

A vibrant nightclub scene with blue laser lights and silhouettes of people dancing. The background is filled with bright blue laser beams crisscrossing the room, creating a dynamic and energetic atmosphere. In the foreground, the dark silhouettes of people are visible, some with their arms raised, suggesting a dance floor. The overall color palette is dominated by deep blues and bright cyan highlights from the lasers.

# CLUB DRUGS

MARK ELLESTAD, MD  
COMPLIMENTS JONATHAN  
BUCHHOLZ, MD, FOR SLIDE USE

# GENERAL DISCLOSURES

The University of Washington School of Medicine also gratefully acknowledges receipt of educational grant support for this activity from the Washington State Legislature through the Safety-Net Hospital Assessment, working to expand access to psychiatric services throughout Washington State.

# CONFLICTS OF INTEREST?

- NONE!

# OBJECTIVES

- Review some common drugs of abuse popular among young adults
- Introduce some “newer” drugs of abuse
- Understand psychiatric manifestations of these substances of abuse
- Learn resources to use in order to stay current with evolving drug trends and newly synthesized drugs of abuse
- Questions, discussion

# DESIGNER DRUG

- Synthetic structural or function analogs of controlled substances designed to mimic the pharmacological effects of the original drug while avoiding illegality

# REASONS FOR USE

- Often Legal
- Often Less expensive
- More readily available
- More desirable pharmacological effects

# CHALLENGES TO THIS TOPIC

## Psychedelics

### 5'-substituted tryptamines

Related to: bufotenin

5-MeO-DMT    5-MeO-DALT  
 5-MeO-MIPT    5-MeO-MET  
 5-MeO-DIPT    5-MeO-DPT  
 5-MeO-AMT  
 5-MeO-AET

### NBOMe series

Related to: 2C-x series

25C-NBOMe  
 25I-NBOMe  
 25D-NBOMe

### 2C-x series

Related to: mescaline

2C-B            2C-D  
 2C-I            2C-E  
 2C-T-7        2C-P  
 2C-B-FLY

### Ergolines

Related to: LSD, LSA

ALD-52  
 LA-SS-Az (LSZ)  
 PRO-LAD  
 ETH-LAD

### Psychedelic amphetamines

Related to: 2C-x, amphetamine

DOB            DOM  
 DOC            DOET  
 DOI            TMA-2  
 Bromo-dragonFLY

### 4'-substituted tryptamines

Related to: psilocin

4-AcO-DMT    4-HO-DPT  
 4-AcO-DET    4-HO-DALT  
 4-HO-MIPT    4-HO-DIPT

4-MES-DMT

AMT  
 AET  
 MIPT  
 DIPT  
 DALT  
 NMT  
 DET  
 DPT

## Cannabinoids

Functionally related to naturally occurring cannabinoids including THC

### Naphthoylindoles

JWH-018    JWH-019  
 JWH-073    JWH-081  
 JWH-122    JWH-200

AM-1221  
 AM-2201

### Benzoylindoles

AM-694  
 AM-1241  
 AM-2233  
 RCS-4

WIN-55,212-2

AB-001

CP-47,497  
 CP-47,497, C8 homologue  
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JWH-133  
 JWH-161

CB25  
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### Cyclopropanoyl-indoles

UR-144  
 5F-UR-144  
 A-834,735  
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### Phenylacetylindoles

JWH-250  
 JWH-251  
 JWH-203  
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### Naphthoylpyrroles

JWH-307  
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HU-210  
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 HU-331

O-1812

## Stimulants

### Cathinones

Related to: methcathinone, cathinone, amphetamine, MDMA

Mephedrone    Pentedrone  
 Methylone    Flephedrone  
 Butylone      bk-PMMA  
 Benzedrone  
 4-MEC

### Piperazines

Related to: piperazine

BZP            mCPP  
 MBZP        pFPP  
 DBZP        MeOPP  
 MDBZP      TFMPP

5-APB  
 6-APB  
 6-ADPB

4-methylaminorex  
 4-ethylaminorex

Desoxypipradrol

### Phenylalkyl-pyrrolidines

Related to: Pyrovalerone, Prolintane

MDPV             $\alpha$ -PPP  
 $\alpha$ -PVP          MDPVP  
 $\alpha$ -PBP          MOPVP

Methiopropamine

Ethylphenidate

Camfetamine

MDAI  
 MDAT  
 2-AI  
 5-AI

Dimethocaine

### Substituted amphetamines

Related to: amphetamine, methamphetamine

4-FA            3-FMA  
 4-FMA        PMA  
 3-FA            PMMA

## Dissociatives

Related to: ketamine, PCP

Methoxetamine  
 3-MeO-PCP  
 4-MeO-PCP  
 3-MeO-PCE  
 2-MeO-ketamine

## Sedatives

### Opioids

Related to: morphine, fentanyl, heroin

$\alpha$ -methylfentanyl  
 3-methylfentanyl  
 MPPP  
 O-desmethyltramadol  
 7-acetoxymitragynine  
 Metonitazene  
 AH-7921

Phenazepam

# SUBSTANCES COVERED TODAY

- Synthetic Marijuana (Spice)
- Synthetic Cathinones (Bath Salts)
- MDMA (Ecstasy)
- Others
  - Piperazines
  - 2C series
  - DXM (Dextromethorphan)
  - “Syrup”
  - GHB
  - Kratom



# HOW DO I ASK MY PATIENTS ABOUT SUBSTANCES?

- Do you use any substance to change the way you feel or enhance your experiences?
- What is it? What does it do for you?
- What's the newest thing?



# Spice



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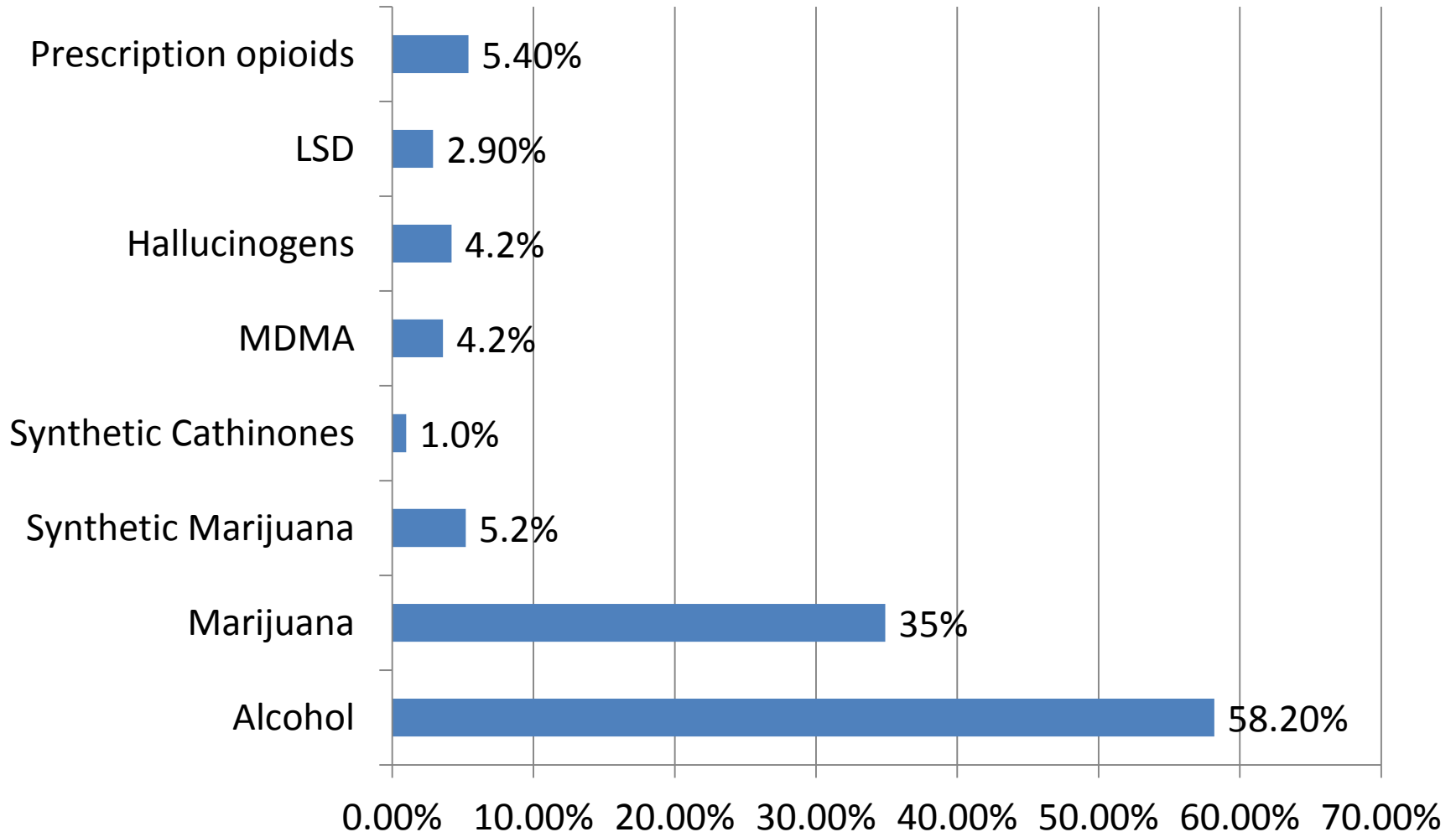
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# PAST YEAR DRUG USE BY 12<sup>TH</sup> GRADE STUDENTS



# SPICE = SYNTHETIC CANNABINOIDS

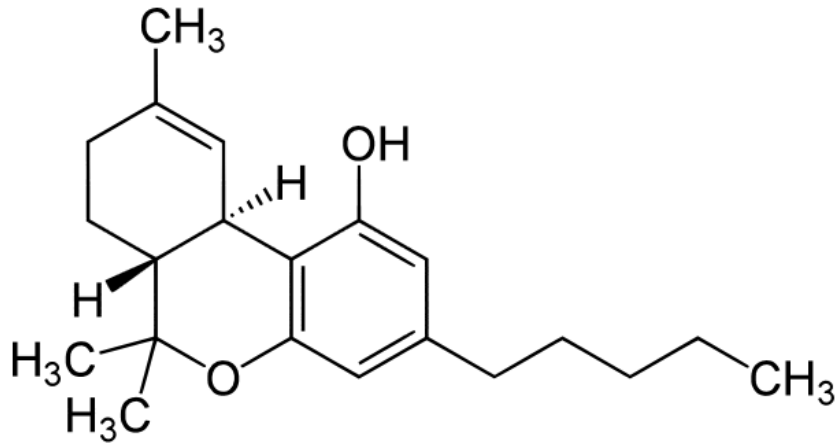
- Herbal mixtures sprayed with chemical additives
  - “Spice”
  - “K2”
  - “Yucatan Fire”
  - “Skunk”
  - “Moon Rocks”
  - “Crazy Clown”
  - “Herbal Madness”
- Sold as
  - Potpourri
  - Incense
  - Air Fresheners
  - Obtained online, head shops, or gas stations/convenience stores
- Route of administration similar to marijuana

## Why People Use It?

- The expectation of a more intense high
- Easy access
- Belief it is safe
- Avoid detection

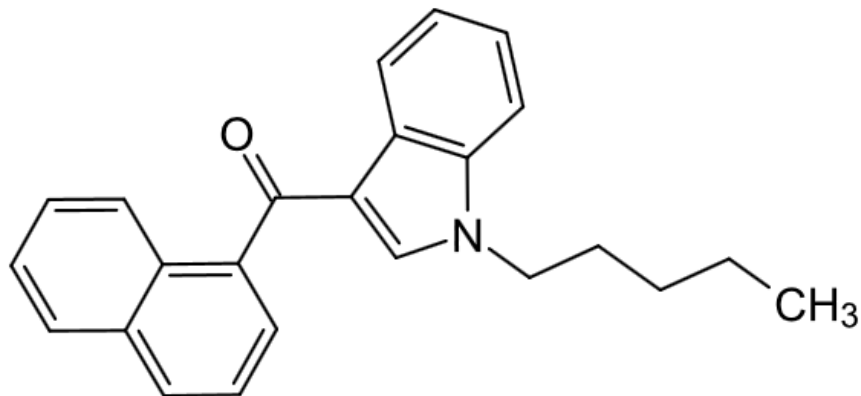
# Tetrahydrocannabinol

Binding affinity for CB1 K: 40.7 nM



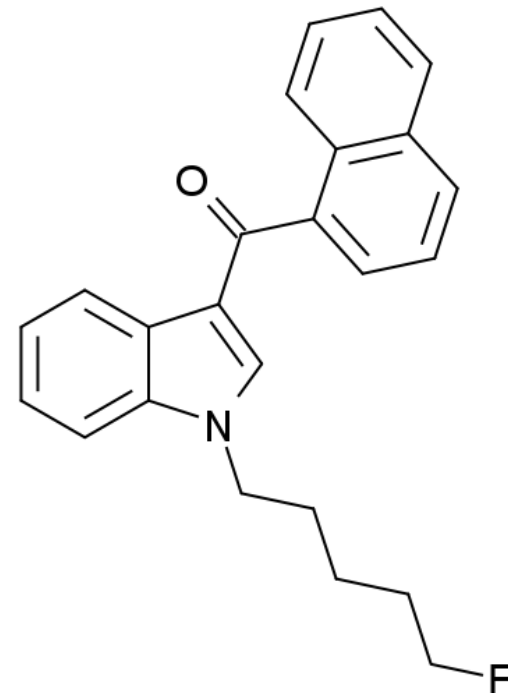
# JWH-018

Binding affinity CB1: 9 nM



# AM-2201

Binding Affinity for CB1: 1.0 nM



All lipid soluble and  
highly volatized

# Synthetic Cannabinoids

- Psychoactive effects – within minutes lasting up to 8 hours
  - Euphoria
  - Psychosis (9.4%-38%)
    - Visual
    - Altered perception of time
  - Anxiety
    - Panic
  - Agitation (23.4%)
  - Memory changes
  - Sedation (13.6%)
  - Confusion (12%)



# Medical Consequences

- Cardiovascular
  - Chest pain
  - Tachyarrhythmia
  - Cardiotoxicity
  - Tachycardia (40%)
  - Hypertension (8.1%)
  - Dizziness (7.3%)
- Gastrointestinal
  - Nausea
  - Vomiting
  - Hyposalivation
  - Xerostomia
- Renal
  - Acute kidney injury
- Other
  - Seizures-status epilepticus
  - Somnolence, dilated pupils, brisk reflexes
  - Appetite changes
  - Stroke

## Tolerance, Withdrawal and Dependence

- Cravings, restlessness, NMs, sweating headache, nausea, and tremor



# Diagnosis and Treatment

- Gas chromatography-mass spectrometry at selected labs
- Treatment is supportive
  - IVF
  - Calm setting
  - Benzodiazepines
  - Antipsychotic drugs prn

# SYNTHETIC CATHINONES (BATH SALTS)

## Sinus Aromatherapy for the Bath

Helps ease head and chest discomfort

**Directions:** Sprinkle a handful

into running water

Ingredients: Sea Salt, Eucalypti Leaf, Orange Oil,  
Essential Oil: Peppermint, Rosemary and Lemongrass

Low Jane Mills - Rockwood Crafts  
28 North Hill Acres - Greenville, AL 37208

lowjanemills@yahoo.com  
<http://www.rockwoodcrafts.com>

## Sleepy Time Aromatherapy for the Bath

Thought to help aid sleeping

**Directions:** Sprinkle a handful under  
running water

Ingredients: Sea Salt, Eucalypti Leaf, Orange Oil,  
Essential Oil: Lavender, Chamomile and Ylang

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## Headache Relief Aromatherapy for the Bath

Thought to help with headaches

**Directions:** Sprinkle a handful under

running water

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Essential Oil: Peppermint and Eucalyptus

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## Relaxation Aromatherapy for the Bath

Thought to help with well being

**Directions:** Sprinkle a handful under

running water

Ingredients: Sea Salt, Eucalypti Leaf, Orange Oil,  
Essential Oil: Sandalwood, Ylang, and Lemongrass

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## Stress Relief Aromatherapy for the Bath

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running water

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Essential Oil: Basil, Eucalyptus, Lemongrass, and Ylang

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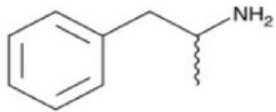
Phenazepam

# COMMON BATH SALT NAMES

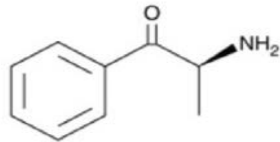
- Meow meow
- Bubbles
- Cat
- Jeff
- Bliss
- Blue silk
- Cloud nine
- Drone
- Ivory wave
- Lunar wave
- Ocean burst
- Pure ivory
- Purple waves
- Red dove
- Snow leopard
- Stardust
- Vanilla sky
- White night

# BATH SALTS = SYNTHETIC CATHINONES

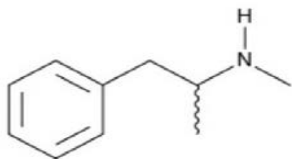
- Similar to other stimulants
  - Increase synaptic concentration of amines: NE, DA, 5HT



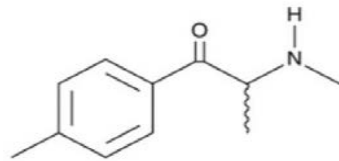
amphetamine



cathinone



methamphetamine



mephedrone

Khat



## Why People Use It?

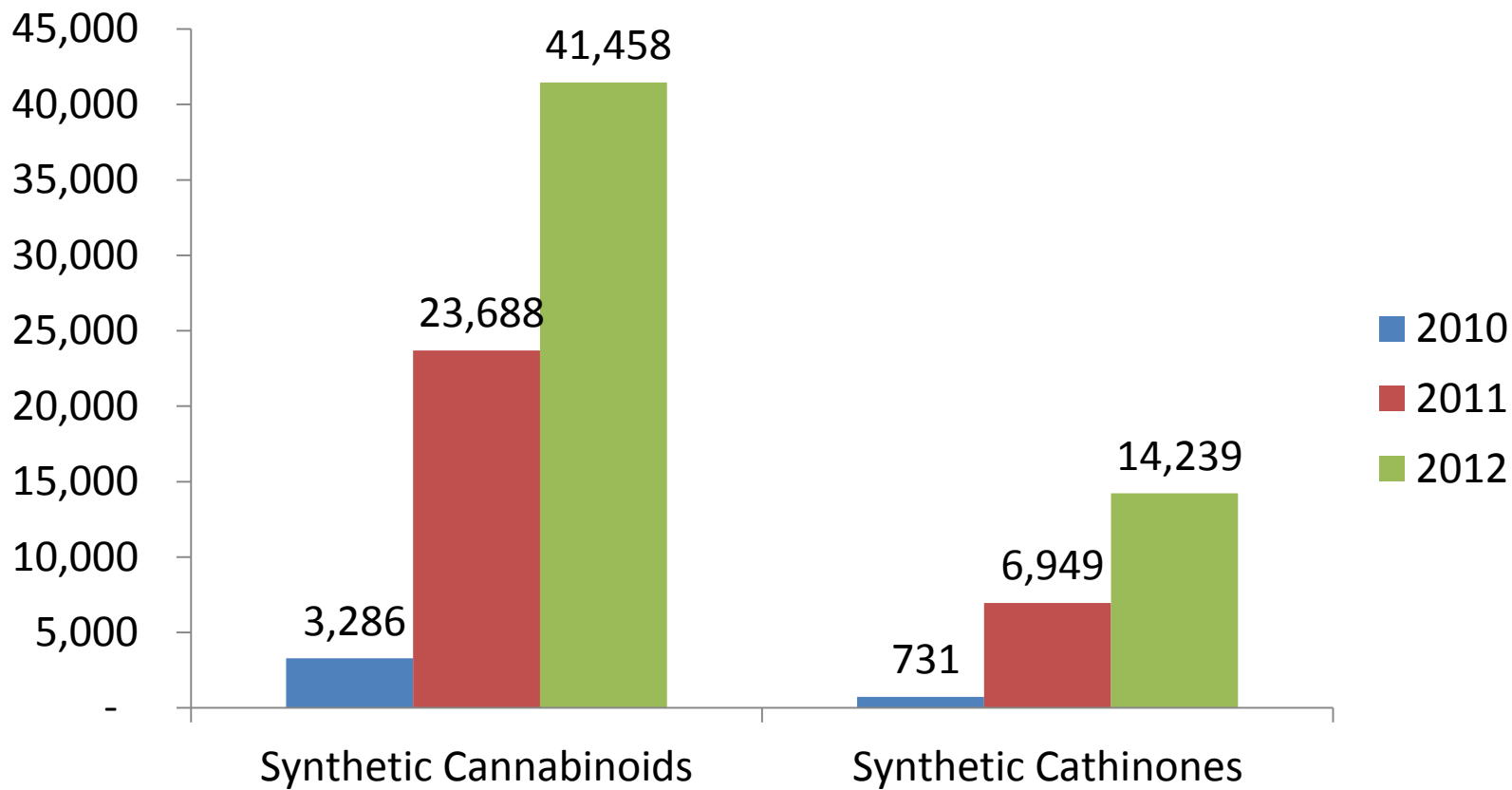
- Easy access – Internet head shops
- Avoid detection
- Potential for more intense high

# BATH SALTS = SYNTHETIC CATHINONES

- Typically white powder in small packets of 500mg-1gm for about \$25
- Average dose: few milligrams to >1gm
- Duration 2-3 hours
- Frequency 2-10+ per day
- Use
  - Nasal snorting
  - “Bombing”
  - “Keying”
  - Other: rectal, IV, IM, gingival, inhale



# EMERGING DRUG ITEMS IDENTIFIED IN U.S. NFLIS FORENSIC LABS: 2010-2012



# CLINICAL SYMPTOMS OF SYNTHETIC CATHINONE USE IN PATIENTS ADMITTED TO THE EMERGENCY DEPARTMENT (N=236)

Agitation	82%
Combative/Violent behavior	57%
Tachycardia	56%
Hallucinations	40%
Paranoia	36%
Confusion	34%
Myoclonus/Movement disorders	19%
Hypertension	17%
Chest pain	17%
CPK elevations	9%



# QUESTION: DIAGNOSIS

- Clinical presentation
- Urine drug screen is not reliable
  - Even with specific screening most labs test only for Methylenedioxypropylamphetamine (MDPV)
  - Sometimes false positive for methamphetamine
- History from patient and collateral sources

# CAUSATION: TREATMENT

- Supportive
  - Cardiac, Renal, Hyponatremia may necessitate hospitalization
  - Psychiatric may necessitate hospitalization for safety
    - Agitation: Benzodiazepines
    - Hallucinations: low-dose antipsychotics for hallucinations (Risperidone 1mg)
      - Avoid aggressive use of antipsychotics due to increased morbidity
- Monitor for vitals/lab abnormalities
  - Hyperthermia, dehydration, Renal function



MDMA – Ecstasy

# MDMA (ECSTASY)

- 3, 4-methylenedioxy-methamphetamine
- Street terms: Adam, E, X, XTC, love drug, Molly
- Cost per pill ranged from \$3-\$30
- Synthetic psychoactive drug
  - Both stimulant and hallucinogenic properties similar to methamphetamine and mescaline
- INCREASES DA, 5-HT, and NE
  - Inhibits 5-HT, DA, and NE reuptake, reverses transporters, decreases MAO activity
  - Releases 1.5 times more 5-HT than DA, more potent as 5-HT transporter inhibitor
- Releases oxytocin via directly and indirectly agonizing 5-HT → entactogenic

# WHAT IS “MOLLY”

1. Ecstasy pills with little MDMA and lots of caffeine, meth, assorted drugs? OR
  2. A pure crystalline form of MDMA, most often sold as a powder filled capsule? OR
  3. Methylone/Bath salts?
- Reports of desired effects of euphoria, but also increased paranoia, agitated delirium, scary hallucinations, psychotic episodes, violent or destructive self-harm behavior, including death
  - Molly usually is not a pure form of MDMA, but may be a drug that can be very dangerous since its contents are unknown



# MDMA (ECSTASY)

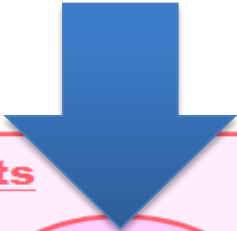
- Adverse effects:
  - ***Serotonin Syndrome***
  - Sweating, hyponatremia
  - Decreased coordination
  - Jaw clenching
  - Agitation
  - Hyperthermia
  - Rhabdomyolysis
  - hepatotoxicity

## Mortality

- 1997-2007 in the UK there were 605 deaths related to MDMA
- Polydrug use a large factor
- Hyperthermia related: 40-43°C (104-109), multiple organ failure
  - Induces apoptosis in cultured liver cells, acute liver failure
- Cardiac arrest
- Seizure
- Rhabdomyolysis

# MDMA Diagnosis & Treatment

- Serum and urine assays for MDMA
  - Negative test cannot confirm symptoms are result of MDMA toxicity
- Treatment for toxicity
  - ED Referral
  - Symptomatic care
    - IVFs, Oxygen
    - HTN-benzos 1<sup>st</sup> line and usually sufficient
    - Agitation-benzos
    - Psychosis-
  - Monitor
    - Serial neurological checks
    - Telemetry
    - Labs-Glucose, Renal/Liver
    - Urine output
  - Cool core temperature
  - Seizure treatment with benzodiazepines
  - Activated charcoal for ingestion within 1 hour



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JWH-175

### Phenylacetylindoles

JWH-250  
JWH-251  
JWH-203  
RCS-8

### Naphthoylpyrroles

JWH-307  
JWH-147  
JWH-030

HU-210  
HU-211  
HU-331

O-1812

## Stimulants

### Cathinones

Related to: methcathinone, cathinone, amphetamine, MDMA

Mephedrone    Pentadrone  
Methylone    Flephedrone  
Butylone      bk-PMMA  
Benzedrone  
4-MEC

Desoxypipradrol

### Phenylalkyl-pyrrolidines

Related to: Pyrovalerone, Prolintane

MDPV             $\alpha$ -PPP  
 $\alpha$ -PVP            MDPVP  
 $\alpha$ -PBP            MOPVP

Methiopropamine

Ethylphenidate

Camfetamine

### Piperazines

Related to: piperazine

BZP            mCPP  
MBZP        pFPP  
DBZP        MeOPP  
MDBZP      TFMP

5-APB  
6-APB  
6-ADPB

4-methylaminorex  
4-ethylaminorex

MDAI  
MDAT  
2-AI  
5-AI

Dimethocaine

### Substituted amphetamines

Related to: amphetamine, methamphetamine

4-FA            3-FMA  
4-FMA        PMA  
3-FA            PMMA

## Dissociatives

Related to: ketamine, PCP

Methoxetamine  
3-MeO-PCP  
4-MeO-PCP  
3-MeO-PCE  
2-MeO-ketamine

## Sedatives

### Opioids

Related to: morphine, fentanyl, heroin

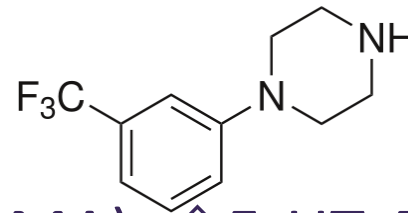
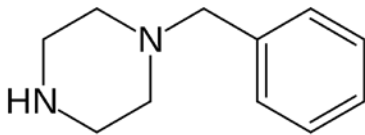
$\alpha$ -methylfentanyl  
3-methylfentanyl  
MPPP  
O-desmethyltramadol  
7-acetoxymitragynine  
Metonitazene  
AH-7921

Phenazepam



# PIPERAZINES

- Street Names:
  - “Frenzy”
  - “Charge”
  - “Herbal ecstasy” or “Legal X”
  - “A2”
- Two classes:
  - benzylpiperazines (BZP) and phenylpiperazines (TFMPP)



- Mimics effects of ecstasy (MDMA): ↑ 5-HT, DA, NE
  - Particularly dangerous if mixed: seizures and coronary syndromes

## Adverse Events

- HTN/Tachycardia
- Reduced consciousness
- Psychosis
- Hyperthermia/coma

# Dextromethorphan - DXM



# DEXTROMETHORPHAN (DXM)

- Dissociative hallucinations
  - distance from reality
  - visual effects
  - perceptual changes
  - mystical-type experiences similar to psilocybin.
- Tachycardia, hypertension, agitation, ataxia, and psychosis at high doses; need to be careful of serotonin syndrome
- OTC often found in combination
  - Acetaminophen
  - Diphenhydramine
  - Phenylephrine or pseudoephedrine
  - Alcohol
- Monitoring the Future survey 2011
  - 5% of 12 graders used in the past 12 months

# DEXTROMETHORPHAN (DXM)

- Street names include
  - “Robo” or act of using “Robo-tripping”
  - Triple Cs
- “Plateaus”
  - Darkridge.com – street lore regarding different levels of high
    - **“1st plateau (100-250mg):** Great for conversation, yet can be a powerful trip. It all depends on the mindset. Usually one is very empathetic, and has great insights to everything”
    - **“2nd plateau (250-450mg):** All the effects of the 1st plateau are present, with the addition of more euphoria, a decreased sense of time and a decreased sense of surroundings.”
    - **“3rd plateau (450-800mg):** Many of the effects of the first two plateaus are present + Visual (closed-eye-visual, mostly) hallucinations. Insights are extraordinary. “
    - **“4th plateau (800-1800mg):** The highway can be crossed at this plateau. What is on the other side of the highway could be anything. Alien encounters, out of body experiences, etc. are not uncommon.”

# “SYRUP” OR SIZZURP

- Codeine + Promethazine cough syrup
- Cut with jolly ranchers/flavoring, and soft drink
- Sedation, pain relief, euphoria
  - Promethazine potentiates the codeine
- Hip-Hop/Rap music phenomenon
  - Pimp C – death 2008 associated
  - Lil Wayne - continues to struggle



# GAMMA HYDROXYBUTYRATE (GHB)

- 2 types of users
  - Body builders, self-med: depression, anxiety, insomnia
  - Recreationally: clubs, socially - enhancement of sexual experience/aphrodisiac
  - Will use concurrently with MDMA, cocaine, alcohol, methamphetamine
  - Higher use among young club goers

# GAMMA HYDROXYBUTYRATE (GHB)

- Acute Intoxication
  - Unpredictable product, steep dose-response curve → difficult to titrate dose and overdose is common
  - Vitals: hypotension, bradycardia, decreased respiratory rate, hypothermia
  - CNS: Coma (within 15 minutes)
    - Agitation: including self-injurious behaviors
    - Amnesia
    - Seizure/seizure-like: myoclonus,
    - Ataxia, disconjugate gaze
  - Respiratory depression
  - CV: brady and hypotension, arrhythmias
  - GI: vomiting, incontinence



# WHAT DO YOU DO IF SOMEONE HAS TAKEN AN UNKNOWN DRUG?

- Call your local poison center at 1-800-222-1222
  - 57 poison centers around the country have experts waiting to answer your call.
  - The experts at the Center can help you decide whether someone can be treated at home, or whether he or she must go to a hospital.
- Dial 9-1-1 immediately if they:
  - Stop breathing
  - Collapse
  - Have a seizure

...or if they have taken one of these and are having physical symptoms or behaving in a way that is concerning to you



## For More Information

<http://www.teens.drugabuse.gov/>

<http://www.drugabuse.gov/drugs-abuse/club-drugs>

<http://drugpubs.drugabuse.gov/promotions/back-to-school>

<http://www.samhsa.gov/>

**SPECIAL THANKS – MARK DUNCAN,  
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