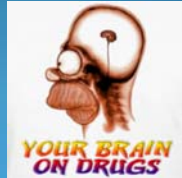


New Drugs of Abuse

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Drugs of Abuse

- New York State at a Glance (2008) ⁽²⁴⁾
 - One of the top ten states for drug-use rates in several categories:
 - Marijuana use among young adults age 18-25
 - Cocaine use among persons age 12 and older
 - Approximately 9 % of residents reported past-month use of illicit drugs;
 - National average was 8 %.
 - Heroin is the most commonly cited drug among primary drug treatment admissions
 - 3.54 percent of residents reported using an illicit drug other than marijuana in the past month
 - **Drug-Induced Deaths**
 - As a direct consequence of drug use, 1,909 persons died (2007)
 - Persons in who died from motor vehicle accidents (1,478)
 - Firearms (985) in the same year.

Introduction

- Drug Users/Makers
 - Seeking new highs
 - Using old drugs in new ways
 - Creating designer drugs
 - Legal
 - Less expensive
 - Less contaminated
 - More readily available
 - More desirable physiologic effects



Case 1

- A 35 year old male, who usually only uses marijuana, presents to the ED after smoking something “new”. He says his dealer was recently arrested, so instead he bought something from a “friend” who had gotten something from a local tobacco shop.
- After smoking it, he felt nauseous, had palpitations, he felt “high” but not a good high, and thought his dead grandmother was telling him to “run into the forest and not come back”.
- He became frightened and came to the ED

“Spice”

Known as “herbal highs”
⁽¹⁶⁻¹⁹⁾

- Sold
 - Internet
 - Head Shops
 - Tobacco Shops
- Available
 - Since 2006
 - In 2008
 - Became widely available via internet, smoke shops
 - \$25-40 for a 3g packet ⁽⁶⁸⁾



Spice

- Known as
 - Spice
 - Herbal Essence
 - K2
 - Lava Red
 - Aroma
 - Dream
 - TaiFun
- Advertised as ⁽¹⁶⁾
 - Room Odors
 - Herbal Incense
 - Animal feed
 - Plant fertilizer
 - Collectibles
 - Not for human consumption

Spice

- Said to contain
 - Natural plant products
 - Baybean, Blue Lotus, Lion's Tail, Lousewort, Indian Warrior, Dwarf Scullcap, Maconha Brava, Pink Lotus, Marshmallow, Red Clover, Rose, Siberian Motherwort, Vanilla and Honey.
 - Psychoactive? Stimulant?
 - Synthetic Cannabinoids ⁽¹⁶⁻¹⁹⁾
 - JWH-018 / JWH-073/JWH-122
 - HU-210
 - CP-47,497 homologues

Synthetic Cannabinoid

- JWH-018
 - 1-naphthalenyl(1-pentyl-1H-indol-3-yl)methanone
- Clemson University
 - "potential development of new pharmaceutical products and an exploration of the geometry of both the cannabinoid brain (CB1) and peripheral (CB2) receptors"



John W. Huffman



Pharmacology

- Synthetic Cannabinoids ⁽¹⁶⁾
 - Possess higher affinity for CB₁ and CB₂ receptors than THC
 - May have up to 10x greater affinity
 - Higher potency
 - Lower doses cause clinical effects
 - HU-210
 - Reported to have 100x the potency of THC

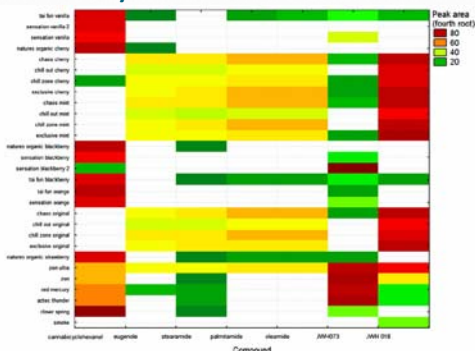
Difficult to know how much synthetic product per use

- Tens to hundreds of mg/sample
- Many preparations/types

- Variations ⁽¹⁶⁾
 - Among the same product
 - No reliable similarities of type of synthetic cannabinoid
 - Leads to confusion by user
 - Can be dangerous
 - Type of synthetic cannabinoid depended on flavor



Similarity based on Flavor? ⁽¹⁶⁾



Flavor

- Vanilla
 - Cannabicyclohexanol
- Cherry
 - JWH-018
- Blackberry
 - Cannabicyclohexanol
- Natural Smoke Flavor
 - JWH-073



Clinical Effects

- Tachycardia
- Xerostomia
- Hypertension
- Hallucinations
- Seizure
- Psychosis
- Weakness
- Coma
- Dependence
- Withdrawal



Paraphrase

"it made me feel wasted. It made me not feel like myself. I was having psychotic thinking...wanting to do evil things...it made me feel not good...I don't smoke it anymore"

"it makes me real paranoid...I smoked a big doobie. Nothing happened for a while. I walked down the street, then started feeling real sick, shaking, dizzy. My heart was pounding and I was freaking out. Then I felt that something bad was leaping out at me. I tried to escape, stumbled onto the road and was almost hit by a car"



Management

- | | |
|---|---|
| <ul style="list-style-type: none"> • Decontamination <ul style="list-style-type: none"> • GI <ul style="list-style-type: none"> • Limited value • Benzodiazepines <ul style="list-style-type: none"> • Agitation • Seizures • UDS <ul style="list-style-type: none"> • Will be negative for THC | <ul style="list-style-type: none"> • Supportive Care <ul style="list-style-type: none"> • CK levels – beware rhabdo • EKG if chest pain • Fluids • Temperature control • Seizure precautions |
|---|---|

On November 24, 2010, the DEA announced that it would make JWH-018, JWH-073, JWH-200, CP-47,497 and cannabicyclohexanol illegal using emergency powers. The ban will make the sale and possession of synthetic cannabinoids illegal. The temporary ban, for at least a year, came into effect on March 1, 2011. (20-21)

Case 1 conclusion

- Patient received PO diazepam, and was admitted where his symptoms resolved
- He admitted to using something called "Blonde"

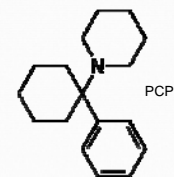


Case 2

- Two male patients present to ED after a Phish Concert. They both are highly agitated and altered. Both have heart rates greater than 120 b/m.
 - Patient 1
 - Becomes highly agitated and violent, and requires seven security guards to hold him down.
 - Patient 2
 - Not as agitated, but has periods of yelling, and has noticeable horizontal nystagmus.

Phencyclidine

- PCP
 - Initially used as a general anesthetic
 - 10-30% incidence of post-op psychosis & dysphoria
 - 1967: exclusive veterinary use
 - 1960s' and 70s' gained popularity as drug of abuse
 - 1970 ketamine introduced as anesthetic
 - ~ 5-10% the potency as PCP



Phencyclidine (22)

- Common names: angel dust, **embalming fluid**, sherms
 - Powder, liquid, tablets, leaf mixtures, rock crystal
 - **Mixed with THC: wet, fry, crystal joint, supergrass, embalming fluid**
 - Often referred to as "smoking wets"
- Onset of action
 - Highly Lipid Soluble - IV/ Inhalational: 2 - 5 minutes
- Duration of activity
 - Acute toxicity: 4 - 6 hours
 - Resolution: 24 - 48 hours
- UDS: metabolites may be present seven days after exposure

How does it work?

- Not completely understood (22)
 - Block NMDA receptors in cortex and limbic structures
 - May be contributory to PCP induced psychosis
 - Antagonize amine re-uptake complexes
 - Sympathomimetic
 - Psychomotor agitation
 - Also said to bind nicotinic, opioid, and muscarinic receptors

Clinical Manifestations (22-23)

- *Superhuman strength*
- *Horizontal, Vertical, Rotary nystagmus*
- Ataxia/ Altered gait
- Dysarthria
- Miosis
- Myoclonus, dystonia, hypertonia
 - Usually not apparent unless unconscious



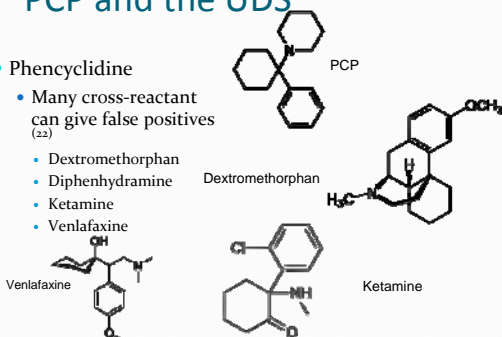
Management

- Supportive care
 - Temperature
 - CK levels
- Psychobehavioral symptoms
 - Quiet, non-stimulating environment
- Psychomotor symptoms
 - Physical/ chemical restraints
 - Benzodiazepines to effect



PCP and the UDS

- Phencyclidine
 - Many cross-reactant can give false positives (23)
- Dextromethorphan
- Diphenhydramine
- Ketamine
- Venlafaxine



ABC NEWS App for iPad: your world, in your hands. Available on the App Store.

THE NFL RECIPE SHOWDOWN //

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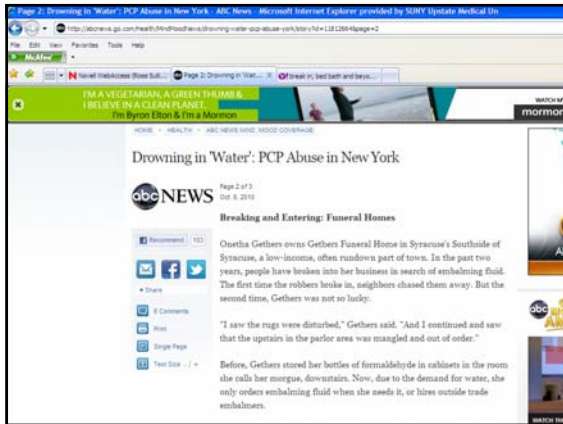
HOME HEALTH Dr. Richard Beaser | Alzheimer's | Arthritis | Diabetes | Men's Health | Women's Health | Pain Management | Sleep | Wellness | Global Health | Search

President Reduces Amount Homeowners Owe

Drowning in Water: PCP Abuse in New York

By MARLENE GARTHEZ Oct 6, 2010

It was a late spring night in Syracuse, N.Y., when Eric Bacon decided to go on a bar ride with some friends. Rolling the windows down, blasting up



Case 2 conclusion

- Both patients required high doses of benzodiazepines
 - Patient 1 received nearly 200mg IV diazepam
 - Patient 2 received 180mg IV diazepam
 - Depleted Emergency Room supply
 - Tachycardia resolved
 - Both patients did well overnight and discharged without sequelae

Case #3

- A 35 year old Cornell graduate student was overheard by neighbors screaming and called the campus police when they heard his apartment being “trashed” shortly thereafter
 - The police found a man with a bloody face
 - His apartment was in disarray with broken walls and overturned furniture
 - EMS was called, and the patient had a seizure for which he was given midazolam
- In the ED, the patient was highly agitated, but not violent
 - HR = 150

Legal Highs


- Type of Legal High ⁽¹⁻¹⁵⁾
 - Neither
 - Controlled by governmental acts/policies
 - Licensed for legal use
 - Legal to possess and supply
 - Not sold for human consumption
 - Mixed with plant extracts or synthetic chemicals
 - Sold via internet or Head shops
 - “bath salts”
 - “research chemicals”
 - “plant food”
 - “hoover freshener”
 - “for botanical research”

Bath Salts

- Generic Term
 - Collective group of agents
 - Local tobacco shops
 - Truck stops
 - Mini-marts
 - Internet
- Surge in use since November 2010
 - NPDS Data:
 - ~1500 exposures reported nationally since 9/10
 - >1,100 exposures since Jan 2011

Bath Salts

- Names ⁽¹⁰⁾
 - Ivory Wave
 - Dusted
 - White Lightning
 - Hurricane Charlie
 - Scarface
 - Red Dove
 - White Dove
 - Cloud 9





Bath Salts

- Cathinones
 - Constituent of the Khat plant
 - Leaves chewed for stimulant effect
 - Flowering plant native to tropical East Africa and the Arabian Peninsula.
- Synthetic Cathinones
 - Common Ingredients ^(1,15)
 - Mephedrone (4-methylmethcathinone)
 - Meow-Meow
 - Bubbles
 - MDPV (3,4 methylenedioxypropylvalerone)
 - Methylone (3,4- methylenedioxy-methcathinone)



Pharmacology

- Structurally Similar
 - Amphetamines
 - CNS stimulant
 - Peripheral Stimulant
 - Increasing release and inhibition of neurotransmitters ⁽⁶⁾
 - Norepinephrine
 - Dopamine
 - Serotonin



Structures

Phenylethylamine

Mephedrone

MDPV

Methylone

Formulations and Routes ⁽¹⁰⁾

- Most are powder
 - Insufflation
 - Onset within minutes
 - Peak < 30 min
 - Rapid decline
 - Ingestion
 - Longer onset of action
 - Rectal
 - IV
 - Has been combined with heroin
- Dose
 - Mephedrone
 - 90 mg
 - MDPV
 - 5 mg



Clinical Manifestations ⁽¹²⁾

- Symptoms
 - Agitation (53.3%)
 - Tachycardia (40%)
 - Hypertension (20%)
 - Seizures (20%)
 - Palpitations (13.3%)
 - Hallucinations/delusions
 - Suicidal ideation
 - Symptoms persisted for
 - more than 24h in 45%
 - More than 48h in 30% of cases

Prolonged Symptoms?

- The Times-Picayune
 - 21 yo male used Cloud 9
 - For several days he had paranoid delusions of the police coming to arrest and shoot him
 - Took a butcher knife and cut his throat
 - Was stitched and sent home
 - A day later, was found dead with a self inflicted **gun shot wound**
 - WNDU – Indiana
 - 36 yo M, father
 - 2 months of abusing bath salts
 - Believed to have gotten from mini-marts
 - Lost 50 lbs
 - Had a fixed delusion that the FBI was after him
 - Killed himself by vehicle carbon monoxide
- 46% of bath salt abusers had hx of mental illness (bipolar, schizophrenia, or depression ⁽¹²⁾)

Management

- Decontamination
 - GI
 - Limited value
 - Unless taken orally
 - Non-water soluble jelly
 - For insufflation
- Benzodiazepines
 - Agitation
 - Seizures
- Supportive Care
 - CK levels – beware rhabdo
 - EKG if chest pain
 - Fluids
 - Temperature control
 - Seizure precautions

Legal Status

- May 23rd, 2011
 - NY State banned: mephedrone and 3,4-methylenedioxypropylvalerone (MDPV)
- July 15, 2011
 - Cuomo signed bill to ban “bath salts”
 - Use
 - Possession
 - Sale
 - Marketing
 - Production

Case 3 conclusion

- Lab work
 - CK = 156,000 IU/L
 - + Urine myoglobin
- Alkalinization with bicarbonate
- Fractured nasal bones
- Received benzodiazepines for agitation
- Patient eventually felt better
- Pulse decreased to 100 b/m
- He admitted to using bath salts and remembered a face in his wall (hallucination?) telling him to smash his head into everything in his apartment

Case 4

- 17 year old girl was partying all night
 - Next morning she was found unresponsive behind her parents' couch
 - Patient had seizures in ED
 - Uncontrolled with IV benzodiazepines
 - Intubated, sedated with propofol



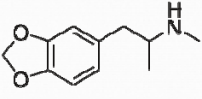
Molly

- Recreational use
 - First reported in California in 1990's
 - Since 2004, widely used
 - Piperazines, as well as many other drugs
 - Sold as ⁽²⁵⁾
 - “Purest ecstasy”
 - Charge
 - Bliss
 - Mash

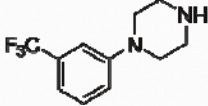


Molly

- Traditionally marketed as "Purest Ecstasy"



MDMA



















TFMPPP

Piperazines

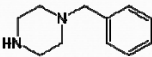
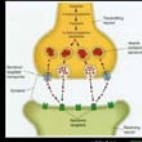
- Molly -TFMPP (1,3 Trifluoromethylphenyl piperazine)
- Other piperazines
 - Not closely related to any familiar recreational drugs
 - No examples found in nature
 - Fully synthetic
 - Developed as anti-helminthic in 1950s
 - Evaluated as anti-depressant in 1970s
 - Terminated shortly thereafter

EcstasyData.org: Lab Test Results for Recreational Drugs - Microsoft Internet Explorer, provided by SUNY Upstate Medical University

Lab Test Results for Recreational D...	Substance	Count	Start Date	End Date	Location	Dose	Reference
	MDMA	1	Oct 01, 2011	Oct 01, 2011	Waco, TX	100 mg, 9.1 x 9.0	EcstasyData.org
	MDMA	20	Oct 01, 2011	Oct 01, 2011	San Jose, CA	200 mg, 9.5 x 4.8	EcstasyData.org
	Methamphetamine	2					
	Caffeine	1					
	Methamphetamine	1	Sep 07, 2011	Sep 07, 2011	Toronto, ON, Canada	272 mg, 19.0 x 8.8	EcstasyData.org
	Propylene Glycol	1					
	MDMA	6,8					
	Caffeine	1	Sep 07, 2011	Sep 07, 2011	Toronto, ON, Canada	101 mg, 7.5 x 7.2	EcstasyData.org
	MDMA	20	Sep 07, 2011	Sep 07, 2011	Falmouth, CA	140 mg, -	EcstasyData.org
	Methylphenidate	1					
	Lisdex	1	Sep 07, 2011	Sep 07, 2011	Palm Springs, CA	200 mg, 8.0 x 5.0	EcstasyData.org
	MDMA	1					
	MDMA	3	Sep 07, 2011	Sep 07, 2011	Boston, MA	200 mg, 8.8 x 5.8	EcstasyData.org
	BZP	1					
	Caffeine	1					
	Methylone	1	Sep 07, 2011	Sep 07, 2011	Los Angeles, CA	270 mg, 9.2 x 5.2	EcstasyData.org

Pharmacology

- TFMPP ⁽¹⁵⁾
 - Post synaptic serotonin agonist
 - Pre-synaptic serotonin release
 - Inhibition of re-uptake inhibitor
 - Little to no affect at dopamine and noradrenaline transport ⁽¹⁵⁾
 - Sometimes combined with BZP ⁽²⁵⁾(benzylpiperazine)
 - Amphetamine like properties ⁽¹⁵⁾
- TFMPP + BZP
 - MDMA affect?


Symptoms - Molly

- If TFMPP
 - Serotonergic Toxicity
 - Nausea
 - Migraines
 - Anxiety attacks
 - Serotonin syndrome
 - Seizure
 - Hyponatremia
 - If TFMPP + BZP
 - Agitation
 - Anxiety
 - Hallucinations
 - Vomiting
 - Insomnia

- Ecstasy ⁽²⁶⁾
 - Entactogen
 - A strong sense of inner
 - Diminished aggression, hostility, and jealousy
 - Diminished fear
 - euphoria
 - Feelings of intimacy and love for others
 - An intensification of all of the bodily senses (hearing, touch, smell, vision, taste)

Treatment

- Symptomatic
- Benzodiazepines
 - Agitation
 - Anxiety
- Consider serotonin syndrome
- Pay close attention to electrolytes
- Bottom line
 - Conflicting reports as to what it actually contains!
 - Treat the patient

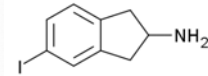


Case 4 conclusion

- Serum sodium was 115 mEq/L
- Patient was intubated for almost a week
- Complications included aspiration pneumonia
- Further intermittent seizure activity
- Several episodes hemodynamic instability
- Finally extubated
- Eventually discharged home
- Anoxic brain injury
 - Difficulties with activities of daily living

Even Newer Drugs of Abuse!?

- The Upstate PCC
 - Received a call
 - 20 year old female who used "Pond Cleaner" or "Pond Scum" for several days in a row
 - Last ingestion was 3 days ago
 - She presents with shakiness, confusion, and ataxia
- 5-Iodo-2-aminoindane (5-IAI)



- Little information available
- Thought to be agonists of dopamine and act similarly to amphetamine⁽¹⁵⁾

Conclusion

- Drug abuse remains a significant public health concern
- The "old" drugs of abuse are still very popular
- But the "new kids on the block" are emerging as dangerous alternatives



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