# presentations part one

# the real deal on SYNTHETIC DRUGS

a symposium presented by the Criminal Justice Coordinating Council's Substance Abuse Treatment and Mental Health Services Integration Taskforce

### presentations (part one)

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# The Real Deal on Synthetic Drugs: Recent Findings for Washington, DC

July 17, 2014 Presented by: Eric D. Wish, Ph.D. Erin Artigiani, MA Center for Substance Abuse Research University of Maryland College Park <u>www.cesar.umd.edu</u>

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## **CESAR** is...

- Founded in 1990 as an interdisciplinary research center at the University of Maryland, College Park
- Conducts policy-relevant research in all areas related to substance abuse
- Maintains a clearinghouse of substance abuse information
- Publishes the weekly CESAR Fax
- Specializes in applied epidemiology



A Weekly FAX from the Center for Substance Abuse Research University of Maryland, College Park

#### **CESAR FAX** Synthetic Cannabinoid Series

May 9, 2011 to January 13, 2014

(updated April 23, 2014)

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This graph presents four major heroin-use indicators monitored by the D.C.Alcohol and Drug Abuse Services Administration (ADASA): (1) urinalyses of specimens obtained from arrestees detained in the D.C. Superior Court Lock-up; (2) new admissions to an ADASA drug treatment facility; (3) heroin-related admissions to local hospital emergency rooms; and (4) medical examiner reports of heroin-related overdose deaths. The recent increase in heroin use in the District of Columbia showed up first in the arrestee urinaly sis results, a year or more before the other indicators turned up.

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### Percentage of Washington, DC, Adult <sup>7</sup> Arrestees Testing Positive for Cocaine: 1984-June 2014



SOURCE: Adapted by CESAR from data from the Pretrial Services Agency for the District of Columbia.

## Percentage of Washington, DC, Juvenile Arrestees Testing Positive for Marijuana: 1987-June 2014



SOURCE: Adapted by CESAR from data from the Pretrial Services Agency for the District of Columbia.

# National Arrestee Drug Monitoring Programs

- NIJ sponsored the development of the Drug Use Forecasting Program (DUF) in 1986 and the subsequent Arrestee Drug Abuse Monitoring Program (ADAM) in 2000 to track drug trends in 35 sites; Funding was eliminated in 2004
- ADAM II was re-established in 2007 by ONDCP
- ADAM II is county specific and not statewide (N=4,412 male arrestees tested in 2 qtrs per yr)
- In 2011, ADAM II operated in 10 sites; projected to be cut to 5 sites

### **CDEWS Goals**

- Assess the feasibility of the CDEWS methodology in different types of CJS populations and sites
- Assess the value of expanding the drug testing protocol to include synthetic cannabinoids
- Assess emerging drugs at the community level
- Generate hypotheses and questions for future research

### **CDEWS Methodology**

CDEWS rapidly collects small random samples of CJS specimens that tested positive and negative and are ready to be discarded, without regard to age, gender, or charge

### Location of Participating Study Sites



1 population in Prince George's County, Maryland

# Specimens Selected and Tested, by Site and Population

Site and Population	CJS Test Result			Subset Tested
Sile and Population	Positive	Negative	Total	for SC
Washington, DC – Pretrial Services Agency for the District of Columbia				
Parole & Probation	197	103	300	156
Pretrial Surveillance	200	100	300	164
Lockup	200	100	300	162
Virginia – Chesterfield Community Corrections Services				
Probation	37	67	104	58
Maryland - Prince George's County Drug Court				
Drug Court	16	44	60	51
Total	650	414	1064	591

### The FRIENDS Laboratory Expanded Drug Screening Panel

Drugs Tested, by Method	Detection Limit	
Enzyme Immunoassay (EIA)		
Amphetamines	500 ng/mL	
Barbiturates	200 ng/mL	
Benzodiazepines	300 ng/mL	
Buprenorphine	5 ng/mL	
Cocaine	150 ng/mL	
MDMA	500 ng/mL	
Methadone	300 ng/mL	
Methadone Metabolite	300 ng/mL	
Opiates	300 ng/mL	
Oxycodone	100 ng/mL	
PCP	25 ng/mL	
THC	50 ng/mL	
Thin-layer Chromatography	(TLC)	
Ami/Nortriptyline	Hydroxyzine	
Amphetamines	Methadone	
Ativan/Dalmane	Morphine	
Benzodiazepines	Oxycodone	
Clonazepam	Opiates	
Cocaine	Phenmetrazine	
Codeine	Phenothiazines	
Demerol	Quinine	
Dilaudid	Tramadol	
Doxepin	Valium	
Hydrocodone		
Confirmations		
Liquid Chromatography/Mass Spectrometry		
LC/MS was conducted on all EIA positives for opiates, amphetamines and buprenorphine. LC/MS confirmation for opiates was also conducted on all EIA oxycodone positives with a negative EIA opiate screen.		
Gas Chromatography/Mass Spectrometry		
GC/MS was conducted on all EIA positives for PCP.		

# SC Testing Panel for CDEWS 2

Synthetic Cannabinoid Metabolites		
Tested for in CDEWS 1	To be added in CDEWS 2	
AM-2201	АКВ-48	
JWH-018	BB-22	
JWH-019	PB-22	
JWH-073	5F-AKB-48	
JWH-081	5F-PB-22	
JWH-122	AB-PINACA	
JWH-210	5F-AB-PINACA	
JWH-250	ADB-PINACA	
MAM-2201	ADBICA	
RCS-4		
UR-144		
XLR-11		

### Metabolites Found in All Synthetic Cannabinoid Positive Specimens from Five CJS Populations in Three Sites, 2013



### Percentage of Specimens from Young Males<sup>17</sup> Testing Positive for Synthetic Cannabinoids, by CJS Population and CJS Screen Result, 2013



(N=272 Specimens from Males  $\leq$  Age 30)

■ CJS Screen Positive □ CJS Screen Negative

### Percentage of Specimens from Three DC CJS Male Populations Combined Testing Positive for Synthetic Cannabinoids, by PSA Drug Screen Result and Age, 2013

(N=341 specimens from Washington, DC Parole & Probation, Pretrial Surveillance and Lockup)



### Mean Age of Persons Positive for Specific Drugs

(N=900 specimens collected from DC Lockup, Pretrial Surveillance, and Parole & Probation)

Percent Positive by CDEWS Lab for:	Average Age <i>ऱ</i> (SD)
Synthetic Cannabinoids (n=107)	28.5 (8.5)
Marijuana (200)	31.0 (11.0)
PCP (158)	34.5 (10.4)
Oxymorphone (32)	39.9 (13.6)
Hydrocodone (11)	40.0 (13.1)
Hydromorphone (18)	40.2 (15.0)
Oxycodone (30)	41.3 (13.5)
Buprenorphine (72)	43.2 (13.5)
Benzodiazepines (23)	43.3 (11.5)
Opiates (152)	43.4 (12.7)
Morphine (141)	44.1 (12.5)
Codeine (127)	44.4 (12.3)
Cocaine (170)	46.4 (10.2)
Methadone (46)	50.2 (7.9)

### Other Drugs Found in Specimens Testing Positive by CDEWS Laboratory for Marijuana, Synthetic Cannabinoids (SC) or Both

(N=210 specimens from Washington, DC Parole & Probation, Pretrial Surveillance and Lockup Populations Tested for Synthetic Cannabinoids)

Percent also Positive by CDEWS Lab for:	SC Only Positive by CDEWS Lab	Marijuana Only Positive by CDEWS Lab	Marijuana and SC Positive by CDEWS Lab
	(N=85)	(N=103)	(N=22)
PCP	22%	23%	27%
Marijuana	0	NA	NA
Cocaine	4	7	14
Codeine	8	7	5
Morphine	8	7	9
Buprenorphine	7	6	0
Oxymorphone	0	6	5
Oxycodone	0	5	5
Hydromorphone	1	1	5
Methadone	2	1	0
Benzodiazepines	0	1	0
Hydrocodone	1	1	5
Dextromethorphan	0	0	5
Tramadol	1	2	0
Synthetic Cannabinoids	NA	0	NA

# NIDA Community Epidemiology <sup>21</sup> Workgroup

- Our June 2014 was just submitted to NIDA
- Covers Synthetics and other drugs
- http://www.drugabuse.gov/ab out-nida/organization/ workgroups-interest-groupsconsortia/communityepidemiology-work-groupcewg/meeting-reports/areareports-june-2014
- CESAR will continue working with CEWG reps through NDEWS

#### Patterns and Trends of Drug Abuse in the Baltimore/Maryland/Washington, DC, Metropolitan Area—Epidemiology and Trends: 2002–2013

Eleanor Erin Artigiani, M.A., and Eric D. Wish, Ph.D.1

#### ABSTRACT

Throughout the Washington, DC, and Maryland region, cocaine, marijuana, heroin, and other opioids continued to be the primary illicit drug problems in 2013. However, current trends in the indicators monitored for these drugs are mixed. The two key findings in the Baltimore/Maryland/ Washington, DC, area involved heroin and <u>camabinimitics</u>. First, the number of primary treatment enrollments and the number of heroin-related intoxication deaths in Maryland increased in 2012 and 2103. Second, seizures and poison center calls involving <u>camabinimitics</u> increased across the region in 2012 and treatment enrollments mentioning <u>camabinimitics</u> anceased in Maryland in 2013.

In Washington, DC, in 2013, cocaine/crack, marijuana, and heroin continued to be the primary illicit drug problems. Cocaine remained one of the most serious drugs of abuse, as evidenced by the fact that more adult arrestees tested positive for cocaine than for any other drug, and more NFLIS reports were positive for cocaine than for any drug other than marijuana. However, the percentage of adult arrestees testing positive for cocaine (14%) continued to decrease in 2013 and is now lower than at any time since testing began. In comparison, the percentage testing positive for opiates (7%) and PCP (phencyclidine, 10%) remained about the same. The percentage of reports among drug items seized and analyzed by the National Forensic Laboratory Information System (NFLIS) testing positive for cocaine increased slightly to 17% in 2013 after decreasing steadily from 2009-2012. The percentage of items positive for marijuana also increased to 34%. Cannabimimetics and substituted cathingnes first began to appear in 2010, and the number of items involving these substances increased sharply from 1 in 2010 to 33 in 2012 for cannabimimetics and from 13 to 114 for substituted cathingnes. However, this trend reversed in 2013 as items positive for both cannabimimetics and cathinones decreased to 6 and 58 respectively. During 2013, juvenile arrestees were more likely to test positive for marijuana (40%) than for any other drug, but the percentage testing positive for marijuana in 2013 was the lowest since 1993. DC PSA began testing some adult and juvenile arrestee specimens (for suspected use) for cannabimimetics in November 2013. From January through April 2014, the most frequently found metabolite was UR-144.

In Maryland, primary enrollments to certified publicly funded treatment programs most frequently involved alcohol, heroin, marijuana, crack/other cocaine, and other opiates. Enrollments decreased 8 percent in 2013 statewide and 4.5 percent in Baltimore City. However, the percentage of primary treatment enrollments involving heroin increased statewide but not in Baltimore. In Baltimore City, approximately half of enrollments involved a primary heroin mention in 2013. Baltimore still accounted for nearly one-half of statewide heroin enrollments (47%), and nearly 1 in 3 of all enrollments. Drug intoxication deaths increased in Maryland from 2010 to 2012. Heroin-related intoxication deaths remained about the same and prescription opioids-related deaths related intoxication deaths remained about the same and prescription opioids-related deaths decreased 12 percent. In Baltimore, heroin-related intoxication deaths increased 68 percent from

# What are Synthetic Cannabinoids?

- A blend of herbs and plant material sprayed with one or more synthesized chemical compounds or metabolites that are believed to bind to the same receptors as THC
- Sold in small pouches or packets of 0.5-10 grams each as herbal incense or potpourri and often marked as "not for human consumption"
- Typically smoked in joints or pipes or ingested in tea
- Can be more potent than marijuana
- Not detected by standard drug tests
- At least 41 states and Puerto Rico have passed legislation making synthetic cannabinoids illegal

### How many SCs are there?

- DEA National Forensic Information System (NFLIS) reports show that in 2013:
  - 51 SCs identified across the nation
  - 9 found in Maryland in 2013
  - 6 found in DC in 2013
- Reports vary from more than 100 to more than 200 around the world

### What are the effects of SCs?

- Can be similar to marijuana
- Elevated mood, giddiness, dry mouth, decreased motor coordination, increased/irregular heart rate and blood pressure, sweating, extreme anxiety, agitation, disorientation, paranoia, hallucinations, vomiting, tremors, lack of pain response
- In extreme instances: acute kidney injury, seizures, psychosis

# **The Experts**

- "These things are dangerous—anybody who uses them is playing Russian roulette. They have profound psychological effects. We never intended them for human consumption." Dr. John W. Huffman in David Zucchino, "Scientist's Research Produces a Dangerous High," Los Angeles Times, September 28, 2011
- "Don't wait for the results of this investigation. If you have synthetic marijuana, stop using it and destroy it,' said Dr. Ghosh." Lawsuit filed over teen's death from synthetic marijuana,9News.com,11:27 AM, Sep 23, 2013

# The Users: Reports from Erowid 2010-2013

- "The moral of the story is just smoke weed and don't smoke crap synthetics. B/C you can smoke as much weed as you want (of weed) and at the end of the day all you have to do is avoid the cops rather than your subconscious." JWH-250 User
- "...what I've noticed is that 073 is definitely more of an 'outward-focused on the world' high. With 018, I'm more concentrated on my body and what my body is doing (senses etc.); with 073, I find myself looking and thinking about all the things around me. ..073 could definitely be a literary high, though I don't know how good the writing will be." JWH-018 & 073 User
- "I woke up extremely traumatized from the previous night. This was by far the most terrifying experience I have ever had in my life. I have absolutely no plans to try any JWH in the future and I strongly suggest you do your own research before diving in to it yourself." JWH-250 & 019 User

Source: Center for Substance Abuse Research (CESAR), December 2013.

## Who uses SCs?

- 1 in 9 US high school seniors report using synthetic marijuana in the past year (MTF Survey results reported in CESAR Fax 22:28)
- Nearly 1 in 10 College Students have ever used synthetic marijuana; Nearly all also report using marijuana, cigarettes, and Hookah (Hu, Primack et al. 2011 reported in CESAR Fax 20:45)
- Full-time college students less likely to use synthetic cannabinoids or cathinones than other young adults (MTF Survey results reported in CESAR Fax 22:33)
- Study finds that 14% of Undergraduate students at a Southeastern university report synthetic cannabinoid use; Users more likely to be male and identify as LGBT (Stogner and Miller 2013 reported in CESAR Fax 22:20)

# Why do people use SCs?

- Curiosity
- Legality
- Availability
- Effects
- Non-detection in drug testing
- Reduce their cannabis use

SOURCE: Barratt, Cakis, & Lenton (March 2013). Patterns of synthetic cannabinoid use in Australia. Drug and Alcohol Review, 32, 141-146.

# What do we know about the use of SCs in the US?

Leading Indicators monitored through CEWG:

- DEA National Forensic Laboratory Information System (NFLIS)
- High Intensity Drug Trafficking Area (HIDTA)
- Poison Centers Exposure Calls in Maryland

### Number of NFLIS Items Positive for Synthetic Cannabinoids<sup>30</sup> Maryland More than Doubled from 2011 to 2013



Includes primary, secondary, and tertiary reports;

DC 2009 Total Items=7,618; DC 2010 Total Items=7,677; DC 2011 Total Items=6,472; DC Total Items 2012=4,383, DC 2013 Items=2,619 MD Total Items 2009=58,981 MD Total Items 2010=71,579 MD Total Items 2011=77,082 MD 2012 Items=76,483; MD 2013 Items=62,430 SOURCE: DEA, NFLIS special runs 5/12, 12/12, 5/13, 5/14

# HIDTA Cannabimimetics Seizures<sup>31</sup> 2011 - 2013

### Nationwide

- Seizures of cannabimimetics increased more than 20 fold from 1,199.36 KG to 26,941 KG
- Number of seizures more than quadrupled from 87 in 2011 to 488 in 2012 and continued to increase in 2013 to 1016
- The majority of seizures in 2013 were by initiatives in the Northwest HIDTA (112), Midwest (81), North Florida (80), and Washington/ Baltimore (73)

### Washington/Baltimore

- Seizures of cannabimimetics nearly quadrupled from 2011 to 2012 from 164.899 KG to 634.1638 KG and increased again in 2013 to 943.85 KG
- Number of seizures increased from 6 to 45 to 73
- The majority of seizures in 2012 and 2013 were in the Baltimore Metro region which accounted for nearly 75% of the cannabimimetics seized in 2013

Source: Adapted by CESAR from data from HIDTA PMP

MD includes = Baltimore City, Baltimore County, Howard, AA, PG, Montgomery, Charles; VA includes approx. 12 jurisdictions in NoVa and Richmond areas.

## Kilograms of Synthetic Cannabinoids Seized by W/B HIDTA, by Year 2010-2013



NOTES: \* In addition to data shown, 10,775 dosage uniits (D.U.s) were seized in Prince George's County and Washington, DC in 2012 and 11 Dus were seized in Balt Metro in 2013.

Source: Prepared by CESAR from data provided by W/B HIDTA, September 2013 and April 2014.

### National Poison Center Synthetic Marijuana Exposure Calls, by Year and Jurisdiction, 2010-2013



NOTE: Information provided by the National Poison Center Indicates that the Maryland cases are mostly Montgomery and PG, but not entirely. Likewise, the DC cases undoubtedly include some Maryland residents who were treated in DC hospitals. Source: Adapted by CESAR from data from the National Poison Center Toxicall ® – Toxic Exposure Surveillance System, September 2013 and May 2014

### National Poison Center Synthetic Marijuana Exposure Calls, by Jurisdiction and Age 2010 – August 2013

	Mon/Prince George's N=91	Washington, DC N=116
Age*: 12 & under	2.20%	2.59%
13-19	29.67	51.72
20-29	45.05	26.72
30-39	9.89	11.21
40+	9.89	4.31
Gender: Male	74.73	68.97
Effect: Minor	30.77	27.59
Moderate	45.05	44.83
Major	2.2	5.17
No Follow-up	15.39	12.93
No Effect/ Unrelated E	6.6	9.48

Notes: \*Mon/PG had 3 calls with an unknown age; DC had 4 calls with an unknown age. SOURCE: Adapted by CESAR from data from the National Poison Center Toxicall <sup>®</sup>– Toxic Exposure Surveillance System, September 2013

# Summary

- Synthetic marijuana has been found to have harmful effects on users
- Users do not really know what they are using
- Standard testing protocols should be expanded to regularly include synthetic marijuana metabolites
- Recent indicators are mixed



"Tough Work, Vital Mission"

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GRAM

VanillaSt

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# <u>Synthetic Drugs:</u> <u>Bath Salts</u>

Jarce

and SPICE
# "Bath Salts" a/k/a "Research Chemicals" a/k/a "Plant Food"

### $\succ$ It is A White or Off-White Powder.



"Bath Salts" a/k/a "Research Chemicals" a/k/a "Plant Food"

➢ It is Typically Snorted, Smoked or Injected.

It is a central nervous system stimulant that has stimulant and psychoactive properties similar to Schedule I and II type drugs (such as Cocaine, Methamphetamine and Ecstasy (MDMA).

# Bath Salts "<u>Good Trips</u>" Bring – A Euphoric Feeling

### "Bad Trips" Bring

Seizures
 Hallucinations
 Chest Pain
 Nosebleeds
 Vomiting
 Dizziness
 Insomnia

Extreme Paranoia
Agitation
Irritability
Depression
Delusions
Panic Attacks
Suicidal Thoughts

In 2010, Poison Centers Across the U.S. Received 303 Calls Concerning Bath Salts.

- In 2011, Poison Centers Fielded over 5,800 Bath Salts Calls – over 19 Times the Amount of Calls Received in All of 2010.
- In 2012, Poison Centers Fielded over 2,600 Bath Salts Calls
- The Numbers of Bath Salts Calls Fielded by Poison Centers Steadily Declined to about 1000 calls in 2013.

▶ It is Typically Sold in 250 to 500mg Packages.

The Packages are Sold for Approximately \$25 to \$50/Package.

Some of the Names it is Sold Under Include: "Blizzard", "Blue Sky", "Ivory Snow", "Ivory Wave", Ocean Burst", "Pure Ivory", "Purple Wave", "Snow Leopard", "Vanilla Sky", "White Knight", "White Lightening", "White Girl", "Tranquility", "Eight Ballz", "Zoom", "NRG", "1-Shine".







Before Being Made a Schedule I Drug by DEA, the Synthetic Cathinones Mostly Often Found in Bath Salts Were:

Methylenedioxyprovalerone (MDPV)

➢ Methylone

➢ Mephedrone

Now we are dealing various different kinds of cathinone compounds:

► 3,4 DMMC ►3-MEC ► 4-FLUOROISOCATHINONE ►4-MEC ≻4-MePPP ► 4-METHYLBUPHEDRONE ≽alpha-PBP ≻alpha-PVP >BUPHEDRONE >BUTYLONE >DIMETHYLONE ➢ETHYLCATHINONE **≻**ETHYLONE >FLUOROMETHCATHINONE **≻**MABP ► MDPBP ► MDPPP **MDPV** >MEPHEDRONE ►METHEDRONE ►METHYLONE ► MOPPP >MPHP ► NAPYRONE >N-ETHYLBUPHEDRONE ►PENTEDRONE **▶**PENTYLONE

## HERBAL INCENSE - Synthetic Marijuafia A/K/A – "SPICE" OR "K2"



# Spice

It is A Mixture of Herbs and Spices (Resembling Potpourri) That Are Sprayed with a Chemical That is Similar to THC (The Psychoactive Ingredient in Marijuana).





### ≻It Is Typically Smoked.

 $\succ$  It Is Used in Order to Get a Euphoric Feeling.

The Adverse Effects Include: Anxiety, Panic Attacks, Paranoia, Agitation, Hallucinations, Seizures, Elevated Blood Pressure.

# Spice

- In November 2008, the Customs and Border Protection Agency First Became Aware that Synthetic Marijuana was Infiltrating the U.S. Market.
- The American Association of Poison Control Centers Reported 2609 Calls About Exposure to Synthetic Marijuana in 2010
- In 2011, Poison Control Centers Received 6955 Calls Related to Synthetic Marijuana.
- In 2012, Poison Control Centers Received 5200 Calls Related to Synthetic Marijuana.
- In 2013, Poison Control Centers Received about 2,663 Calls Related to Synthetic Marijuana.

Spice

### Synthetic Marijuana is Typically Sold in 3-5 Gram Packages.

▶ It Costs Approximately \$30 to \$50/Package.

Popular Names for Herbal Incense Include: "Spice", "K2", "Wicked X", "Head Trip", "Zero Gravity".

Spice

JWH-018 (a/k/a "Jdub") – Before Being Made a Schedule I Drug by DEA, the Most Common Chemical Component Found in Synthetic Marijuana.

# Spice

### Some of the Various Compounds Found in Spice:

- PB-22
  UR-144
  WIN 55, 212-2
  AM694
  AM2201
  JWH-018
  - ▶ JWH-019
- ≻ JWH-081
- ≻ JWH-210

- ➢ JWH-250
- ≻ JWH-251
- ➢ JWH-398
  - ≻ JWH-122
  - ≻ JWH-203
  - ≻ AM2232
  - ≻ XLR-11
  - > AB-PINACA
  - > AB-CHMINACA> AB-FUBINACA

## BATH SALTS AND SPICE

Both drugs can be purchased at places like "head shops", convenience stores, tobacco stores and gas stations and the Internet.

They were brought into the U.S. from Asia, specifically China and India.

## CHALLENGES FOR LAW ENFORCEMENT

Traffickers of Bath Salts and Spice continuously alter the chemical composition of these drugs so that they do not have the same chemical make-up as those listed in the CSA by DEA as Schedule I drugs. This makes it more difficult to prosecute for distribution, but not impossible!!!

We have to use the Federal Analogue Act (21 U.S.C. §813)

CHALLENGES FOR LAW ENFORCEMEN<sup>54</sup> Three Criteria for the Analogue Act to Work:

### We must show that:

1. The substance has a chemical structure <u>substantially similar</u> to a Schedule I or Schedule II controlled substance;

### and We must show one of the two below:

2A. The substance has a **<u>pharmacological effect</u>** substantially similar or greater than a Schedule I or II controlled substance;

or

2B. The substance was <u>represented by</u> the seller to have a pharmacological effect substantially similar to or greater than a Schedule I or II controlled substance.



### CHALLENGES FOR LAW ENFORCEMENT

### AND.....

## It has to be shown that the substance was intended for <u>human consumption</u>

### CHALLENGES FOR LAW ENFORCEMENT



Methylenedioxypyrovalerone

#### 500 mg

Product ref: MDPV NOT FOR HUMAN CONSUMPTION

### CHALLENGES FOR LAW ENFORCEMEN<sup>7</sup>T

The evidence for the first two requirements (1 and 2A) should be handled by expert testimony (i.e. a Chemist, a pharmacologist and/or a toxicologist)

The evidence for 2B and the "human consumption" requirements have to be handled by investigators. This is where you want good CSs and/or UC officers working your case.

### CHALLENGES FOR LAW ENFORCEMENT

There's a long list of substances, which have been reviewed by DEA experts. The experts have concluded that the substances on the list have chemical structures and pharmacological effects which are substantially similar to or greater than Schedule I or II controlled substances.

Substances are being added to the list continuously.

### CASE WORK





### <sup>62</sup> In July 2012, The Synthetic Drug Abuse Prevention Act was signed into law:

• This legislation immediately placed 26 synthetic drugs into Schedule I of the CSA.

 It also doubled the length of time a substance could be temporarily designated as a Schedule I controlled substance. The temporary designation went from 18 months to 36 months.

 It created a new definition for "cannabimimetic agents" – a definition which established criteria by which similar chemical compounds may be controlled by the DEA.

### THANK YOU

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# A Forensic Perspective on Synthetic Drug Trends

Jill M. Head Supervisory Chemist Emerging Trends Program / Reference Materials Program Special Testing and Research Laboratory Drug Enforcement Administration

# **Emerging Trends in Synthetic Drugs**

## ✓ Synthetic cannabinoids

- Processing how they are made
- Trends in the United States and the District

### ✓ Substituted Cathinones

- Bath Salts, Molly, and the newest cathinones
- ✓ Novel Hallucinogens
  - NBOMe
- ✓ New Trends in Abuse



# Synthetic Cannabinoid Processing

#### Synthetic Cannabinoid



Plant Material







# Synthesis of Synthetic Cannabinoid





DEA Special Testing and Research Laboratory

## Dosing the **Plant Material**

- ✓ Cannabinoid is dissolved in a solvent
- ✓ Solvent is then added to the plant material
  - Hot spots
  - No consistency in dosage











# Packaging



#### NOT FOR HUMAN CONSUMPTION.

This product complies with emergency scheduling of JWH 018, JWH 073, JWH 200, CP4, 497, and Cannabicyclohexanol, Lab report available on request.

THIS KILLER INCENSE IS AN EXOTIC BLEND THAT RELEASES A SUPERBLY RICH AROMA WHEN BURNED. ENJOY THE ENCHANTING AROMA OF THIS KILLER INCENSE.

THE INGREDIENTS IN THIS KILLER INCENSE INCLUDE EXTRACTS AND PLANT MATERIAL FROM THE FOLLOWING HERBS: PUKATEA, NZ LIVERWORT, DAMIANA, LEONOTIS, BLUE LOTUS EXTRACT, VERBASCUM THAPSUS, RED CLOVER, VANILLA AND HONEY.



✓ Not for human consumption

- ✓ "Lab Tested"
- ✓ Keep out of reach of children
- ✓ Retailers take no responsibility...
- ✓ For aromatherapy only...
- ✓ DEA Compliant
- Legal in all 50 states



## **Forensic Analysis**



✓ Contained <u>two</u>
 Schedule I substances
 ■ 5F-UR-144
 ■ PB-22





# **Generational Changes**

#### ✓ Generation 1

□ Includes: JWH-018, JWH-019, JWH-073

#### ✓ Generation 2

Includes: AM 2201, RCS-4, JWH-122

✓ Generation 3

□ Includes: AKB48, STS-135

#### ✓ Generation 4

□ Includes: UR-144, 5-Fluoro-UR-144

#### ✓ Generation 5

□ Includes: PB-22, 5-fluoro-PB-22, BB-22

#### ✓ Generation 6

□ Includes: AB-PINACA, AB-FUBINACA, ADB-FUBINACA

#### ✓ Generation 7

□ Includes: THJ-018, FUB-PB-22, THJ-2201



DEA Special Testing and Research Laboratory
## Cannabinoids by Year

2009/2010	2011	2012	2013
JWH-018 JWH-073 JWH-250 CP-47,497	JWH-019 JWH-081 JWH-122 JWH-200 AM 2201 AM 694 <i>RCS-4</i> <i>RCS-8</i>	JWH-203 UR-144 A 796,260 <b>5-fluoro-UR-144</b> 2NE1 STS-135 AKB48 AB-001	MN-24 (NNE1) AB-FUBINACA ADB-FUBINACA <b>AB-PINACA</b> <b>5-fluoro-AB-PINACA</b> <b>PB-22</b> <b>FUB-PB-22</b> <b>THJ-018</b>
What's new in 2014?			What's old is new again
THJ-2201 FUB-UR144 UR-144-Indaz EG-018	5F-AMB 5F-NPB-22 cole		UR-144 JWH-018 AM2201 5F-UR-144 AKB-48



DEA Special Testing and Research Laboratory Emerging Trends Program

# Cannabinoid Trends in DC

#### ✓ Top 3 brands in D.C.\*

- Bizarro
- Scooby Snax
- Aloha
- ✓ Newest substances identified
  - AB-FUBINACA (Generation 6/2013)
  - FUB-PB-22 (Generation 7/2013)
  - 5F-AMB (New)
  - AB-CHMINACA (associated with multiple overdoses)

\*Based on reported STRIDE data as of 7/15/14



# Scooby Snax



Date Seized	Substance Identified
6/18/2013	5F-UR-144
6/18/2013	5F-PB-22
6/20/2013	PB-22 5F-UR-144 5F-PB-22
2/21/2014	5F-UR-144 PB-22
3/27/2014	5F-UR-144 AB-FUBINACA



### **Overview of Bath Salts**

"Bath salts" are a designer drug typically containing substituted cathinones or phenethylamines.

"Bath salts" are often marketed as "legal highs" and are labeled with "Not for Human Consumption" and "Does Not Contain" statements.



### Substituted Cathinones

- ✓ Mephedrone
- ✓ Methylone
- ✓ MDPV
- ✓ Ethcathinones
- Methcathinones
- ✓ Fluoroamphetamines
- ✓ Fluorocathinones
- ✓ MXE
- ✓ MPPP
- ✓ APBs
- ✓ APDBs

- ✓ Butylone
- ✓ Naphyrone
- ✓ Pentedrone
- ✓ Pentylone
- ✓ Buphedrone
- ✓ alpha-PVP
- ✓ alpha-PBP
- ✓ alpha-PVT
- ✓ PV8
- ✓ 5-IAI
- ✓ MDAI

The use of adulterants/diluents such as inositol, benzocaine, lidocaine, caffeine, etc. is common



# "Molly"

- Ecstasy tablets in the 1980s–early 2000s typically contained MDMA
- ✓ In ~2006, ecstasy tablets featured mostly BZP/TFMPP combinations
- ✓ Rise in crystal or powder MDMA
  - Called "Molly"
- Many current "Molly" investigations have been found to be methylone or other substituted cathinones





## Cathinone Trends in DC

### ✓ Most Common "Bath Salts" in D.C.\*

- MDPV
- 5-MeO-DiPT
- Alpha-PVP

#### ✓ Trends in abuse

- Many of the MDPV seizures are tablets
- MDPV often identified with BZP/TFMPP
- MDPV also identified with other cathinones

# Hallucinogens

- ✓ Published in PiHKaL by Alexander Shulgin
  - **2**C
  - NBOMe



 ✓ Found as powder, tablets, liquids, blotter paper, sugar cubes, window panes, etc.





## Hallucinogen Trends in DC

- ✓ Few DEA cases analyzed by laboratory
- ✓ Several 25I-NBOMe seizures identified
  - Common dosages = 250-500 ug
  - Onset = 0-15 minutes
  - Total duration = 4-8 hours



### **Current Trends of Abuse**

### ✓ E-cigarettes

- Minimal odor
- Discreet
- Refillable



**Contained AB-PINACA** 



#### **Emerging Trends Program**

Supervisory Chemist Jill Head Senior Research Chemist Dr. Art Berrier Forensic Chemist Emily Dye Forensic Chemist Dr. Liz Guest Forensic Chemist Sarah Pillard Forensic Chemist Josh Yohannan

### **THANK YOU!**



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