Synthetic Drug Threats and Butane Honey Oil THC Extraction
Introductions

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Objectives
(in no particular order)

• Review and describe synthetic drugs currently being sold as “legal” products.

• Describe synthetic stimulants (aka “bath salts”) and synthetic cannabinoids (aka “K2” or “Spice”).

• Review various physical and psychological effects of these chemicals.

• Discuss the latest THC extraction technique known as butane honey oil.

• Discuss the difficulties Federal, State and Local officials have when trying to control them.
Designer Drugs: Background

- Trend started in the 1970’s
- Drugs of abuse are classified by the DEA
- Drugs of abuse work according to structure
- Analogues: think “close chemical cousins”
  - an analogue will have similar activity but an altered “structure” which is not a “controlled substance” due to structure changes
  - thus legal penalties and restrictions do not apply
• Widespread research into these chemicals is still limited. Think tip of iceberg.

• These chemicals are easily/quickly altered into new chemicals which may or may not be “controlled” under current law.

• Those in the front lines of this new drug war include law enforcement, first responders and emergency room personnel.
Morphing one drug into another

By changing a single letter you can see how we can morph the word “drugs” into the word “brain”.

- DRUGS  (change the U to A)
- DRAGS  (change the G to W)
- DRAWS  (change the S to N)
- DRAWN  (change the D to B)
- BRAWN   (change the W to I)
- BRAIN

- Brain and Brawn are significantly similar…but Drugs and Brain are not.
Mephedrone & Methamphetamine

Mephedrone:

\[
\begin{align*}
\text{Methamphetamine:} & \\
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\]

Methylone

MDMA
Designer Drugs: Evolution

• Designer drugs can be “created” to:
  – Eliminate unwanted side effects
  – Potentiate desired effects
  – Target specific neurotransmitters
  – Evade legislative bans
  – Allow user to “pass” drug tests
Designer Drugs

• It’s all about the $$$$$$$$
  – Take an existing chemical,
  – Create an analogue that is NOT covered by current laws/statutes/ordinances,
  – Distribute as everyday household products
    • bath salts, plant food, potpourri, incense, jewellery cleaner, hummingbird attractant, etc.
  – Label “not for human consumption”
  – Market via social media, web and retail outlets
To create an agonist – is a chemical that binds to a receptor and triggers a response – often mimicking the action of a naturally occurring substance.

Source: Paul Cary University of Missouri Toxicology Lab
Why all this matters…

• Marijuana is a PARTIAL agonist…thus it causes a smaller reaction. Picture being sprayed with a garden hose.

• Many synthetic cannabinoids are FULL agonists and thus cause a much bigger reaction. Picture being sprayed with a fire hose.
European Drug Monitoring

- 24 new psychoactive drugs 2009
- 41 in 2010
- 49 in 2011
- 57 in 2012
- Since 2012… **more than one a week!**
- Synthetic cathinones & synthetic cannabinoids make up more than 2/3 of new drugs
The major families and subfamilies of research chemicals, and some of their most prominent members.
Phenethylamines???

• A classification of chemical compounds, most of which are psychoactive drugs. Primarily **stimulants** but some have **hallucinogenic** properties as well.

• They mimic the effect of natural stimulant neurotransmitters found in the brain.

• Think methamphetamine, Concerta/Adderall, amphetamine or cocaine/crack.

• [https://www.erowid.org/library/books_online/pihkal/pihkal.shtml](https://www.erowid.org/library/books_online/pihkal/pihkal.shtml) Link to PiHKAL and list of phenethylamines.
Cathinones???

- Cathinones are powerful stimulant chemicals derived from a shrub-like plant known as **KHAT**.
- The molecule is similar to ephedrine and amphetamine.
- Cathinone is the source of several well known chemicals found in what are referred to as “bath salt” products…
  - Effects seen with Cathinone use are similar to taking methamphetamine and ecstasy at the same time!

Tryptamines?????

• A class of indole alkaloid drugs/chemicals, many of which are psychoactive. Tryptamines are typically serotonin-affecting psychedelics and/or hallucinogens.

• Examples include: LSD, LSA, DMT, AET, AMT, Mescaline and Bufotenin (extracted from toad venom). There are dozens more…and more being added to the list every year.

• https://www.erowid.org/psychoactives/faqs/faqs_trypptamine.shtml#tryp
Piperazine???

- Piperazine is a drug that belongs to the family of medicines used in the treatment of worm infections (roundworms, pinworms).
- In the past few years, illegal drug manufactures have used piperazine in the production of ecstasy tablets as a cheap substitution.
- Piperazine is an ideal choice for making fake ecstasy because of the similarity in taste, and at certain doses, a user may experience favorable side effects and feel “high.” BZP and TFMPP are typically used as adulterants in ecstasy.
Synthetic Cannabinoids???

- Research chemicals created during legitimate medical research searching for medical uses for cannabinoid-like chemicals.

- The human brain/body contains cannabinoid receptors (CB1 and CB2) which respond to these cannabinoids.

- “Spice” and “K2” products are generic product names which began showing up here in the US back in 2008. The chemicals are sprayed on botanical/herb materials and smoked like marijuana in a joint, hooka or bong.

- There are upwards of 500 distinct chemicals.
Alexander Shulgin

• A couple of books to add to your reading list…if you are a drug nerd:
  
  • PiHKAL: Phenethylamines I have known and loved.
  • TiHKAL: Tryptamines I have known and loved.
  • Both books by chemists Alexander and Ann Shulgin.
    – Most drug aficionados consider both books:
      • “A prerequisite to the psychedelic experience.”

Alexander Shulgin: aka the “godfather of ecstasy”. Pictured at right with his wife Ann.
Web Sites

NOTE, the websites below should NOT be viewed by children.

• www.k2info.org
• www.bluelight.ru
• www.erowid.org
• www.lycaeaum.org
K2 Products

- Thousands of package variations.
- Concentration of chemicals vary.
- Packages often contain multiples.
“When you see a designer synthetic drug industry as lucrative as this in the U.S., it would only be natural that it would be a huge target for those trying to finance their terrorists.”

A single convenience store in Alabama was linked in the transfer of $21 million to Yemen in 2013.
Description of the Drug

- Mixture of herbal and spice plant products
  - Leaf can be: marshmallow leaf, parsley, etc.
- Sprayed with synthetic cannabinoids
- Marketed as incense and “not for human consumption”
- No regulations to list ingredients or age requirements to purchase
- First generation Missouri had 6 chemicals.
- Second generation Missouri saw 10-12 chemicals.
- Third generation Missouri saw over 20 chemicals.
Synthetic Marijuana (JWH- 018)

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

K2 is largely created by individual sellers, it's anyone's guess what else is added to the mix. **NOTE: We have found as many as five distinct chemicals in a single bag.**
Synthetic Cannabinoids Pharmacology

- Research supported by NIDA-John W. Huffman
- Two cannabinoid receptors in human brain CB1 and CB2
- CB2 affects inflammatory pain (target of NIDA study)
- JWH analogs target both receptors
- Huffman: “JWH is easiest to make outside of a lab only need two commercial products”
- Transferring to plant material only requires using acetone and a device to spray the material.
Any Dangers Involved in Spice/K2 Use?

- **Yes.** During the research studies, animals were used...these chemicals have **not tested for use in humans.**

- JWH-018 inventor John W. Huffman, PhD, puts it bluntly: "**It is like Russian roulette to use these drugs. We don't know a darn thing about them for real.**"

- These synthetic cannabinoids have been associated with impaired driving incidents, attempted suicides, thousands of emergency department visits, and have been linked to such adverse effects as increased anxiety, panic attacks, heart palpitations, respiratory complications, aggression, mood swings, altered perception, strokes, heart attacks and paranoia.
Dangers Involved in K2

• (Jan 2013) multiple reports of kidney failure
• Reports of cardiac events such as heart attack in young male users
• Medical reports indicate that K2/Spice drugs potentially result in users developing a rapid and powerful addiction on a level not usually found among smokers of “real” marijuana.*

* Remember! FULL AGONIST!
Teens & K2 Effects in ER

• One 16-year-old girl was catatonic, unable to speak or respond to any touch, when she arrived in the emergency room. A urine drug test showed she had cannabinoids in her system.

• Another teen, a 16-year-old boy, had problems with movement and trouble with his speech. Although he was alert, he seemed confused, and could only answer simple questions.

• And an 18-year-old boy was brought to the emergency room agitated and excessively sweating. He was restless, aggressive and uncooperative.

Thousands of reports…
POISON CONTROL Day by day exposures: Synthetic cannabinoids

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PLEASE NOTE:

- These data are only representative of calls received by the poison centers and may not reflect the actual severity of the problem in the U.S. or any specific geographic location.
- As there is no mandatory reporting, there may be emergency room presentations and hospital admissions of which poison centers are unaware.
- Subject to the above bullets, these numbers are largely reflective of those users/abusers who have experienced adverse effects from the use of these products significant enough to warrant poison center or other health professional intervention; not all individuals who use/abuse such products call poison centers or visit emergency rooms.
- Nevertheless, the data are a good surrogate marker for rising use/abuse patterns and patterns of adverse medical outcomes associated with their use.
- For more information about the American Association of Poison Control Centers (AAPCC) data, please visit: http://www.aapcc.org/data-system/
On Line Reported K2 Effects

• Strong dysphoria (uneasy, uncomfortable) and panic attacks are common.

• Self mutilation
  - Heavy body load
  - Extreme nausea
  - Fear, Panic, Anxiety
  - Strong aural hallucinations
  - Racing heart (higher doses)
    – Heart attack
    – Stroke
On Line Reported K2 Effects

• Marijuana-like effects
  – Euphoria
  – Giddiness
  – Silliness
  – Impaired short-term memory and concentration
  – Increased appetite
Scooby Snacks: K2
SYN Incense
Combinations of JWH 018, 250, 081, 019 & 200 and RCS 8

Christmas KUSH
No chemicals found

Freedom
JWH 250 & 081

Cloud Ten Storm
JWH 250 and 081

Groove
JWH 250 & 081

Ed Hardy (Skull) contained JWH 250, 018 and 081.
All samples of K3 “Legal” contained JWH 250.
Newton County youth Summer 2012 K2 exposure
Spice Withdrawal

- Unrest & Agitation
- Anxiety & Panic Attacks
- Tremors
- Heart Palpitations
- Nausea Vomiting
- Sweating
- Nightmares
- Cravings
- Depression
K2 Treatment Issues

- High rates of addiction (K2info.org)
- Withdrawal due to physical addiction
  - Treated with sedatives and clonidine
- Residual effects for weeks (or months) due to long half-life & fat storage
- Unpredictable
K2 Overview

- No quality control
- Manufacturing process may be associated with adverse effects
- Subjective effects most closely resemble those of very powerful marijuana
- Almost complete lack of scientific study
- Street information very inconsistent
Mitragyna Speciosa

• Used in:
  – Malaysia
  – Thailand
  – Indonesia

• Local names:
  – Ithang
  – Biak Biak
  – Ketum
  – Kakuam
Kratom Pharmacology

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

• More like an opioid than a hallucinogen.

• https://www.erowid.org/plants/kratom/kratom_basics.shtml
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

- Seems to be a stimulant in lower doses
  - Mitragynine
- Seems to be sedative in higher doses
  - 7 hydroxymitragynine
- Often produces a mixed effect
- Onset 5 to 10 minutes
- Duration several hours
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 - Standardized 10:1  4g

Traditional/Medicinal Uses:
Mitragyna speciosa (Kratom) seems to ease the mind, energize the body and allows a sort of meditative repose under the most grueling physical conditions. The authenticity of our leaves has been verified by 2 independent sources. This is THE new standard for Kratom products! This Kratom product is a standardized powdered extract for consistent mitragynine content in every batch. It's a super fine powder; cold extracted, and mixes well with any liquid. Active at 1G, strong effects at 2G.

This product is an exotic incense, NOT FOR HUMAN CONSUMPTION.
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.”

• [http://adventureindustries.com/index.cfm](http://adventureindustries.com/index.cfm)
E-cigarettes/pipes

• Feb 2015  John Hopkins study released claims “e-cigs” are NOT a healthy alternative to smoking cigarettes.
  – Respiratory infections, lung damage and weakening of immune system
• Practically ANYTHING can be “vaped”.
• Vaping often removes “tell-tale” odors and the user can vape with relative safety regarding law enforcement or on the job.
Synthetic stimulants

- Psychoactive-stimulants sold under the names:
  - “Bath Salts”
  - “Jewelry cleaner”
  - “Cell phone screen cleaner”
  - “Plant food”
  - “Natural insect repellant”

- Convenience stores, truck stops, tattoo parlors, herbal shops, smoke shops and the Internet.
Officer Safety/Public Safety
• A “dose” is normally 0.1 gram.
Bath Salts & More

28.3% Positivity Rate—Alpha PVP and Ethylone are the Culprits

In 2013, NMS Labs confirmed only 2 blood Ethylone positives. In 2014, it was our second largest finding.

Source: Of the 459 blood samples submitted to NMS Labs in 2014, 28.3% samples were positive for 1 or more analytes in the Expanded Bath Salts & Stimulants Panel (8756B). Confirmed positive cases (n=130) included methamphetamine and amphetamine; of the 198 positive analytes, methamphetamine and amphetamine were 30.8% of the positives.

Source: www.designerdrugtrends.org
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)
• Think chewing coca leaves in the Andes.
Khat

- Coca -----------------coca
- Khat -----------------cathinone (Schedule I)
- Cathinones: Structure similar to amphetamines
  - Euphoria
  - Anorexia
  - Stimulation
  - Dilated pupils
  - Hypnagogic hallucinations (between conditions of sleep and awake).
Mephedrone Background

- Discovered 1929
- Rediscovered 2003 web site “The Hive”
  - The Hive is now shut down but Erowid hosts much of its information.
- Was a replacement for Ecstasy
- Sold as “plant food” & later “bath salts”
- Manufactured in clandestine labs
- Methylene-dioxy-pyrovalerone (MDPV)
MDPV Timeline

• MDPV was developed in the 1960s, and has been used for the treatment of chronic fatigue, but caused problems of abuse and dependence.

• 2005: MDPV appears as a recreational drug; first mention on Drugs-Forum.

• 2007: First seizure of MDPV as a recreational drug, by customs officials in the German state of Saxony. The drug had been shipped from China.

• 2008: First seizure of MDPV in the United States.
MDPV Timeline

• 2009-2010: MDPV made illegal in much of Europe.

• 2010: The US considers both Mephedrone (July, 2010) and MDPV (December, 2010) "a drug and chemical of concern".

• 2011 & 2012: MDPV sale and possession are banned in most US states with MDPV being BANNED HERE IN MISSOURI.
FLAKKA???

- Use of a dangerous synthetic cathinone drug called alpha-pyrrolidinopentiophenone (alpha-PDP), popularly known as "Flakka," is surging in the US.

- Stimulation, paranoia, excited delirium, strokes, suicides, assaults and hallucinations are commonly seen.

http://www.drugabuse.gov/drugs-abuse/emerging-trends
Bath Salts (Cathinones)
Appearance

- Distinctive odor
  - Fishy
  - Vanilla
  - Stale urine
  - Bleach
Cathinones Use

• Capsules, tablets or white granuels
• Can be swallowed, smoked, snorted, injected
• Prominent use in Europe
• Out of 70 Dutch users of mephedrone, 58 described it as an overall pleasant experience and 12 described it as an unpleasant experience. The effects are DOSE dependant.
Cathinones Effects

- Duration
  - Total 2 – 5 hours
  - Onset 15-45 minutes
  - Coming up 15 – 30 minutes
  - Plateau 15 – 30 minutes
  - Coming down 30 – 90 minutes
  - After effects 2 – 4 hours
Cathinones Desired Effects

- Mental and physical stimulation
- Euphoria, mood lift
- Feelings of empathy, openness
- Increase in sociability, desire to talk with others
- Pleasurable rushing
- Sense of being sped up
Cathinones General Effects

• General change in consciousness (as with most psycho-actives),
• Decreased appetite
• Pupil dilation
• Unusual body sensations (facial flushing, chills, goose bumps, body energy)
• Increase in heart rate and blood pressure
Cathinones General Effects

• Sleep deprivation, hyper alertness, insomnia
• Bruxism and compulsive movements
• 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
Cathinones Toxic Effects

- Severe paranoia
- Psychosis (Excited Delirium)
- Hypersexuality
- Aggression
- Hallucinations
- Anxiety and depression
- Seizures
Synthetic Cathinones Effects Summary Sheet

- Aggression
- Agitation
- Breathing difficulty
- Bruxism (grinding teeth)
- Confusion
- Dizziness
- Extreme anxiety sometimes progressing to violent behavior
- Fits and delusions
- Hallucinations
- Headache

- Hypertension (high blood pressure)
- Increased alertness/awareness
- Increased body temperature, chills, sweating
- Insomnia
- Kidney pain
- Lack of appetite
- Liver failure
- Loss of bowel control
- Muscle spasms
- Muscle tenseness
- Vasoconstriction (narrowing of the blood vessels)

- Nausea, stomach cramps, and digestive problems
- Nosebleeds
- Psychotic delusions
- Pupil dilation
- Renal failure
- Rhabdomyolysis (release of muscle fiber contents [myoglobin] that could lead to kidney problems)
- Severe paranoia
- Suicidal thoughts
- Tachycardia (rapid heartbeat)
- Tinnitus
2C-1 or “Smiles”

- Reports now in Midwest
- 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
Molly’s

- Popularly thought to be “pure” MDMA.
- BUT typically **NOT MDMA**. Almost always has adulterants present, like bath salt type chemicals.
- Used at parties and raves
- Familiar effects of ecstasy BUT a much more powerful stimulant effect.
Salvia divinorum

- Regulated in Missouri
- Schedule 1
- Not regulated by Feds
- Dissociative effects
  - Visions and hallucinations
- Purchased on internet or locally
- Most potent hallucinogen mg for mg
- Typically smoked
- Trip lasts up to 30 minutes.
Effects of *Salvia divinorum*

**Psychological**
- Increased self-confidence
- Feeling like someone or something else
- Increased or decreased concentration
- Surroundings seeming unreal
- Increased insight
- Calmness
- Spiritual experiences
- Weird thoughts
- Floating feeling
- Racing thoughts
- Lightheadedness
- Improved mood
- Difficulty sleeping
- Drowsiness
- Dizziness
- Irritability
- Anxiety

**Systemic**
- Feeling of warmth or cold

**Eyes**
- Increased tear production

**Heart**
- Increased heart rate

**Respiratory**
- Yawning

**Muscular**
- Lack of coordination

**Skin**
- Increased sweating
- Chills or gooseflesh

**Urinary**
- Increased urine production
Benzo Fury

- 6-APB
- Phenylethylamine family
- Not scheduled and not approved for human consumption by FDA
- Use is rapidly on rise
- Number of websites selling on the rise
- Sold as “research chemical”
- https://www.erowid.org/chemicals/6_apb/
“Benzo Fury”

- Effects including both positive and negative. Increased happiness, euphoria, extreme mood lift, increased self-acceptance, feelings of a peace and love toward others, increased intimacy and closeness with others, closed-eye hallucinations, ability to discuss topics with others that would not normally be discussed, pleasurable body rushes, increased sexual interest,

- Higher doses (or more potent doses) bring on a multitude of unpleasant bath salts like side effects (refer to previous slide/list).
Butane Honey Oil

• Recent resurgence
• Butane method popular
  – Fires & explosions
• Solvent with heat extracts the THC
  – 30% and higher THC
• Recipes & cook books on web
• YouTube demonstrations are exploding (no pun intended) on the “web”.
Weed Oil or “Honey”

- Onset of action longer 45 to 60 minutes
- Duration of action 6 hours and maybe longer
- Intensity of high greater due to high THC
- Can also be smoked
- Vaporizers used
- THC concentrations of 90% or more have been produced with this method.
Weed Oil or “Honey”

- Edible Marijuana
- Ice Cream
- THC infused coffee
Video examples: 2C-B

2,5-dimethoxy-4-bromophenethylamine
Video examples: BHO
Strongest THC strains 2015
Video examples: Salvia Divinorum
Video examples: Flakka
Video examples: “Bath salts”
Video examples: “Spice”


http://www.hrmvideo.com/catalog/high-on-spice-the-dangers-of-synthetic-marijuana

