Emerging Drug Trends

CNS Depressants
CNS Stimulants
Hallucinogens
Narcotic Analgesics
Dissociative Anesthetics
Cannabinoids

DRE National Tracking System
(Pharmaceuticals 2010 – 2013):

Depressants: 1) Alprazolam (Xanax), 2) Clonazepam, 3) Carisoprodol, 4) Diazepam, 5) Zolpidem

Stimulants: 1) Adderall, 2) Methylphenidate (Ritalin, Concerta), 3) Phendimetrazine (Bontril)

Narcotic Analgesics: 1) Oxycodone, 2) Hydrocodone, 3) Buprenorphine, 3) Oxymorphone
13 State Survey of DUID Labs

<table>
<thead>
<tr>
<th>Compound</th>
<th>Number of Laboratories Reporting This Compound/Class in Their Top 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>THC and metabolites</td>
<td>13</td>
</tr>
<tr>
<td>Alprazolam/Alpha-hydroxyalprazolam</td>
<td>13</td>
</tr>
<tr>
<td>Cocaine and metabolites</td>
<td>13</td>
</tr>
<tr>
<td>Morphine</td>
<td>13</td>
</tr>
<tr>
<td>Zolpidem</td>
<td>12</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>12</td>
</tr>
<tr>
<td>Carisoprodol/Mebaralazine</td>
<td>11</td>
</tr>
<tr>
<td>Zolpidem</td>
<td>11</td>
</tr>
<tr>
<td>Alprazolam/Phenobarbital</td>
<td>9</td>
</tr>
<tr>
<td>Clonazepam/7-aminoclonazapem</td>
<td>9</td>
</tr>
<tr>
<td>Zolpidem</td>
<td>9</td>
</tr>
<tr>
<td>Salbutamol</td>
<td>7</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>6</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>6</td>
</tr>
<tr>
<td>Tramadol</td>
<td>6</td>
</tr>
</tbody>
</table>

“Designer Drugs”
1st used in 1960’s when analogs of mescaline first appeared.

Used again in the 90’s when referring to underground chemists designing a new molecular compound that replicated the effects of an illegal drug.

Also commonly referred to as “Club drugs” but can include about any new synthetic drug.

Emerging Drug Trends

“Designer Drugs”

Best defined as a synthetic analog of a legally restricted or prohibited drug, devised to circumvent drug laws.

A more accurate term – “legal loophole drugs”
### Emerging Drug Trends

#### CNS Depressants

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Description</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tetrahydropalmatine</strong></td>
<td>Jin Bu Huan – Chinese herb used for centuries as a mild sedative and analgesic. Recently marketed for insomnia. Detected in various smoking mixtures containing synthetic cannabinoids.</td>
<td>Commonly prescribed for children, but can be abused by adults. Liquid drinkable and injection form.</td>
</tr>
<tr>
<td><strong>Versed (Midazolam)</strong></td>
<td>Benzodiazepine - Used to produce sleepiness or drowsiness and to relieve anxiety before surgery or certain other procedures.</td>
<td>Commonly prescribed for children, but can be abused by adults.</td>
</tr>
</tbody>
</table>
Emerging Drug Trends

CNS Stimulants

The Stimulant/Hallucinogen Continuum

Stimulants

- Euphoria
- Energy
- Excitation
- Empathogenicity (Emotional effects)
- Delusions
- Hallucinations
- Dissociation

Hallucinogens

NMS Labs Drug ID Casework (2012)

<table>
<thead>
<tr>
<th>Single Drug Products</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylone</td>
<td>THUNDA CAT ZOOM 2 Plant Food</td>
</tr>
<tr>
<td>MDPV</td>
<td>Vanilla Sky</td>
</tr>
<tr>
<td>α-PVP</td>
<td>Vanilla Sky Omise</td>
</tr>
<tr>
<td>BTCP</td>
<td>Blue Triangular Pills</td>
</tr>
<tr>
<td>Isopentadron/pentedrone</td>
<td>ZZ-1</td>
</tr>
<tr>
<td>MDMA: Methylene Homolog</td>
<td>Unknown powder</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiple Drug Products</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-MEC, JWH-073, JWH-200, JWH-018</td>
<td>ZK-1</td>
</tr>
<tr>
<td>4-MPPP, α-PVP</td>
<td>Unknown powder</td>
</tr>
<tr>
<td>Pentylene, pyrovalerone, benzocaine, caffeine</td>
<td>Unknown powder</td>
</tr>
<tr>
<td>Tetrahydroalpinetine</td>
<td></td>
</tr>
</tbody>
</table>

Chuck Hayes, IACP DEC Program
Mephedrone DUI Research


- 32 DUID cases, including nine with mephedrone as the only drug present.
- Weaving within and out of lane
- Dilated pupils, poor SFST performance, slurred speech.
- Blood concentrations ranged up to 0.74 mg/L (n=9; mean 0.21, median 0.10) although the most common value encountered is likely to lie between 0.2 and 0.3 mg/L.

Stimulants/Hallucinogens

- Alpha-PVP
- Methylone
- MDPV
- DMAA
- 4-MEC
- 25I-NBOMe
- 25C-NBOMe
- 25H-NBOMe
- 25B-NBOMe

Emerging Drug Trends

Hallucinogens
Hallucinogens

The Synthetics –

- 2C compounds (27 known*)
- NBO-Me compounds (33 known*)
- DOX compounds (19 known*). Most common: DOB, DOC, DOI, DOM
- Plant compounds (Derived from Kratom, Kanna)

* DEA Report June 2013

Hallucinogens

2C-I, 25-I-NBOMe and 2C-I-NBOMe

- Taken orally
- Encountered on blotter paper and in dropper bottles
- Effects seem to combine MDMA with LSD
- "N-BOMB" – "Smiles"

Hallucinogens

“Molly”

Powder or crystal form of MDMA

Short for “Molecule” it is considered a pure form of 3, 4-Methylenedioxyamphetamine (MDMA), the drug in Ecstasy

Also known as Mandy, Misty, Legal X, or Legal E

Not normally laced with other ingredients such as caffeine and methamphetamine sometimes found in Ecstasy
**Hallucinogens**

5-MeO-DMT
- 5-Methoxy-N, N-dimethyltryptamine
- Naturally occurring psychedelic present in numerous plants and the venom of the Bufo alvarius toad.
- Not the same as DMT

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**Narcotic Analgesics**

- Tapentadol (Nucynta)
- Acetyl Fentanyl
- AH-7921 (Doxylam)
- Desomorphine (Krocodil)

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**Narcotic Analgesics**

Nucynta (Tapentadol)
- Schedule II C.S.
- High risk for abuse
- 50 mg, yellow round tablet, printed with “O-M” and “50”
- 75 mg, yellow-orange round tablet, printed with “O-M” and “75”
- 100 mg, orange round tablet, printed with “O-M” and “100”
Acetyl Fentanyl – “Fire”

- New injectable synthetic opioid
- A fentanyl analog
- At least 5 times more potent than heroin
- Same color, consistency and packaging as heroin
- Not approved by the FDA and not commercially available
- Involved in numerous deaths in Rhode Island and Pennsylvania (2013)

AH-7921

- First synthetic opioid research chemical.
- 80% potency of morphine.
- White powder.
- Available online (Isomerism)
- Marketed as AH-7921 or “Doxylam”

*AH-7921 is an exciting new chemical and an opioid analgesic, with approximately 80% potency compared with Morphine based on its chemical structure.*

Desomorphine

- Commonly known as “Krokodil”
- Name comes from the green, scaly appearance of the user’s skin
- Originated in Russia as a cheap substitute for heroin
- Synthesized from Codeine (Also includes gasoline, paint thinner, iodine, hydrochloric acid and red phosphorus)
- Allegedly causes massive tissue necrosis at injection sites from impurities and by-products
**Emerging Drug Trends**

**Dissociative Anesthetics**

**Ketamine Derivative**

- Methoxetamine (MXE)
- 2-(3-methoxyphenyl)-2-(ethylamino)cyclohexanone
- Street names: Mexxy or MXE
- Effects range 5 – 7 hours
- Legal form of Ketamine

**Emerging Drug Trends**

**Cannabis / Synthetic Cannabinoids**
A "cannabinoid" is a class of chemical compounds in the marijuana plant that are structurally related.

"Synthetic Cannabinoids" are a large family of chemically unrelated structures functionally (biologically) similar to THC. May have less, equivalent or more pharmacologic (psychoactive) activity than THC. Many unknowns.

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**Synthetic Cannabinoids Timeline**

- **1964** – Isolation of THC from Cannabis
- **1967** – Synthesis of synthetic THC
- **1988** – Pfizer starts developing CP cannabinoids for analgesic effects
- **1988** – Isolation of CB1 Receptor
- **1988** – HU-210 investigated at Hebrew University
- **1995** – John W. Huffman researches relationship between drug structure and brain receptor activity with JWH-018
- **2004** – K2 sold on Internet
- **2008** – U.S. seizes Spice products at border
- **2011** – U.S. temporarily controls five synthetic cannabinoids
- **2012** – DEA adds UR-144, XLR11 and AKB48 as Controlled Substances

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**Synthetic Cannabinoids Evolution**

<table>
<thead>
<tr>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
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<tbody>
<tr>
<td>JWH-018</td>
<td>AM-2201</td>
<td>AM-2204</td>
</tr>
<tr>
<td>JWH-073</td>
<td>AM-604</td>
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<tr>
<td>JWH-250</td>
<td>JWH-019</td>
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<td>JWH-019</td>
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<td>JWH-058</td>
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<td>NMS Labs Synthetic Cannabinoids Testing</td>
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<tr>
<td>New Compounds: PB-22</td>
<td>AKB-48</td>
<td>AB-PINACA</td>
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<td>NMS Labs Synthetic Cannabinoids Testing</td>
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</tbody>
</table>
### Synthetic Cannabinoids (After April 2013)

- **Decline in UR-144, AM-2201, JWH-122**
- **XLR-11 stable**
- **On the rise:** PB-22, FPB-22, F-AKB-48

<table>
<thead>
<tr>
<th>Compound</th>
<th>Positives</th>
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<tbody>
<tr>
<td>FPB-22</td>
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<tr>
<td>PB-22</td>
<td>8</td>
</tr>
<tr>
<td>AKB-48</td>
<td>2</td>
</tr>
<tr>
<td>F-AKB-48</td>
<td>4</td>
</tr>
<tr>
<td>AB-PINACA</td>
<td>2</td>
</tr>
<tr>
<td>STS-135</td>
<td>1</td>
</tr>
</tbody>
</table>

### Synthetic Cannabis DUID Cases


- 12 cases of suspected impaired driving involving synthetic cannabinoids. Other drugs and alcohol ruled out.
- Attitude of the drivers was described as cooperative and relaxed, speech was slow and slurred, and coordination was noted to be poor. Pulse and blood pressure were generally elevated. The most consistent sign noted was a marked lack of convergence in all cases where it was assessed.

### Synthetic Cannabinoids DUID Cases


- DUID cases involving AM-2201, JWH-018, JWH-019, JWH-122, JWH-210, JWH-307, MAM-2201 (JWH-122 5-fluoropentyl derivative), and UR-144.
- Analytical results and signs of impairment documented by police or physicians.
- Findings: Consumption of synthetic cannabinoids can lead to impairment similar to typical performance deficits caused by cannabis use which are not compatible with safe driving.
- Deficits include centrally sedating effects and impairment of fine motor skills necessary for keeping the vehicle on track.
Cannabis/Synthetic Cannabinoids

Other Issues:
5 ng/mL per se for THC

Impairment is Impairment!

Impact of 5 ng/mL THC Per Se Law (WA & CO)

10,144 Marijuana DUID /DRE cases testing positive for THC and/or metab.

81% below 5ng/mL

Questions - Comments

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