Recreational Synthetic Drug Use in Our Community: Dangers of Bath Salts and Synthetic Marijuana.

Assistant Clinical Professor of Medicine
Boca Regional Medical Center Grand Rounds
September 2015
Objectives

• Emerging Crisis in South Florida
  – Broward County #1 synthetic drug abuse “Flakka” in country.
• Epidemiology of Synthetic Designer Drugs
  – Synthetic Cannabinoids
    • “Spice” or “K2”
  – Synthetec Cathinones
    • Frist Generation “Bath Salts”
    • Second Generation Bath Salts: “Flakka”
• Review Signs and Symptoms of Bath Salt and Synthetic Marijuana Ingestion
• Legal issues with Synthetic Drugs
• Clinical Side Effects
• Treatment in Hospital
• Group Discussion
Teen dies after smoking synthetic marijuana; parents warn others

Drug in bath salts caused teen's overdose death, Dr. G says

17-year-old Krystopher Sansone died of drug overdose in February

The Drug That Never Lets

By Jenny Marder

ULTRA-GOER DIED FROM SYNTHETIC DRUG ALPHA-PVP

In March, 21-year-old Adonis Peña Escoto died after a day of partying at Ultra Music Festival. Until now, the cause of his death had been a mystery. A Miami-Dade Medical Examiner report obtained New Times at last sheds some light on what killed him — and suggests that synthetic "bath salts" drugs are still a fatal problem in South Florida.
Dangerous Drug Trends in South Florida

Miami-Dade County  FEBRUARY 10, 2015

Researchers document drug use among Ultra Music Festival attendees

Fake Ecstasy Drug Kills Six in Florida

A knockoff of the popular “club drug” Ecstasy is being blamed for the deaths of six young people in Florida and at least three in suburban Chicago since May, law enforcement officials said.

The clusters of deaths in Illinois and Florida, along with sporadic reports of fatalities across the nation involving Ecstasy, underscores the dangerous nature of a drug that has been thought by many to be relatively harmless.

Emerging Trends for Two Common Synthetic Drugs in USA

Epidemiology of Synthetic Drugs

NEW DRUG WAVE TAKES TOLL
Poison centers across the country have seen a dramatic increase in calls about synthetic designer drugs.

CALLS TO POISON CONTROL CENTERS

- **Synthetic marijuana**: Cannabinoids including JWH-018, sprayed on potpourri or herbs to mimic marijuana.
- **Bath salts**: Psychoactive stimulants that mimic cocaine, amphetamine and other drugs.
- **Research chemicals**: Psychedelics including 2C-E and similar chemicals that mimic LSD and other drugs.

Source: American Association of Poison Control Centers, DEA

Senior High School Drug Use Trend 2012

Marijuana: 36%

- Synthetic Cannabis: 11.3%
- Synthetic Cathinones: 1.3%
- MDMA: 3.8%
- Hallucinogens: 5.0%
- LSD: 2.10%

*Monitoring the Future* is an ongoing study of the behaviors, attitudes, and values of American secondary school students, college students, and young adults. Each year, a total of approximately 50,000 8th, 10th and 12th grade students are surveyed.

Bath Salt Risk Exposure in High School - 2014

Percentage of students seeing a "great risk" in using once or twice.

YEAR

PERCENT

Risk
% seeing "great risk" in using once or twice


Monitoring the Future is an ongoing study of the behaviors, attitudes, and values of American secondary school students, college students, and young adults. Each year, a total of approximately 50,000 8th, 10th and 12th grade students are surveyed.
Figure 4  Synthetic cannabinoid reports in NFLIS, by State, January–June 2013*
Figure 6  Synthetic cathinone reports in NFLIS, by State, January–June 2013*
The *Sun Sentinel* Interactive Flakka Case Report Map

http://interactive.sun-sentinel.com/flakka-case/
Key Issues with Synthetic Recreational Drugs

• A number of synthetic cannabinoids and bath salt products appear to originate overseas (China, Russia...etc)
  – Easily purchased online.
• Manufactured in the absence of quality controls
• Devoid of governmental regulatory oversight.
  – Law enforcement Difficulties in seizing online distribution.
  – Easier to synthesize
  – Online distributors difficult to track in foreign countries.
• Ingredients and properties of synthetic drug continues to change and vary widely.
  – Mixed with various psychoactive agents.
  – Sometimes other designer drugs (Molly, Ecstasy contain elements of bath salts).
Ease of Internet Bath Salt Purchase

Join the official AM-HI-C newsletter AND GET A FREE SAMPLE

Buy Bath Salts & Incense Online At V2 Shop Online will never ever put any of our customers at risk by supplying any banned substance in the USA. All our formulations have been lab tested -certificates are available on request. We welcome the DEA to test all our available USA blends.

Enjoy the varieties of Bath Salts we carry online - we can sell and ship to all states without exception. Get herbal stimulation from the strong bath salts available at this online head shop. Depending on the amount of powder, you’ll get a lighter or stronger effect. On top of our great selection and low prices, we also offer free and discreet shipping. Buy Bath Salts Concentrated & We Ship to All U.S States Discreetly. Call or Text Today (347-842-0147) to Order at Cheap & Discount Rates!

LEGAL PRODUCTS AVAILABLE FOR EACH USA STATE!

There are many different types of bath salts, and each brand or type promotes a diversified collection of perks and benefits. You may be asking, ‘Where can I buy bath salts?’ There are as many places to buy bath salts online as there are types and brands. When buying bath salts, there are certainly things to keep in mind whether you order bath salts on line or from a local retailer. You should also research any company before purchasing from it. Make sure the company is reputable. Search out reviews from people who have purchased from the company, which can usually be found in on line forums or on a company’s website. If you are making a purchase on line, in addition to finding a reputable retailer, make sure that the website offers secure checkout options.

With all the benefits of using soothing, aromatic, and cleansing bath salts, the real question is which kind to buy. Researching the perks associated with each brand is key to unlocking the most beneficial and rewarding treatment. Bath salts are becoming more popular because of the healing properties associated with their use as well as their relaxing and balancing effects.
Synthetic Cannabinoids

- Marketed as “safe” alternative to marijuana since 2000’s in Europe and later in USA.
  - Europe and Russia banned sale 2010
  - Beginning in 2011 USA cities ban sale.
  - Sunrise 2012 first city in Broward and second city in state to ban
  - Not detectable by urine or toxicology screens
- Brand names include:
- Labeled as “not for human consumption” to avoid legal problems.
- Internet community main way of distribution
  - Distributors remain anonymous and difficult to track down legally
- Contain dried, shredded plant material (inert)
  - chemical additives are responsible for their psychoactive effects.
  - Vast selection of different brands and chemical additives, some more toxic than others.

New Dangerous Trend: Liquid Synthetic Marijuana “Vaping” in Youth

DEA warns of a dangerous liquid synthetic cannabis harming kids
Synthetic Cannabinoids

• Stronger & longer-lasting than traditional Marijuana
  – Better binding to cannabinoid receptors with greater effect:
    • 4x higher affinity for cannabinoid receptors (CB1) and 10 times for (CB2) receptor.
    • Longer half-life → longer lasting effects.
    • Addiction potential not as high as bath salt, but remains unknown.
  – **Extreme agonistic activity of CB receptors** shown to increase cytokine activity, immune cell regulation changes, attenuation of TNF-A, liver disease, and ischemic hypo-perfusion injury (esp with CB2 receptors).
  – Products of break-down are psychoactive
  – Metabolism, absorption, elimination process of drug poorly understood.
  – Main issue → these produces are widely mixed and chemical compound varies widely:
    – Cathinone derivatives and psychedelic products
    – Higher exposure of drug through water pipe exposure (ex Hookah)

1) Aung, M. M et al. Influence of the N-1 alkyl chain length of cannabimimetic indoles upon CB1 and CB2 receptor binding". *Drug and Alcohol Dependence; (2000) 60* 2: 133–140
Cannabinoid Receptor Physiology

The Human Endocannabinoid System

CBD, CBN and THC fit like a lock and key into existing human receptors. These receptors are part of the endocannabinoid system which impact physiological processes affecting pain modulation, memory, and appetite plus anti-inflammatory effects and other immune system responses. The endocannabinoid system comprises two types of receptors, CB1 and CB2, which serve distinct functions in human health and well-being.

CB1 receptors are primarily found in the brain and central nervous system, and to a lesser extent in other tissues.

CB2 receptors are mostly in the peripheral organs especially cells associated with the immune system.

Source Figure: http://the-human-solution.org
Different Synthetic Cannabinoid Compounds Found

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<th>2012</th>
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NMS Labs Synthetic Cannabinoids Screen, Blood (Forensic) Test

NMS Labs Data
http://www.nmslabs.com/tests/Synthetic-Cannabinoids-Screen--Blood--Forensic-/95608
Synthetic Cannabinoids Identified in U. S. NFLIS Forensic Labs

19 variations reported in 2010
n=3,286

44 variations reported in 2011
n=23,688

55 variations reported in 2012
n=41,458

U.S. DEA, Office of Diversion Control, NFLIS data, 2010-2012.
Synthetic Cannabinoid Clinical Effects

- Reddened eyes
- Anxiousness
- Hallucinations
- Acute psychosis
- Memory deficits
- Seizure
- Agitation

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- Hypokalemia
- Hypertension
- Myocardial Infarction
- Fatal Arrhythmias
- Nausea/vomiting
- Violent behavior
- Coma
- Renal Failure

****Side effects worst if combined with other recreational drugs, especially bath salts.

Acute Renal Failure

Authors: Julietta Miltello, DO, Aaron B. Heath, DO, Kevin Weiss, Natasha Bray, DO, Naomi Montague, MD, Guillermo A. Herrera, MD, Parham Effekhari, DO
Broward Health Medical Center, Ft. Lauderdale, FL

A 26-year-old Caucasian male with no past medical history presented to the emergency department with increasing abdominal pain, vomiting, and polydipsia. Social history revealed recent abuse of synthetic marijuana blend called "cloud nine." On presentation, his vital signs and physical exam were unremarkable. Pertinent laboratory data is reviewed in the Table.

Despite aggressive IV fluid hydration, the patient's renal function deteriorated leading to initiation of hemodialysis. The patient received a total 3 hemodialysis sessions with subsequent improvement in his renal function. A renal biopsy was performed (Figures 1-6) revealing acute tubular interstitial nephritis.

Figure 1. Mitotic activity with tubular damage, loss of normal tubular architecture.

Figure 2. Interstitial inflammation.

Figure 3. Tubulitis with eosinophils and mitotic figures.

Figure 4. Eosinophils in interstitium.

Figure 5. Normal glomerulus.

Figure 6. Trichrome stain revealing normal vessels.
Treatment: Synthetic Cannabinoid

- Acute management consists of:
  - Supportive care with the use of anxiolytic
  - IV fluid (normal saline 0.9%) if dehydrated or AKI
  - Observe until resolution of abnormal vital signs, vomiting, and psychiatric symptoms
    - Hyperthermia protocol
    - Telemetry
    - Vomit induced aspiration pneumonitis or respiratory failure
  - Consider ICU if obtunded or clinically unstable.
- Consult poison control center
- Rule out other toxic co-ingestions (such as bath salts, or illicit drug or ETOH intoxication).
  - Standard drug screen fail to show bath salts and synthetic marijuana.

Treatment: Synthetic Cannabinoid

• Agitation or violent behavior
  – Benzodiazepine (diazepam or lorazepam)
  – EKG to evaluate QTc prolongation (especially if considering anti-psychotic meds)

• Seizure
  – Lorazepam or diazepam

• Rhabdomyolysis
  – Correct electrolyte abnormalities
  – Normal saline 0.9% 1-2 L 1st hour then maintained
    20 ml/kg an hour while monitoring volume status.

• Chest Pain
  – Rule out pneumothorax (breath holding while using drug)
  – Myocardial infarction
  – Asthma or pneumonitis

• Dystonia
  – Use of Lorazepam or diazepam preferred

• No Role for gastrointestinal decontamination

Emergency management of the severely agitated or violent patient

Ensure staff safety
Attempt to calm patient using verbal techniques
Place physical restraints if necessary
Establish IV/O2/monitor if possible

Call security or police if any concern about violence or potential violence

Is rapid sedation needed?

Assess for medical causes of agitation:
- Hypoglycemia
- Hypoxia
- Drug overdose/poison
- Infection
- Intracranial lesion
- Others

No

Chemical restraint

Yes

Severely violent PT
- Droperidol 2.5 to 5 mg IM/IV titrate as needed
  OR
- Midazolam 2.5 to 5 mg IM/IV titrate as needed
  OR
- Midazolam 2.5 to 5 mg IM/IV
  PLUS
  Droperidol 2.5 to 5 mg IM/IV titrate as needed
  OR
- Haloperidol 5 mg IM/IV
  PLUS
  Lorazepam 2 mg IM/IV titrate as needed

Intoxication with CNS stimulant or undifferentiated PT
- Lorazepam 2 to 4 mg IM/IV
  OR
- Midazolam 2.5 to 5 mg IM/IV
  OR
- Lorazepam 2 mg IM/IV
  PLUS
  Haloperidol 5 mg IM/IV

Intoxication with CNS depressant (eg, ethanol)
- Haloperidol 2.5 to 5 mg IM/IV
  OR
- Droperidol 2.5 to 5 mg IM/IV
  OR
- Haloperidol 5 mg IM/IV
  PLUS
  Lorazepam 2 mg IM/IV

Known psychotic/psychiatric disorder
- Haloperidol 2.5 to 5 mg IM/IV
  OR
- Droperidol 2.5 to 5 mg IM/IV
  OR
- Haloperidol 5 mg IM/IV
  PLUS
  Lorazepam 2 mg IM/IV
  (some use Ziprasidone* [20 mg IM]
  OR
  Olanzapine* [10 mg IM])

Cooperative PT
- Lorazepam 2 to 4 mg orally
  OR
- Risperidone* 2 mg orally
  OR
- Olanzapine 5 to 10 mg orally

In elderly patients reduce the dose of any antipsychotic by half

Sedation achieved?

Yes

Establish IV/O2/monitor if not already in place
Obtain ECG to check QT interval as needed

No

Titrate chemical restraints to desired effect

ECG: electrocardiogram; IM: intramuscular; IV: intravenous; PT: patient.
* The safety of atypical antipsychotics in geriatric patients remains uncertain.
Cathinones

- Naturally occurring beta-ketone amphetamine analogues found in leaves of:
  - *Catha Edulis* (Khat) plant
- Chewing on leaves produces amphetamine-like sympathomimetic effects
  - Psychoactive effect, euphoria, increase alertness, agitation, tachycardia, hypertension.
- Common origin and use in Middle East & African countries.
  - Particularly Yemen.

Synthetic Cathinones aka (Bath Salts)

- Synthetic Cathinones are beta keto-phene-thylamines which are structurally similar to amphetamines.
- Could be MDPV, 4-MMC, A-PVP (Flakka), mephedrone, methylone
  - Potent CNS Stimulant → acting as Serotonin/Norepinephrine/Dopamine reuptake inhibitors.
  - “Serotonin syndrome” like effects.
- Sold online and poorly regulated by governmental agency
  - Falsely marketed as “Jewelry cleaner, plant food, stain remover, fertilizer, insect repellant”
  - “Not for human consumption” or “Research use only”
- Advertised on street as “legal highs”, “legal meth”, “legal cocaine or ecstasy”
- Serious side effects include tachycardia, hypertension, arrhythmia, psychosis, convulsion, and organ failure.
- Taken oral, inhaled or injected.

Synthetic Cathinones

Number of National Crime Lab Reports for MDMA and Synthetic Cathinones: USA 2004-2013

Source: US DEA - National Forensic Laboratory Information System (NFLIS) 2013 Annual Data


Synthetic Bath Salt Methylone aka “Molly”
Legal Background of Natural and Synthetic Cathinones

• First synthetic one identified as meth-cathinone produced in 1928.
• Natural cathinone products listed 1990 as schedule I substances.
• 2007-2009 Europe and US market notices rise in synthetic cathinone uses.
• 2011 DEA scheduled three synthetic cathinones as schedule I drugs.
Legal Regulation of Synthetic Drugs

- Prior to 2010, synthetic cannabinoids were not controlled by any State or at the Federal level.
- One problem, few expensive drug kit tests can accurately identify bath salts for legal action.
  - Harder for police to arrest or prove bath salt ingestion.
- The Synthetic Drug Abuse Prevention Act 2012, signed into law by President Obama.
  - The law permanently places 26 types of synthetic cannabinoids and cathinones into Schedule I of the Controlled Substances Act (CSA).
High Potential For Addiction

- Low cost ($5-$10 a gram compared to cocaine $80+/gm.)
- Easy to obtain (via internet or wholesale or street sale)
- Physiologically activates brain reward circuitry leading to serious addiction potential (rat model).
- Often used with other illicit drugs or alcohol.
- Heightened sensation of euphoria, increased energy, and sexual arousal.
  - Snorted, inhaled in tablets, or injected syringe.
- Users frequently compulsion to re-dose repeatedly to prolong drug’s effect.
  - Leads to psychosis, self-mutilation habits, suicide ideation when drug wears off, and sometimes permanent psychosis or encephalopathy.

Bath Salt and Effects on Brain in Rat Study

- Study shows bath salts have effects beyond dopamine reward system.

- After use of bath salts, communication breakdown

- Prelimbic cortex involved in:
  - Attention
  - Personality expression
  - Decision making
  - Moderating social behavior
  - Viscero-motor activity

M. Febo et al. *Functional mapping of the central actions of the powerful bath salt MDPV and its effects on resting state brain activity.*
## Common Synthetic Cathinones

<table>
<thead>
<tr>
<th>Compound</th>
<th>Alternative names</th>
<th>Product names</th>
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</thead>
<tbody>
<tr>
<td>Cathinone</td>
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<td>Khat</td>
</tr>
<tr>
<td>Methcathinone</td>
<td>Ephedrine, β-keto-methamphetamine</td>
<td>Bubbles, Meow Meow, MCAT</td>
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<tr>
<td>Mephedrone</td>
<td>4MMC (4-methylmethcathinone)</td>
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<tr>
<td>Methedrone</td>
<td>4-Methoxymethcathinone, β-keto-PMMA, PMMC</td>
<td>Explosion, Impact</td>
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<tr>
<td>Methylone</td>
<td>B-keto-MDMA, MDMC</td>
<td>Energy-1, NRG-1</td>
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<td>Naphyrone</td>
<td>Napthylpyrovalerone</td>
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<td>Butylone</td>
<td>β-keto-MBDB</td>
<td>Bath salts, Ivory Wave, Vanilla Sky,</td>
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<tr>
<td>MDPV</td>
<td>3,4-Methylenedioxyppyrovalerone</td>
<td>Hurricane Charlie, Cloud 9, Scarface,</td>
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<td></td>
<td></td>
<td>Red Dove, White Dove, White Rush,</td>
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<tr>
<td></td>
<td></td>
<td>White Lightning</td>
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<tr>
<td>4-Fluoromethcathine</td>
<td>4-FMC, flephedrone</td>
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<tr>
<td>3-Fluoromethcathine</td>
<td>3-FMC</td>
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FIGURE 1: Similar chemical structures of catinone, D-amphetamine, and methamphetamine (top row), the “first generation” synthetic catinones mephedrone, MDPV, and methylone (middle row), and the “second generation” synthetic catinones α-PVP and 4-MEC.
Common Bath Salt Street Names

- Arctic blast
- Bloom
- Flakka
- Cloud 10
- Ivory White
- Lady Bubbles
- Lunar Wave
- White Dove
- Snow Leopard
- Mystic
- Route 69
- Gold Rush
- Blue magic
- Scarface
Online Ordering of Bath Salts

V2 Bath Salts & Incense

Products List:
- Bath Salts Page 1
- Bath Salts Page 2
- Bath Salts Page 3
- Bath Salts Page 4
- Bath Salts Page 5

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Top Quality Bath Salts Powder Blends
Novelty Collector’s Item

Concentrated White Dove 500mg
WHITE DOVE 500mg novelty collectible is a vital collector’s item that is known for its glow. Enhanced Collector's ItemComes in powder form in a small, reusable, and easy to carry canister.

Concentrated White Sands...
WHITE SANDS BATH SALT/MULTIPURPOSE SOLUTION 500mg is sure to provide a WONDERFUL BATHING EXPERIENCE that will leave you feeling as clean and refreshed as a walk along a tropical beach.

Concentrated White Tile 500mg
White TILE 500mg MULTI-PURPOSE SOLUTION is a vital collector’s item that will have you feeling as clean and fresh as a scrubbed white tile floor.

Best Seller

Users Online
User Online: 11
Today Accessed: 956
Total Accessed: 19043

We Ship Via
EMS, FedEx
Synthetic Cathinones Identified in U.S. NFLIS Forensic Labs

- **2010**: 17 varieties identified, n=731
  - MDPV: 52%
  - METHYLINE: 11%
  - 4MMC: 33%
- **2011**: 34 varieties identified, n=6,949
  - MDPV: 53%
  - METHYLINE: 26%
  - 4-MEC: 4%
  - 4-MM: 5%
- **2012**: 48 varieties identified, n=14,239
  - METHYLINE: 23%
  - MDPV: 21%
  - ALPHA-PBP: 18%
  - PENTEDRONE: 5%
  - 4-MMC: 20%

U.S. DEA, Office of Diversion Control, NFLIS data, 2010-2012.
Alpha Pyrrolidino-pentiophenone aka “Flakka”

• Derivative analogue of popular bath salt MDPV (methylenedioxy pyrovalerone).
• Termed “Second General Bath Salt” since first generation was made illegal in 2001
• Acts as a Serotonin/Norepinephrine/Dopamine reuptake inhibitor.
  – Marked sympathetic effects
  – High addiction ability
• Takes the form of a white or pink, foul-smelling crystal that can be eaten, snorted, injected, or vaporized in an e-cigarette or similar device.
• Like other bath salts, alpha-PVP can cause a excited delirium, hyper stimulation, paranoia, and hallucinations that can lead to violent aggression and self-injury.
## A-PVP (Flakka) Side Effects

<table>
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<tr>
<th>Category</th>
<th>Side Effects</th>
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<tr>
<td>Cardiovascular</td>
<td>Chest pain, hypertension, palpitations, myocarditis, tachycardia</td>
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<tr>
<td>ENT</td>
<td>Epistaxis, oral and pharyngeal effects, tongue disorder</td>
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<tr>
<td>Gastrointestinal</td>
<td>Abdominal pain, abnormal liver function tests, nausea, liver failure</td>
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<tr>
<td>Musculoskeletal</td>
<td>Elevated creatinine kinase, peripheral vasoconstriction, rhabdomyolysis</td>
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<td>Neurologic</td>
<td>Agitation, aggression, altered mental status, collapse, confusion, dizziness, drowsiness, dystonia, headache, hyperreflexia, myoclonus, paraesthesias, seizures, tremor</td>
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<tr>
<td>Ophthalmologic</td>
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<tr>
<td>Pulmonary</td>
<td>Shortness of breath, tachypnea</td>
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<tr>
<td>Psychological</td>
<td>Anxiety, confusion, delusions, hallucinations, paranoia, psychosis</td>
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<tr>
<td>Renal</td>
<td>Abnormal renal function, acute renal failure</td>
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<tr>
<td>Other</td>
<td>Diaphoresis, fever, hyponatremia, rash</td>
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</table>

Case reports

Death due to intravenous use of α-pyrrolidinopentiophenone

Intoxication with synthetic cathinones (psychoactive designer drugs) can involve cardiovascular, autonomic, neuromuscular and neuropsychiatric features. We report a case of cardiac arrest and subsequent death in a 44-year-old man after intravenous use of one such drug — α-pyrrolidinopentiophenone. We believe this is the first death associated with this drug to be reported in Australia. Currently, no specific antidote exists for cathinone exposure.

- First case report of death after use of A-PVP
  — Medical Journal of Australia 2014
- Severe hyperthermia, cardiac arrest, and Rhabodmyolysis.
- Cerebral edema with severe hyponatremia (Na 118).
- Markedly abnormal CT scan of brain with tonsilar herniation and cerebral infarction.

Dangerous Drug Trends in Community

• Clinical Clue to Flakka use:
  – Agitation / delirium / hyperthermia / bizarre behavior
• Flakka related deaths as of August 2015 in Fort Lauderdale:
  – 34 deaths
  – Broward Health District hospitals average 8-20 patients a day in ER.
• Highly addictive and “affordable high”
• Big problem amongst youth and homeless
  – Sold as candy / gummy bear
  – Flakka now mixed in batches of cocaine, molly, heroin, crystal meth, etc.
  – Resembles white crystal or crushed as powder
Distribution of Flakka in Candy

Flakka Now Made To Look Like Candy
July 9, 2015 12:27 PM

Flakka Now Made To Look Like Candy. CLICK HERE To Watch Gaby Fleischman’s Report.

Related Tags: Candy Flakka, Crime, Detective Daniel Ferrin, Drugs In South Florida, Ethylone, Flakka, Fort Lauderdale Police Department, Gaby Fleischman, South Florida Drugs, Stephen Snipes

Gaby Fleischman
Gaby Fleischman is a reporter at CBS Miami, where she covers d...
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MIAMI (CBSMiami) — The synthetic drug that has spread through South Florida streets is now coming in a new form and it's marketed for children.
Treatment: Bath Salt Intoxication

• Supportive care, no antidote available
• Aggressive sedation with benzodiazepines (for agitation, seizures, tachycardia, and hypertension)
• Significant hyperthermia may require passive or active cooling
• Lab studies including electrolytes, renal and liver function tests, cardiac markers, and creatine kinase (CPK) should be considered
• Very high risk for arrhythmia and renal failure from rhabdomyolysis.

ER Treatment: Bath Salts

• Safely sedating and calming agitated patient
  – Higher dose IV lorazepam (2mg) or Diazepam (10mg)
  – Often require physical restraints to avoid harming staff with chemical sedation
  – No clear evidence for Haldol or 2\textsuperscript{nd} generation anti-psychotics as 1\textsuperscript{st} line treatment (remember side effect of \textit{QTc interval prolongation} and lower seizure threshold for these drug classes)

• Airway protection

• Evaluation of electrolytes and renal function
  – Aggressive IV fluid repletion (Normal Saline) at least 1-2 Liters.
  – Dialysis commonly employed for severe rhabdomyolysis cases that fail to improve with IV fluid.

• EKG (\textit{QTc} prolongation common)

• Telemetry admission

• If violent or agitated, consider ICU or more closely monitored unit

• May need 1:1 sitter

• Avoid confrontation with patient- call security for assistance.

Summary

• Prompt recognition and screening for synthetic drug use through detail HPI essential.
• Understand that synthetic designer drug compounds vary and composition changes (and may be mixed with unknown substances that have toxic potential)
• Sometimes, other impure drugs (Ecstasy, Fake Heroin, etc) contain bath salts.
• Flakka (A-PVP) is the new second generation bath salt and carries high morbidity and mortality and very popular in South Florida.
• Synthetic drugs are not detectable by routine ER drug screen testing.
• For synthetic cathinones and bath salts look altered mental status, psychosis, delirium, hyperthermia and sometimes violent behavior.
• Common to have rhabdomyolysis, renal failure.
• Contact poison control center if any questions.
• Monitor cardiac, renal and liver function.
Resources

Articles and Review Papers:


Government Websites

• National Institute on Drug Abuse, [www.nida.nih.gov](http://www.nida.nih.gov)
• American Association of Poison Control Centers, [www.aapcc.org](http://www.aapcc.org)
• Drug Enforcement Administration, [www.dea.usdoj.gov](http://www.dea.usdoj.gov)
Resources

Articles and Review Papers:

4) The harmful chemistry behind Krokodil synthesis and mechanism of toxicity. Forensic Science Int. 249 (2015); 207-213.

Government Websites

• National Institute on Drug Abuse, [www.nida.nih.gov](http://www.nida.nih.gov)
• American Association of Poison Control Centers, [www.aapcc.org](http://www.aapcc.org)
• Drug Enforcement Administration, [www.dea.usdoj.gov](http://www.dea.usdoj.gov)
Thank You
Desmophine “Krokodil” Drug

- Krokodil street name for cheap substitute for heroin, initially observed in Russia 2002.
- Desmophine is semi-synthetic opioid
  - Analgesic effects 10x greater than morphine and cheaper.
- Process starts by using codeine tablet \( \rightarrow \) make Desmophine.
  - Codeine tablet + alkali solution + organic solvent+ acidified water + iodine and red phosphorus.
  - However “actual chemistry” varies (solvents, paint thinner, gasoline etc often used during process).
  - Hydriodic acid and red phosphorus dangerous – corrosive.
  - Gas iodine produced during process – muscle damage
- Injected intravenously.

### Toxic Side Effects of “Krokodil”

#### Table 1
Toxic effects related to krokodil exposure [3,5,39,46,56].

<table>
<thead>
<tr>
<th>Effect Type</th>
<th>Toxic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local toxic effects</strong></td>
<td>Abscesses, gangrene, thrombophlebitis, limb ulceration and amputations, jaw osteonecrosis, skin discoloration, black and open ulcers, necrosis, skin and soft tissue infection, necrosis, bleeding, rotting gums and ears, scabs, popped skin lesions</td>
</tr>
<tr>
<td><strong>Systemic toxic effects</strong></td>
<td>Blood vessel, muscle, cartilage and bone damages, multiple organ failure, hypothyroidism, liver and kidney inflammation, pain, swelling, endocarditis, pneumonia, meningitis, pale skin, low blood pressure and heart beats, swollen hands, death</td>
</tr>
<tr>
<td><strong>Neurotoxicity</strong></td>
<td>Loss of cognitive functions, speech difficulty and changes of personality, loss of memory, hallucinations</td>
</tr>
</tbody>
</table>

Desmophrine “Krokodil”

Miscellaneous Photo References

As Presented in Slide 2 of Power Point Presentation: