


**Emerging Drugs of Abuse:
Herbal Incense, Bath Salts
& Purple Drank**




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***** WEBINAR SERIES 2013

Presented by:
J. Randall Webber, MPH, CADC
JRW Behavioral Health Services

August 14, 2013 – The presentation will begin soon.

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Services




*I don't think we're in
Kansas anymore*

- Dorothy to Toto, "Wizard of Oz"

Our Agenda

- Synthetic cannabinoids ("K2" / "Spice")
- Synthetic cathinones ("Bath Salts")
- "Purple Drank"





Currently Available Legal Substances

- Herbal Incense ← "Not for Human Consumption"
- "Bath Salts" ←
- Salvia


Herbal Incense


Section One


Herbal Incense

- Crushed, non-psychoactive herbal/plant matter treated with one or more synthetic cannabinoids
 - First Generation: "K2," "Spice," "Black Mamba," "Red Dragon"
 - Second Generation: "K3," "Splice," "Apocalypse," "Destiny," "Cloud Ten," "Head Trip," house mixes



 **Current Legal Status of "First Generation" Herbal Incense**

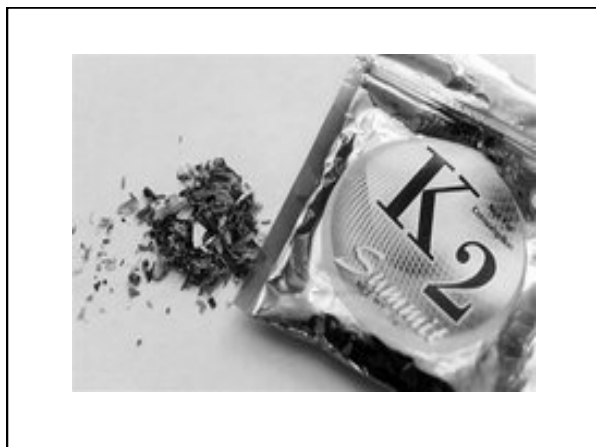
- 2011: Drug Enforcement Administration (DEA) emergency scheduling authority makes five chemicals (JWH-018, -073, -200, CP-47,497, and cannabicyclohexanol) now illegal for at least one year
- DEA and the U.S. Department of Health and Human Services (DHHS) to study whether these chemicals and products should be permanently controlled.
- August 2012: All synthetic cannabinoids placed in Schedule I

 **Banned Herbal Incense Brands**


➤ Frequently marketed as "incense" under a variety of names:

- K2
- Spice/Spice Gold
- Arctic Synergy
- Black Mamba
- Yucatan Fire
- Red Dragon
- Genie
- Blaze
- Red X
- Dawn

Banned Herbal Incense Products







New Herbal Incense Brands

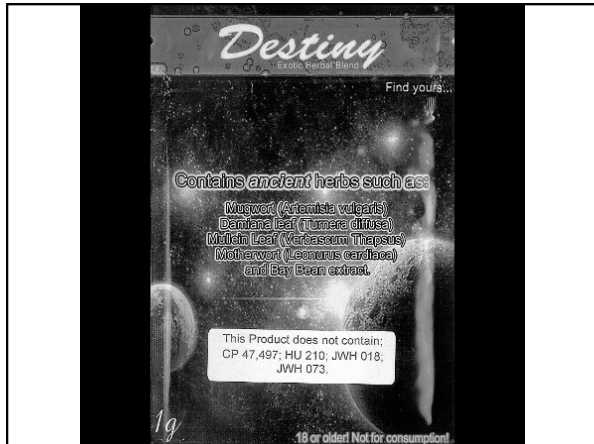
- K2
- K3
- Destiny
- Splice
- Apocalypse
- Cloud Ten
- Head Trip
- "House Blends"



Apocalypse Flavors

- BLUEBERRY
- STRAWBERRY
- JUNGLE JUICE
- CHERRY
- COTTON CANDY
- COCONUT
- LEMON
- LIME
- SPEARMINT
- ROOT BEER
- BANANA
- BUBBLE GUM
- ORANGE
- COCA COLA
- "JOOSY FRUIT"
- RASPBERRY
- PEACH
- APPLE
- CHOCOLATE
- GRAPE
- WATERMELON
- PINEAPPLE
- MANGO



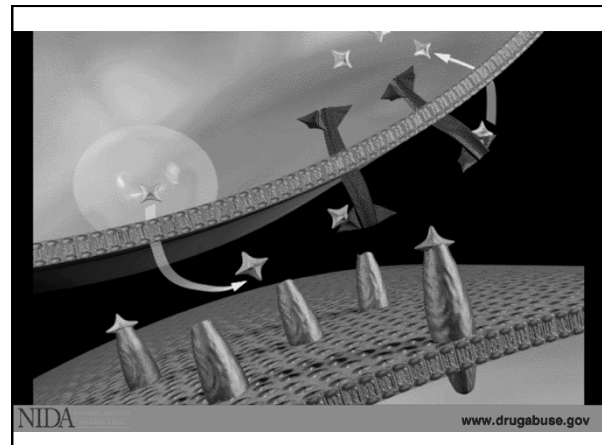


Herbal Incense Pharmacology

- Hundreds of synthetic cannabinoids (similar to both Δ9-THC and endogenous cannabinoids) have been created
- Potency ranges from hundreds of times *more* potent than THC to over 1000x *less* potent
- Most common psychoactive ingredients in herbal incense was "JWH-018" (1-pentyl-3-[1-naphthoyl]indole)
- Synthesized in 1995 by Dr. John W. Huffman at Clemson University

Herbal Incense Pharmacology

- Research supported by NIDA
- Two cannabinoid receptors in the human brain, CB₁ and CB₂
- CB₂ affects inflammatory pain and was the focus of NIDA study
- JWH-018 targets both receptors
- Huffman: "JWH-018 easiest to make outside a lab, requiring only two steps involving commercial products"
- Transferring the JWH to the botanical product involves using acetone




A Historical Perspective

- All drugs currently illicit in the U.S. have started out as legal (uncontrolled) substances
 - Heroin
 - Cocaine
 - Marijuana
 - MDMA ("ecstasy")
 - LSD
 - Amphetamine
- Many of these "sat on the shelf" for years before becoming popular intoxicants
- A mixture of rumor, myth and science have all contributed to changes in the legal status of these substances


Herbal incense

- Street drugs
 - Psychoactive substances
 - Inconsistent ingredients
 - Unregulated manufacture
 - Multiple slang names
 - Often difficult to specify effects
 - Inflated prices
- Herbal incense has many of these characteristics



Herbal Incense in the Popular Press

- Sales of “K2” products increased significantly in Chicago following news of its impending status as a controlled substance
- **Following an August 2008 report on “herbal incense” in Germany, ER visits ↑ significantly**
- How do we inform the public of new drugs without setting of an epidemic of use?




Herbal Incense Pharmacology: The Scientific Literature

At present, almost nothing is known about the pharmacology, toxicology and safety profile of such compounds in humans*, except the opinions of consumers in internet forums.

a/k/a “human guinea pigs”


* Mustata, C; Torrens, M; Pardo, R; Perez, C; Farre, M. (2009). a/k/a “human guinea pigs”



Herbal Incense: Typical Effects

- Cannabis-like intoxication
- Dreaminess
- Euphoria
- Introspective mood
- Hilarity
- Forgetfulness
- Heightened sensory perception


THESE ARE THE EFFECTS MOST COMMONLY REPORTED BY USERS



Calls to Poison Control Centers


Data from the American Association of Poison Control Centers’ “National Poison Data Center”

- 2010: 2,874 calls
- 2011: 6,659
- 2012 (first three months): 1,901 (7,604 if trends continued)




Herbal Incense: Other Possible Effects

- Severe anxiety (may persist after herbal incense use is discontinued)
- Panic attacks
- Dissociation (e.g., derealization)
- Racing thoughts
- Hallucinations
- Rapid pulse (tachycardia)
- Seizures




User Report # 1

- This is the worst experience I’ve ever had
- The most anxiogenic substance I’ve ever used
- Nausea, vomiting, heart pounding like I’m going to have a heart attack
- Not sure whether I just said that, thought it or read it
- 2 hours later: Will never take this again




User Report #2: "Apocalypse"

- 3 individual "hits" from a small pipe
- "organic" taste/no chemical odor or taste
- 5 minutes: Feels like Cannabis
- 10 minutes: Like an intense cannabis high
- More than 3 puffs might be too much




Case Study 1

- 33-year-old man
- Imaging technician
- Stable 8 year marriage
- Previous drug use: marijuana, alcohol, tobacco
- Used herbal incense daily
- After 3 months of use suddenly experienced a panic attack
- Immediately discontinued all AOD use
- Repeated episodes of anxiety still occurring after 18 months of abstinence




Case Study 2


- 16-year-old female
- In treatment for alcohol dependency
- History of bipolar disorder
- Smoked 3 "hits" of herbal incense
- 10 minutes (8:00 P.M.) later experienced psychotic episode
- Following observation at hospital, returned to normal at 12:00 A.M.
- Next day no apparent after effects



Use among 8th, 10th and 12th Graders


- **8th grade:** 4.4%
- **10th grade:** 8.8%
- **12th grade:** 11.4%
- 2nd most popular illicit drug after marijuana





Overview

- Most herbal incense contains a cannabinoid/ cannabinoids closely related to THC/marijuana
- No quality control
- Manufacturing process may be associated with adverse effects
- Subjective effects most commonly resemble those of extremely powerful marijuana



Overview

- Other reported effects range from intense euphoria and pleasant hallucinations to abject terror and near-psychotic reactions
- Almost complete lack of scientific study
- 2012: Reports of seizure activity begin
- Street information is very inconsistent

Synthetic Cathinones

Section Two



Khat



Khat

- Native to the Horn of Africa and the south 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 cultivation in Yemen



Khat C



Women in Somalia Selling Khat/Quat



2006: Bundles of khat seized by the DEA



Khat

- Coca-----Cocaine
- Khat-----Cathinone (Schedule I)
- Cathinone: Structure similar to amphetamines
 - Euphoria
 - Anorexia
 - Stimulation
 - Dilated pupils

Bath Salts

- Contain Schedule I Substances as of October 2011

Audience Polling Question #1

Are you seeing "bath salts" drugs among your clients?



Typical Stimulant Effects



- CNS Stimulation
- Insomnia
- Decrease in appetite
- Euphoria
- Cardiovascular events
- Stroke
- Psychosis



"Bath Salts"

- Energizing Aromatherapy
- Down2Earth White Horse
- Kamikaze
- Ivory Wave

- Purple Wave
- Red Dove
- Blue Silk
- Vanilla Sky
- White Blizzard
- *Fake Cocaine*

"Bath Salts"




Down2Earth White Horse



Aromatherapy


"White Blizzard"





Khat to Cathinone


- Khat
- Cathinone (Schedule I)
- Methcathinone (Schedule I)



Methcathinone (Schedule I)

When were they first synthesized?

- MDMA
- Amphetamine
- LSD
- Barbituric acid



Methcathinone (Schedule I)

- First synthesized in 1928
- **1930s:** Used in the Soviet Union as an anti-depressant
- **1960s:** Began to be used as recreational drug in (former) Soviet Union
- More powerful than cathinone
- Effects similar to amphetamines/cocaine
- **1990s:** Appeared in U.S. as "cat"
- Little current use

Possible Substances in "Bath Salts"

All related to cathinone/methcathinone


- 4 – Methylmethcathinone (Mephedrone, M-Cat, Meow, 4-MMC)
- 3,4 – Methylendioxy methcathinone (Methylone, MDMC)
- 3,4 – Methylendioxy pyrovalerone (MDPV)
- Butylone
- Pentadrone
- Pentylone
- MPPP



Possible Substances in "Bath Salts"

All related to cathinone/methcathinone

- Alpha-pvp
- 6-apb
- Ethylone
- Buphedrone
- 4-MEC
- 3,4-DMMC
- Isopentadrone
- pyrovalerone



Small Differences = Different Drugs

- Methamphetamine
- Methcathinone
- Methylendioxy methamphetamine
- Methylendioxy methcathinone

CN(C)Cc1ccccc1

(+)-Amphetamine

CN(C)Cc1ccc(O)c1

(-)-Methamphetamine


CN(C)Cc1ccc(O)c2cc(O)ccc12

(+)-3,4-Methylendioxy methamphetamine


MPTP: A Cautionary Tale

- Meperidine (Demerol®) is a synthetic opiate
- MPPP is a similar substance
- MPTP can be produced during manufacture of MPPP
- MPTP is converted into MPP⁺
- MPP⁺ destroys dopamine cells in the substantia nigra
- Leads to Parkinson-like symptoms
 - Tremor
 - Rigidity
 - Slow movements
 - Problems with walking and gait
 - (Paralysis)


M-CAT




4-Methylmethcathinone & Caffeine:



4-Methylmethcathinone & Caffeine



MDMA, caffeine & 4-Methylmethcathinone




4-Methylmethcathinone & Methylone




"Plant Food"




"Novelty Collector's Item"


 **Mephedrone**

- 4-methylmethcathinone/4-methylephedrone
- 4-MMC/M-CAT
- Do not confuse with methadone or methylene
- Usually ingested or snorted
- Onset:
 - Oral: 15–45 minutes
 - Insufflation (nasal/snorting): 5-10 minutes
 - i.v. injection (rare): 30 seconds
- Duration:
 - Oral/Nasal: 2-3 hours
 - Intravenous: 30 minutes

 **Mephedrone**


- No formal published studies effects on humans
- No animals studies that could be applied to humans
- Controlled under federal analog act if for human consumption
- Not controlled if “not for human consumption”



 **Mephedrone**

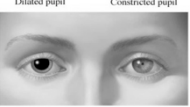
Intended Effects: (Similar to MDMA/ “ecstasy” or cocaine)


- Euphoria
- Enhanced music appreciation
- Decreased hostility
- Improved mental function
- Mild sexual stimulation

 **Mephedrone**

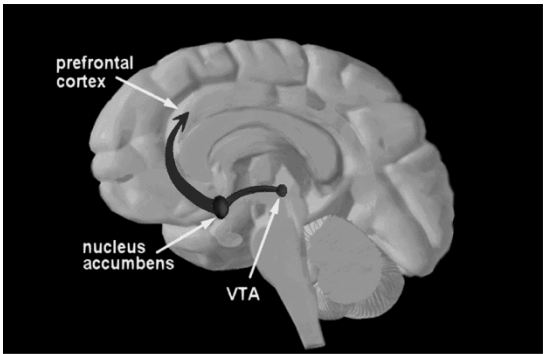
Unintended (Side) Effects:

- Dilated pupils
- Poor concentration
- Bruxism (teeth grinding)
- Problems focusing visually
- Poor short-term memory
- Hallucinations
- Delusions

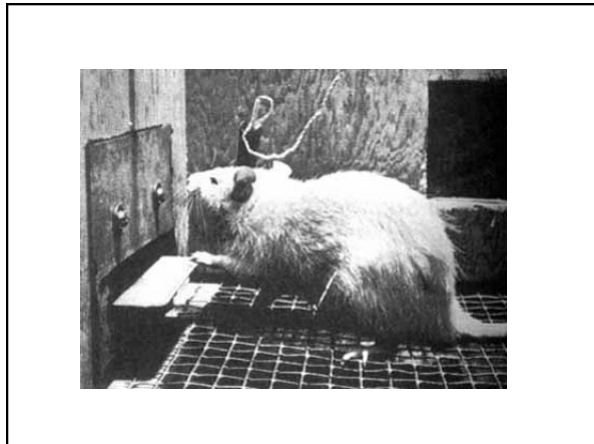


 **Mephedrone Research**

- UK Study:
 - Users w/ previous cocaine experience:
 - Better quality and longer lasting high
 - Less addictive
 - Malanga, et. al. (2012)
- Dr. C.J. Malanga at University of North Carolina
- Effect of mephedrone and cocaine on intracranial self-stimulation (ICSS)



NIDA www.drugabuse.gov



Intracranial Self-Stimulation

- Animal is fitted with an electrode implanted in mesolimbic reward pathway (MRP)
- Animal allowed to stimulate MRP by bar pressing
- Results in brain stimulation reward (BSR)



Cocaine and Intracranial Self-Stimulation

- Allowing an animal already fitted for ICSS to self-administer cocaine decreases its ICSS
- Cocaine augments the pleasurable sensations produced by BSR and reduces the animal's desire to engage in ICSS
- When cocaine is available, ICSS is less desirable



Mephedrone and Intracranial Self-Stimulation

- Animals allowed to self-administer mephedrone decrease their ICSS
- Like cocaine, mephedrone makes ICSS less desirable
- Consistent with user self-reports



MDPV


- euphoria
- increased alertness, awareness and arousal
- increased energy and motivation
- mental stimulation/increased concentration
- increased sociability
- sexual stimulation/aphrodisiac effects
- Mild empathogenic properties
- diminished perception of the requirement for food and sleep




MDPV Addiction Potential

- August 2013 journal *Neuropharmacology*
- Animal self-administration
- Found to be more rewarding than methamphetamine


Methylone




Sold as methylone




Sold as ecstasy



(Sold as M1)
Methylone, bk-MBDB




(Sold as Dragonfly Pokeball)
Methylone, Caffeine




Drugs Sold as "Ecstasy" (2013)

➤ Location/Name	➤ Drug
➤ Purple Lamborghini/Seattle	➤ MDMA
➤ Angry Bird Pink/Las Vegas	➤ TFMPP/caffeine
➤ Moon Rocks/Las Vegas	➤ MDMA/1-(3,4-methylenedioxyphenyl)-2-propanol
➤ Blue Pacman Ghost/Los Angeles	➤ MDMA/caffeine
➤ Pink Gucci/Las Vegas	➤ TFMPP/caffeine
➤ Speckled Pink/NY, NY	➤ None detected
➤ Capsule/San Jose	➤ 2-Methylethcathinone (?)
➤ Molly	➤ No drug detected
➤ White Puma/SF	➤ MDMA/methamphetamine



Drugs Sold as "Ecstasy" (2013)

➤ Location/Name	➤ Drug
➤ Red Heart/Oakland, NJ	➤ Caffeine, TFMPP, Acetaminophen, BZP, Methamphetamine
➤ Cane Sugar/Minneapolis	➤ Methylone
➤ Molly Epindorph/Colorado	➤ Ethylone
➤ Rocky Mountain Molly/Denver	➤ 4-MEC/4-Methylethcathinone
➤ Molly/Phoenix	➤ Cocaine
➤ Molly/NY, NY	➤ Methylone
➤ Molly/Somerset, NJ	➤ Methylone




Piperazines

- Used in medicine to kill parasites
- Some have psychoactive properties and are often substituted for MDMA in "ecstasy"
 - BZP (Benzylpiperazine)
 - TFMPP
- **Others:** mCPP; pFPP; MeOPP; MBZP; MDBZP; 2-C-B-BZP; DBZP

BZP (Benzylpiperiazne)

Section Three




BZP Products



"Charge"


"Extreme Jet"



BZP Effects


Later Effects:

- Mild headache
- Nausea
- Hang-like symptoms (common with high doses)
- Fatigue
- Indigestion/heartburn
- ↑ hunger/thirst
- Insomnia
- Confusion
- Depression (more pronounced with frequent/long-term use)



BZP Side Effects

- Headache
- Dizziness
- Anxiety
- Insomnia
- Vomiting
- Chest pain
- Hallucinations
- Paresthesia
- Tachycardia
- Hypertension
- Palpitations
- Hyperventilation
- Sweating
- Hyperthermia
- Psychosis or adverse psychiatric events
- renal toxicity
- Respiratory failure
- Seizures





25I-NBOMe

- 2C-I-NBOMe
- "N-Bomb," "Smiles," "25I"
- Similar to LSD in potency (600-1,000 mcg) and effects
- May be sold as LSD or "fake mescaline"
- Not active orally
- Taken sublingually, nasally, buccally
- May show up as "blotter"
- Disorientation, confusion, psychosis reported
- Medical reports of fatal seizures/unexplained deaths


Audience Polling Question #2

Have your clients reported using drugs with names such as "smiles", "N-bomb" or 2C-1?


Other Drugs "On the Radar"


- Methoxetamine ("Mexxy")
- 4-MeO-PCP/Methoxydine
- mCPP
- Dimethocaine
- Piperazine Derivatives (e.g., BZP, TFMP, "Plant food")
- Tryptamine substances



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- SBIRT
- ASAM Placement Criteria
- DSM-5 Changes





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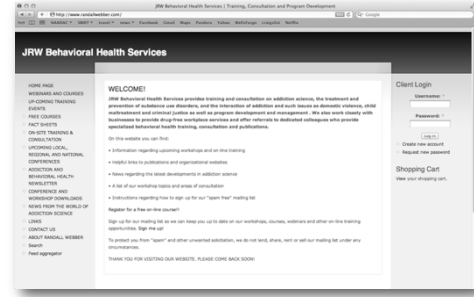
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