Drug Trends Update
“New Drugs”

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Synthetic Drugs

- Not really “Spice,” “Bath Salts,” “Incense,” or “Plant Food”
- Chemically-based; not plant derived
- Complex chemistry
- Constantly changing to “stay legal”
Will They Turn You into a Zombie? What Clinicians Need to Know about Synthetic Drugs (2nd Edition)

Cannabis vs. Cannabinoids: Clinical Cases

Most symptoms are similar to cannabis intoxication

- Tachycardia
- Reddened eyes
- Anxiousness
- Mild sedation
- Hallucinations, acute psychosis
- Memory deficits

Symptoms not typically seen after cannabis intoxication

- Seizures
- Hypokalemia (low potassium)
- Hypertension (high blood pressure)
- Nausea/vomiting
- Coma
- Agitation, violent behavior

Schneir 2012 J Med Tox
Rosenbaum et al. 2012 J Med Chem
Forrester et al. 2011 J Add Dis
Hermanns-Clausen et al. 2012 Addiction
Synthetic Cathinones: Bath Salts

• Mimics the effects of the Khat Plant.
• Could be 4-MMC, mephedrone, or over 37 other varieties.
• Sold on-line with little info on ingredients, dosage, etc.
• Advertised as Legal Highs, Legal Meth, Cocaine, or Ecstasy.
• Taken orally or by inhaling; injectors report abscesses and pain.
• Serious side-effects include tachycardia, hypertension, confusion or psychosis, nausea, convulsions.*
• Labeled “not for human consumption” to get around laws prohibiting sales or possession.
• Austin outreach workers report bath salt use declined quickly among injecting drug users

*Wood & Dargan, Novel Psychoactive Substances: How to Understand the Acute Toxicity Associated with the use of these substances, Therapeutic Drug Monitoring, 34: 363-367, 2012.
Attitudes That Use of Synthetic Cannabis Once or Twice was Harmful by Age Group and Prevalence of Use: Monitoring the Future 2012-2013

Decreased Use by 18 Year Olds Between 2012 and 2013
Comparison of Texas Poison Control and Treatment Cases: 2012-2014

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>% Male</td>
<td>71%</td>
<td>74%</td>
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<tr>
<td>Average Age</td>
<td>23</td>
<td>23</td>
<td>29</td>
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<tr>
<td>Intended to Abuse</td>
<td>88%</td>
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<td>88%</td>
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<tr>
<td>Moderate Effect (returns to pre-exposure state)</td>
<td>42%</td>
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<td>47%</td>
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<tr>
<td>Major Effect (life threatening)</td>
<td>6%</td>
<td></td>
<td>12%</td>
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<tr>
<td>Deaths</td>
<td>4</td>
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<tr>
<td># Exposures</td>
<td>2135</td>
<td>412</td>
<td>583</td>
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SOURCE: Texas DSHS
Characteristics of Synthetic Cannabis Users in Texas Drug Treatment

- 412 admitted to publicly-funded treatment in Texas in 2013.
- Average age 23; had been using the drug 2.5 years prior to treatment admission.
- 75% male; 52% white, 38% Hispanic, 6% black.
- Only 38% had no legal problem.
- 33% lived with family; 6% homeless.
- 8% employed full time; 45% unemployed.

SOURCE: Texas DSHS
Synthetic Cannabis Items Identified and Reported to NFLIS:
2010-1/2 2014

2010: 3,285 seizures, 18 subst.
2011: 22,957 seizures, 32 subst.
2012: 42,709 seizures, 46 subst.
2013: 33,239 seizures, 47 subst.
From the term “Bath Salts” to...

**Synthetic Cathinones**
Mephedrone, methylone, 4-MEC, MDPV, Alpha-PVP
Stimulants related to methcathinone, MDMA, amphetamines

**2C Phenethylamine**
Created to imitate MDMA
Psychedelics related to mescaline
MDA, MDEA, 6-APB, DOM, DOB,

**Tryptamines**
5-MeO-DMT & 4-AcO-DMT
Psychedelics related to psilocin & bufotenin

**Piperazines**
BZP & TFMPP
Stimulants (fake ecstasy)
MeOPP

And **Dissociatives** related to ketamine and PCP and **Opioids** with varying potencies of morphine: 80%, 5.4x potency, 10,000 times potency.
Synthetic Cathinone Items Identified and Reported to NFLIS: 2000-1/2 2014

- 2010: 729 seizures, 10 subst.
- 2011: 6,766 seizures, 21 subst.
- 2012: 14,604 seizures, 31 subst.
- 2013: 15,284 seizures, 26 subst.

Source: US NFLIS.
Psychadelics

- 5'-substituted tryptamines
  - Related to: bufotenin
  - 5-MeO-DMT
  - 5-MeO-DALT
  - 5-MeO-MPT
  - 5-MeO-MET
  - 5-MeO-DIPT
  - 5-MeO-AMT
  - 5-MeO-AET

- NBOMe series
  - Related to: 2C-x series
  - 2C-NBOMe
  - 25I-NBOMe
  - 2SD-NBOMe

- 2C-x series
  - Related to: mescaline
  - 2C-B
  - 2C-D
  - 2C-I
  - 2C-E
  - 2C-T-7
  - 2C-P
  - 2C-B-FLY

- Ergolines
  - Related to: LSD, LSA
  - ALD-51
  - LA-55-Ac (LSZ)
  - PRO-LAD
  - ETH-LAD

- 4'-substituted tryptamines
  - Related to: psilocin
  - 4-AcO-DMT
  - 4-HO-DPT
  - 4-AcO-DET
  - 4-HO-DALT
  - 4-AcO-MPT
  - 4-HO-DIPT
  - 4-MES-DMT

- Psychedelic amphetamines
  - Related to: 2C-x, amphetamine
  - DOB
  - DOM
  - DOC
  - DCET
  - DOI
  - TMA-2
  - Bromo-dragonFLY

Cannabinoids

Functionally related to naturally occurring cannabinoids including THC

- Naphthoylindoles
  - JWH-018
  - JWH-019
  - JWH-073
  - JWH-081
  - JWH-122
  - JWH-200
  - AM-1221
  - AM-2201

- Phenylacetylindoles
  - WIN-55,212-2
  - CP-47,497
  - CP-47,497, C8 homologue
  - CP-55,940

- Naphthoylpyrroles
  - JWH-307
  - JWH-175

- Cyclopropanoylindoles
  - UR-144
  - 5F-UR-144
  - A-934,735
  - A-796,260

- Benzoylindoles
  - AM-694
  - AM-1241
  - AM-2233
  - RCS-4

Stimulants

- Cathinones
  - Related to: methcathinone, cathinone, amphetamine, MDMA
  - Mephedrone
  - Pentedrone
  - Methylenedioxymethamphetamine
  - Butylone
  - bk-PFMMA
  - Benzedrone
  - 4-MEC

- Piperazines
  - Related to: piperazine
  - BZP
  - mCPP
  - MBZP
  - pPFPP
  - DBZP
  - MeOPP
  - MDBZP
  - TFMPP

- Phenylalkylpyrrolidines
  - Related to: Pyrovalerone, Prolintane
  - NDFV
  - α-PVP
  - NDFVP

- Substituted amphetamines
  - Related to: amphetamine, methamphetamine
  - 4-FA
  - 3-FMA
  - 4-FMA
  - PMA
  - 3-FA
  - PMMA

Dissociatives

- Related to: ketamine, PCP
  - Methoxetamine
  - 3-MeO-PCP
  - 4-MeO-PCP
  - 3-MeO-PE
  - 2-MeO-ketamine

Sedatives

- Opioids
  - Related to: morphine, fentanyl, heroin
  - α-methylfentanyl
  - 3-methylfentanyl
  - 4-iodopiperidine
  - O-desmethytramadol
  - 7-acetoxyxymorphone
  - Metonitazene
  - AH-7921

- Phenazines
2C Phenethylamines

• Phenethylamines (stimulant and hallucinogenic effects—Bees, Nexus, etc.). Almost all of the 2C phenethylamines are produced in Asia, but some small labs in the US are capable of producing 2C (usually 2C-B).

• NFLIS Labs nationwide identified 193 reports of phenethylamines in 2010, 340 in 2011, 1097 in 2012, and 1876 in 2013.
2C-C-NBOMe, 2C-I-NBOMe, Mescaline-NBOMe

- Analogs of the 2C-X family of phenethylamines
- Strongly active at the sub-milligram dose (a Super Potent drug)
- Most 25I and 25C is sold as pure powder, liquid, or blotter.
- Risk of confusing one white powder for another or simply misunderstanding the difference between one psychedelic or stimulant drug and another
- Obtained from China.
- NFLIS Labs nationwide identified 10 reports of 2-C-Nbome variations in 2011, 480 in 2012, and 1563 in 2013.
- Weighing and handling pure high-potency chemicals such as 25I-NBOMe should be performed wearing eye protection, gloves, and a filter mask (at a minimum).

Tryptamines

• Related to psilocin, and they have hallucinogenic effects

• They are naturally occurring (toad, shamantic brews)

• They are smoked: almost immediate effects, very intense, short effect (<30 min)

• 5’-substitute tryptamines related to bufotenin, 5-Meo-DMT, etc.

• 4’-substitute tryptamines related to psilocin mushrooms 4-HO-DALT, etc.
Piperazines

- Frenzy, Bliss, Charge, Herbal ecstasy, A2, Legal Z, Legal E.
- Mainly available over internet and sold as ecstasy pills that are “safe.”
- Two classes: (1) benzylpiperazines (BZP) and (2) phenylpiperazines (TFMPP).
- Mimics effects of ecstasy (MDMA); dangerous with seizure disorders, psychiatric illness, or coronary disease.
- Adverse events included hypertension, reduced consciousness, psychotic episode, hallucinations, tachycardia, hyperthermia, coma. Could be toxic if combined with MDMA or amphetamines.

Glimpses of MDMA Situation in U.S.: 1999-2013

Results of Pill Tests Containing MDMA*

MDMA Items Identified in DEA’s NFLIS Tox Labs: 2004-2013

Mephedrone and methylone act on the brain like MDMA

*http://www.ecstasydata.org/stats_substance_by_year.php

Baumann, M.H., et al. The designer methcathinone analogs, mephedrone and methylone, are substrates for monoamine transporters in brain tissue. *Neuron-psych*
New MDMA Warning
Watch out for Molly!

• “Molly” initially referred to ecstasy pills with high quality MDMA powder. With MDMA shortage, now have more caffeine, meth, & methylone with little MDMA in them.

• European Monitoring Centre for Drugs and Drug Addiction issued warning in February 2014 that “dangerously high” levels of MDMA are appearing in Europe.

• MDMA tablets in the EU in 2012 contained 60 – 100 mg of MDMA, but tablets containing 150 and 200 mg of MDMA are currently available and can contain even higher amounts, e.g. 240 mg.
Changes in Psychoactive Substances Identified in Forensic Laboratories in US: 2004-2013

Changes in Psychoactive Substances Identified in Forensic Laboratories in US: 2004-2013

New Issues?

• Need better way to disseminate information on harms of new drugs. Adults know very little about them. How can parents talk to their kids when they have no idea what they are talking about?

• Phenethylamines. Need better categorization of these drugs, particularly those with amphetamines such as DOM, DOB, etc.

• Need information on the new and “more potent” generation of cannabinoids and opioids.
METHAMPHETAMINE

Different Manufacturing Processes

I. Ephedrine/Pseudoephedrine Based (d-form): (1% of samples tested)
   A. “Nazi Method”-lithium, anhydrous ammonia
   B. Cold method-red phosphorus, iodine crystals
   C. “One Pot” and “Shake and Bake” cooking using dry ammonia nitrite and cough syrup rather than liquid anhydrous ammonia.

II. P2P/Phenylacetone (Illegal in US-Schedule II, precursors legal in Mexico) (l and d,l-forms): (95% of samples tested).

If drug is 100% potent, it’s all d-form. If 0% potent, is all l-form. Mexican chemists are refining their process to produce more potent P2P meth.

Production Routes
- P2P
- Pseudoephedrine

Purity and Potency
- Purity
- Potency

Source: DEA

Methamphetamine

- Indicators are now equal to or at higher levels than before the ban on pseudoephedrine. Proportion of NFLIS items that were meth rose from 19% in 2012 to 24% in 2014 in Texas. Only cannabis more frequently identified in Texas in 2014.
- Purity & potency across US remain at 95-96% which means the cooks have figured out how to get rid of the \( l \)-isomer.
- Areas which had traditionally been dominated by heroin now reporting increasing problems with meth and new users becoming psychotic in short period of time due to potency.
- More crystal meth use among young MSM and high-risk heterosexual populations.
- STDs being spread by use of GRINDR© and Craig’s List© but outreach workers also using these apps to locate their cases.
- Meth can be brought in from Mexico as powder dissolved in water and converted to crystal in the US.
Indicators of Methamphetamine Trends in Texas: 1998-2013
A Few Other Substances to Throw in the Mix…

- **Ketamine** - dissociative anesthetic that distorts perceptions of sight and sound, and can produce feelings of detachment.
- **Kratom** – opioid-like effects
- **Krokodil** – cheap heroin replacement
- **Salvia divinorum** – hallucinogenic effects
- **Methoxetamine** – “legal ketamine”
- **Benzo Fury** (5-APB) – stimulant and hallucinogenic effects
- **GHB** - sexual assault with it.
- **LSD**
- **Rohypnol** - along the Texas-Mexico border.

Phencyclidine

• PCP, Angel Dust, Killer Weed
• Dissolved in embalming fluid (“Fry,” “Amp,” “Water, Water”).
• Swallowed, sniffed, smoked on joints dipped in “Fry”.
• Out-of-body strength.
• Dissociative drug like DXM and ketamine; effects are similar to cathinones.
PCP Indicators in Texas: 1997-2013


# PCC Calls

# Treatment

# Tox Items Examined
What is **DxM**? *Dextromethorphan* is a psychoactive drug found in common over the counter cough medicines.

Dextromethorphan (DXM)

- At high doses, may produce dissociative hallucinations (distance from reality, visual effects with eyes open and closed; perceptual changes, drug liking, mystical-type experiences similar to use of psilocybin.*
- Can produce tachycardia, hypertension, agitation, ataxia, and psychosis at high doses.
- Dose-dependent use pattern to try to gauge the amount they need to take to produce the desired effect, which is one of 5 plateaus.


Source: DSHS
Enter your weight in pounds: 150

Second Plateau

Cough Syrup

Powder

Strength: 2 mg/mL

Calculate DXM Needed

You must drink between 85mL and 256mL of cough syrup to achieve your desired high!

Quit DXM Calculator

About
Internet

- Consists of two components
  - **Surface web**
    - Search engines we use on a daily basis
      - Google
      - Yahoo
    - Functions off an index system
      - Locates domains that follows hyperlinks from other domains
      - Data in-capabilities that do not allow the index to search into the deep web
  - **Deep web**
    - Technical obstacles
      - Timed-entry
      - Password access
      - Require deliberate search into a website
      - Not always bad
  - **Dark web**
    - Small portion of the web that is intentionally hidden
    - Inaccessible through standard web browsers
Purchase Menu

- Illegal services:
  - Copyrighted media, hit-men/contract killings
  - Human trafficking, child pornography
  - Illegal firearms, illegal drug trade- Silk Road

- Identity Theft:
  - New passport, ID, social security number, stolen credit card numbers

- Bit-coin:
  - On-line encrypted currency, no banks involved, completely anonymous
  - Delivery through FedEx, UPS, DHL, etc.
Krokodil

- Russian cheap replacement drug for heroin made from cooking down desomorphine with gasoline, paint thinner, alcohol, iodine, red phosphorous (match heads), etc.
- In Russia, lack of clean needles, methadone, poverty, high numbers of HIV+ individuals, etc.
- Injuries due to bacteria, toxic adulterants, gangrene, staph, streptococclis, infection
- No verified cases in the US since 2004—most were just serious wound infections reported by people who had never seen such injuries.
NEEDLES & RISKS

• Role of needles in transmission of HIV/AIDS, HCV, STD—not just heroin. Focus on dangers of dirty needles for abscesses, MRSA, streptococcus (and skin infections that could be publicized as Krokodil) as well as transmission of HIV/AIDS.

• Increase focus on non-injected party drugs/meth and social networking for increased risky anonymous sex. (And counter the assumption that HIV is easy to treat, so condoms not needed).
Hepatitis C

• HCV is the leading cause of liver failure and liver transplantation in the U.S. Up to 70% of injectors test positive for HCV.

• Many injectors are unaware of their HCV status and do not know about treatment options. All IDUs or ever IDU need screening.

• Deaths due to AIDS are decreasing but deaths due to liver disease are increasing. Avoid alcohol and Rx and OTC drugs that can potentially damage the liver, such as non-aspirin pain relievers.

• Two new FDA approved drugs: Boceprevir (Victrelis) & Telaprevir (Incivek). Used in combination with either Interferon or Ribavirin.

• Everyone working in this field should have HBV vaccination.

• DO WE TEACH OUR CLIENTS WHO ARE HCV+ HOW TO AVOID INFECTING OTHERS? Risk for sex partners, sharing personal items that might have blood on them and cover cuts and sores on skin. Use same precautions for HIV.

*Larney at al., The contributions of viral hepatitis and alcohol to liver-related deaths in opioid-dependent people, Drug and Alcohol Dependence 131 (2013) 252-257.
Percent of Texas AIDS Cases Reported by Selected Modes of Exposure and Injectors Entering Treatment: 1987-2013

Source: DSHS
Texas Male and Female AIDS Cases by Race/Ethnicity: 1999-2013

- Hispanic Male
- Black Male
- White Male
- Hispanic Female
- Black Female
- White Female
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http://www.utexas.edu/ssw/cswr/institutes/ari/research/drug-trends/
Or google GCATTC