties similar to methamphetamine and mescaline
- Adverse effects: **enhanced physical activity, sweating, lack of coordination, mental confusion, jaw clenching, hyperthermia, and agitation**

What is “Molly”?

1. Ecstasy pills with little MDMA and lots of caffeine with, assorted drugs? OR
2. A pure crystalline form of MDMA in powder filled capsule? OR
3. Methylone? Bath salts?

- Reports of hyperthermia, rhabdomyolysis, dehydration, agitation, delirium, hallucinations, seizures, panic episodes, violent or destructive self-harm behavior, including death

- Bottom line - Molly usually is not a pure form of MDMA, but may be a drug that can be very dangerous since its contents are unknown



But EMCDDA is now warning about emergence of very pure MDMA

Strawberry 'Meth'

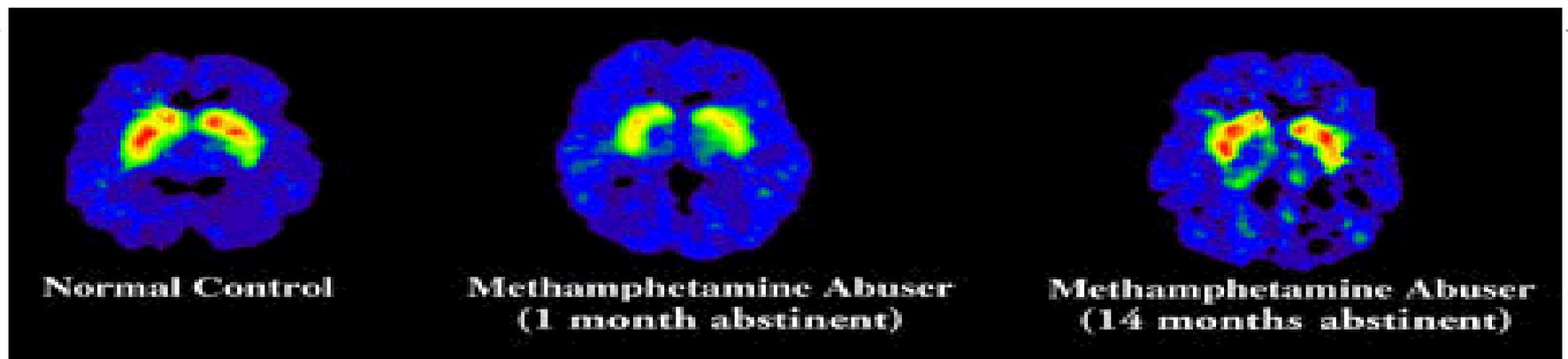
- Called 'Strawberry quick'
- Strawberry flavored and bright pink
- Perception that the colored version is less harmful
- Designed for the younger crowd



Blue Methamphetamine

- Smurf Dope
- Popularized by Breaking Bad
- Blue color is due to impurity (Chalk, dyes, other substances)
- Showing up in New Mexico
- Red version also available
- Form of branding

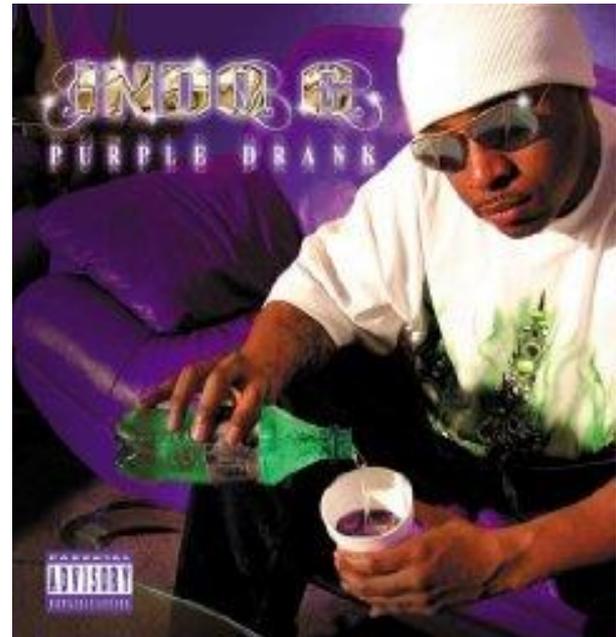




Brain images of a person who has never used methamphetamine (left) and of a methamphetamine user after 1 month of abstinence (center). Lighter colors show distribution of dopamine transporters (DAT) in the striatum. DAT distribution is reduced in striatum of methamphetamine user. Brain image of a methamphetamine user after 14 months' abstinence (right) shows substantial recovery of DAT in striatum. Low levels of DAT in methamphetamine users were associated with poorer performance on tests of memory and motor skills, which did not improve with DAT after lengthy abstinence.

Purple Drank

- Cough syrup (codeine based) + promethazine + Lemon-lime soda + ice + hard candies
- Effects
 - Profound CNS depression and sedation



Purple Drank

- Uses promethazine + codeine cough syrups
 - Usually diverted Schedule III cough syrup
 - Street value approximately \$250-400
- Plain codeine syrup can be used but not preferred
- Candies and lemon lime soda offset taste
- Believed to be best when served in foam cups
- Often referred to as Lean

Heroin

- White to dark brown powder or liquid the consistency of tar
- Street names
 - Smack
 - Horse
 - Brown sugar
 - Junk
 - Mud
 - Tootsie roll
 - Big H
 - Black tar



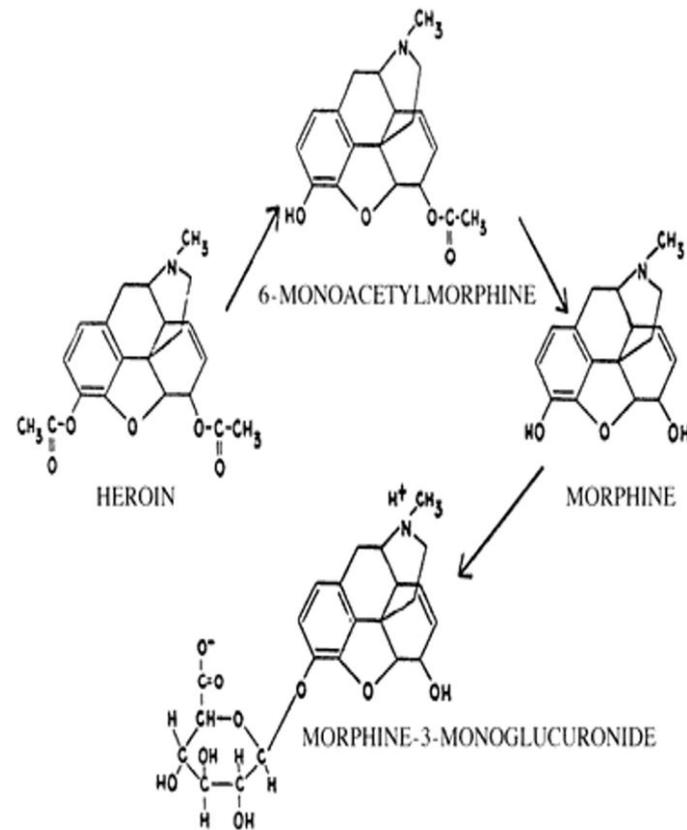
Starter Heroin (Cheese)



- Popular in middle and high schools
- Tylenol PM (Tylenol + Diphenhydramine) + heroin
- Typically ground up and folded in notebook paper or baggies
- \$2/hit or \$5/0.25 gram
- Samples have contained about 8%
- Usually snorted

Heroin: Pharmacology

- Undergoes 1st pass metabolism via deacetylation
- Prodrug for morphine
- Injection avoids 1st pass metabolism
 - Rapidly crosses blood brain barrier
 - More lipid soluble than morphine
- In brain, heroin is deacetylated into 6-monoacetylmorphine (6-MAM) and morphine



Killer Heroin

- Tainted heroin
- Laced with fentanyl
- May actually contain little or no heroin
- Brand names
 - “Bad News”
 - ”Theraflu”



Fentanyl – New strains

- Acrylfentanyl and tetrahydrouan fentanyl
- Can be absorbed through the skin
- Resistant to naloxone

Carfentanil

- Elephant tranquilizer
- Very potent – dose the size of grain of salt can be lethal
- Being added to clandestine pills (Xanax, Vicodin)
- Cut with heroin
- Can be absorbed through skin or inhaled
- Danger to first responders and law enforcement

Gray Death

- Combination of heroin, fentanyl, carfentanil, and U-47700 (synthetic opioid)
- Resembles concrete mix
- Varies from hard chunky material to fine powder
- More potent than heroin
- Injected, swallowed, smoked or snorted
- 50 overdoses in last 3 months in Georgia
- Can be absorbed through skin



Ambien

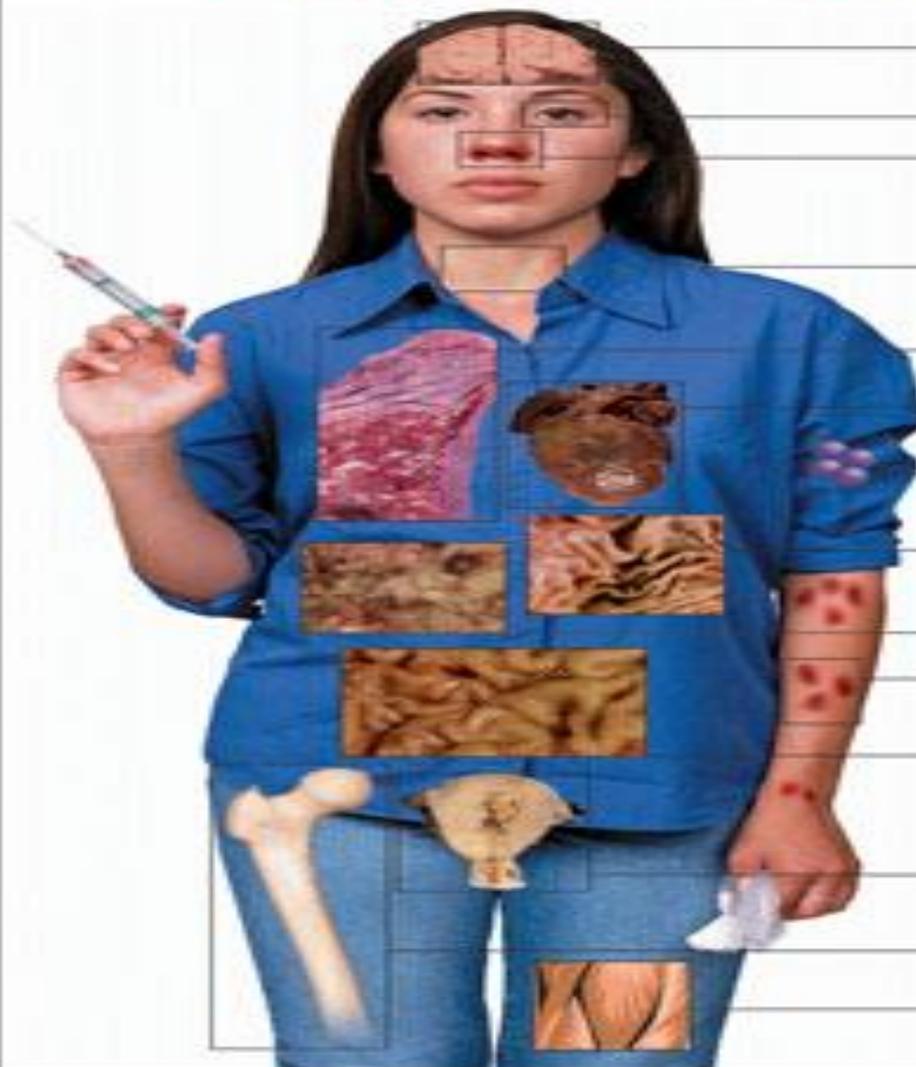
- Street names
 - A-Minus
 - Zombie Pills
- Use larger doses and resist urge to sleep
- Causes hallucinations and blackouts
- Date rapes can occur during blackouts
- Can cause fatalities especially if combined with alcohol
- Somnambulism (sleep walking and sleep driving) occurs with all related agents



Gabapentin (Neurotin)

- Not addictive by itself
- Used to stave off drug withdrawal
- Can bypass the blocking effects of medications used to treat addiction- allows patients to get high while in treatment
- Used to enhance the euphoria of opioids

HEROIN



HARMFUL EFFECTS

**BRAIN DAMAGE
ADDICTION
OVERDOSE**

**WATERY EYES
REDUCED VISION**

**IRRITATED
NOSTRILS
(FROM SNOORTING)**

**SWEATING
CHILLS**

**BREATHING
MAY STOP
COMA AND DEATH**

**HEART
INFECTIONS**

**INFECTIONS
(HIV, HEPATITIS
FROM SYRINGES)**

**LOSS OF APPETITE
VOMITING**

**HEPATITIS
LIVER DAMAGE**

**BRUISING
SORES
INFECTIONS
BLOOD CLOTS**

**ABDOMINAL PAIN
DIARRHEA
NAUSEA
CONSTIPATION**

**MISCARRIAGES
STILL BIRTHS
BIRTH DEFECTS**

**PAIN IN
BONES**

**MUSCLE
CRAMPS**

Krokodil

- **Desmorphine**
- **Derivative of codeine**
- **Contains numerous impurities – gasoline, paint thinner, lighter fluid, iodine, HCl, red phosphorus**
- **Very short half-life**







Krokodil: Effects

- Blood vessel damage
- Open ulcers, gangrene
- Skin and soft tissue infections
- Limb amputations
- Pneumonia
- Bone infections
- Impairment
- Liver and kidney damage



Benzo Fury

- Active ingredient is 5-APB
- Stimulant and hallucinogenic properties
- Fairly easy to buy via the Internet, at music festivals, and in clubs - priced at around \$15 per pill.
- User-reported effects include:
 - Increased happiness, euphoria, extreme mood lift, increased self-acceptance, increased intimacy, closed-eye hallucinations, increased sexual interest



New “Relaxation” Drinks: Drank and *Lean*

*Valerian
Roots*

Melatonin

Rose Hips

*“Slow Your
Roll”*

*“Slow
Motion
Potion”*



“Sizzurp”

Cognac, Vodka, and Fruit Flavor



Questions ??????

Thank You