



Drugs of Abuse: What's Hot, What's Not

Recreational drug users are becoming more creative each year, and they often present to the emergency department when their pharmacology goes awry. The lecturer will discuss current trends in drugs of abuse (e.g., heroin, cocaine, methamphetamine, GHB) and newer ways of using these drugs. The recognition and treatment of such exposures will be discussed.

- Identify the latest drugs of abuse.
- Identify the signs and symptoms of intoxication from designer drugs and from “old favorites.”
- Develop a rational approach to the management of patients intoxicated with these drugs by using the latest information from recent studies.

MO-05
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FACULTY

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DRUGS OF ABUSE: WHAT'S HOT WHAT'S NOT

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ACEP Scientific Assembly

CASE #1 THE PASSION PIT AND THE PINPOINT PUPIL

HISTORY

A 25 year old male is found unresponsive by paramedics at an inner city night club called "The Passion Pit" and brought to your emergency department. An IV line of normal saline was established in the field prior to arrival.

PHYSICAL EXAM

General: Dishevelled appearance, breathing spontaneously but shallow, responding only to painful stimuli.
Vitals: P= 56 RR=6 BP= 110/70 T=95.8
Head: Normocephalic/atraumatic
Eyes: Pupils pinpoint, 1-2mm
ENT: TM's normal; no bleeding from nose or mouth
no gag reflex appreciated.
Neck: Supple
Lungs: Clear to auscultation and percussion
Heart: RRR S1S2, no murmurs
Abd: Soft with hypoactive BS
Rectal: Normal tone (-)Heme
GU: Ice cubes placed on groin by friends at nightclub
Neuro: Moves all 4 exts, responds to painful stimuli
Skin: Cool, dry, (+)needle tracks noted along the upper exts

QUESTIONS and CONTROVERSIAL ISSUES

I) **What is the differential diagnosis of a patient with pinpoint (miotic) pupils?**

C = Cholinergic drugs, clonidine
O= Opiates, Organophosphates
P= Phenthiazines, pilocarpine, pontine bleed
S= Sedative hypnotics

II) **What members of the "Coma Cocktail" should be administered to this patient?**

A) 50% Dextrose
1) Efficacious if patient is hypoglycemic
2) Theoretic exacerbation of cerebral ischemia

- 3) Check chemstick prior to administration.
- B) Thiamine
- 1) Indicated in alcoholic, malnourished patients.
 - 2) Avoid precipitation of Wernicke's encephalopathy?
- C) Naloxone
- 1) Indicated in comatose patients with suspected drug overdose
 - 2) Initial dose of 2mg IVP (restrain patient prior to administration since can precipitate withdrawal)
 - 3) May require doses up to 10mg with longer acting opioids and higher grades of heroin
 - 4) Short half life (20-30 minutes)
 - 5) Naloxone drip if repeat boluses required

CLINICAL COURSE

After administration of 2mg of naloxone, the patient becomes more alert and begins to verbalize with spontaneous respiratory activity. His vital signs are stable with normal sinus rhythm noted on the monitor. Laboratory data including ECG and CXR are unremarkable. The toxicology screen is positive for opiates. The patient denies suicidal ideations and admits to frequent abuse of IV heroin claiming he "just had a bad cut tonight." He becomes more uncooperative and demands to be discharged.

III) **Should this patient receive a longer acting opioid antagonist?**

- A) Nalmefene: opioid antagonist with 6 hour half life
- B) May be efficacious in patients requiring a naloxone drip
- C) Documentation in the emergency medicine literature limited
- D) Unclear whether indicated, efficacious or safe in narcotic users being discharged from the ED.

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CASE #2 LOOK AT THE SIZE OF THOSE ST SEGMENTS!

HISTORY

The patient is a 28 year old male who presents in police custody complaining of chest pain.
He has no previous cardiac disease history.

PHYSICAL EXAM

General: Patient is very agitated, clutching his chest

Vitals: P= 140 BP=220/130 RR= 28 T= 103.2
Eyes: Pupils equal: 7mm; EOMI
Lungs: CTA
Ht: RRR S1S2, +2/6 systolic murmur
Abd: Soft nontender, (+)BS
Ext: Good pulses, no cyanosis, no needle tracks
Neuro: No focal defs
Skin: Diaphoretic

ECG: Sinus tachycardia, large 5mm ST segment elevations in anterior leads.
Unifocal PVCs on monitor.

CLINICAL COURSE

The patient now admits to swallowing several "dime bags" of cocaine approximately 3 hours prior to presentation when the police raided his house.

QUESTIONS AND CONTROVERSIAL ISSUES

I) **Describe the difference between a "Body packer" and "Body stuffer"**

- A) *Body packers* are drug smugglers who ingest illegal contraband methodically wrapped in multilayered condoms or latex in order to deliver the goods across international borders once safely through customs.
- B) *Body stuffers* are those individuals who suddenly "swallow the evidence" during drug raids in carelessly wrapped single layered baggies, aluminum foil, or ziplock bags when about to be incarcerated by the authorities. Due to the faulty wrapping technique, despite less purity of the drug ingested, body stuffers are often more vulnerable to life-threatening toxicities secondary to leakage.

II) **How should this patient's cocaine-associated chest pain and hypertension be treated?**

- A) Benzodiazepines- First line therapy (in high doses)
- B) Nitroglycerin- for control of ischemic pain and HTN
- C) Labetalol- alpha/beta blocker (the use of propranolol will leave the alpha portion unopposed theoretically exacerbating cocaine's toxicity).
In theory labetalol makes sense, but clinically, much more beta blockade than alpha.
- D) Phentolamine- alpha blocker
- E) Nitroprusside- for refractory HTN
- F) Calcium channel blockers- controversial.

III) **What would be the best mode of gastric decontamination in this setting?**

- A) Syrup of ipecac- contraindicated, patient unstable and potential for cocaine-induced seizure activity.
- B) Gastric lavage- not very efficacious (3 hrs post ingestion); low return of cocaine packets due to size of lavage tube; may rupture bags in process
- C) Activated charcoal- may adsorb leaking cocaine in gut
- D) Whole bowel irrigation- (PEG solution) 1-2L/hr
Rapid, efficacious, osmotically/electrolyte-safe

IV) **Is there a role for thrombolytics in patient's with cocaine-induced myocardial ischemia?**

- A) Mechanisms of cocaine-induced myocardial ischemia
 - 1) Coronary vasospasm
 - 2) Accelerated atherogenesis
 - 3) Thrombotic plaque formation
- B) Consider thrombolytics if strict ECG criteria are met.
(Caution, this younger patient population will often demonstrate false positive ECG readings due to "early repolarization" and ventricular hypertrophy.)
- C) In a recent case series, the complication rate of thrombolytics was low. However, cocaine patients are prone to hypertensive, intracranial bleeds, thus, *liberal* use of thrombolytics is discouraged.
- D) At present, the use of thrombolytics in these patients remains controversial.

V) **What consultations should be requested?**

- A) Cardiology- Unstable patient with acute anterior wall MI; consideration of thrombolytics.
- B) Surgery- Patient ingested potentially lethal dose of cocaine packets, consult for emergent exploratory laparotomy to remove the source of toxicity.
- C) Toxicology service or Poison Control Center
- D) Radiology- Abdominal CAT scan or contrast studies

VI) **Should all patients with cocaine-induced chest pain be admitted?**

- A) Overall mortality rate from cocaine-associated chest pain is low
- B) Not all chest pain in cocaine abusers is cardiac-related

- (eg- PTX, pneumomediastinum, septic emboli)
- C) Some authors recommend admitting all patients with cocaine induced chest pain to a monitored setting to R/O myocardial ischemia
 - D) Others are less conservative and send the majority of these patients home after a brief observation period.
 - E) Compromise- maintain a high index of suspicion, take a detailed cardiac history (respecting cocaine abuse as a legitimate cardiac risk factor), monitor the patient, and carefully interpret the ECG.

CLINICAL COURSE

The patient's chest pain and hypertension eventually resolves with large doses of nitroglycerin and benzodiazepines. The patient is administered activated charcoal and polyethylene glycol solution by the ED physician. Because of the ST segment elevations, the cardiologist elects to give thrombolytics. However, since thrombolytics were "on board" the general surgeon refuses to take the patient to the OR for exploratory laparotomy and removal of the cocaine packets. The patient subsequently develops generalized seizure activity, worsening hyperthermia, rhabdomyolysis, and intracranial hemorrhage. He expires 48 hours after admission.

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CASE #3 THE FRESHMEN RAVE PARTY

HISTORY

The patient is a 19 y/o female who presents after “dancing nonstop at a rave party”. The patient is a normally healthy college freshman who is unable to give a history due to her agitated state. Her friends claim that there was a lot of “Ecstasy and Crank” circulating at the party.

PHYSICAL EXAM

Gen: The patient is severely agitated thrashing all over the gurney.
Vitals: BP=180/100 P=128 RR=32 T=106.4⁰F
Head: NC/AT
Eyes: Pupils 6mm each
Neck: Stiff
Lungs: CTA
CV: Tachy RRR S1S2 no m's
GI: Soft, hyperactive BS, no masses
Ext: Bounding periph pulses, no cyanosis, no needle tracks
Neuro: Moves all 4 exts appropriately, but rigid, no obvious defs
Skin: Hot, flushed and diaphoretic

LABORATORY

CBC: WBC=22K Hgb=16.5 PLT=201K
Lytes: Na=165 K=6.9 Cl=112 HCO₃=17
BUN/Cr: 42/0.8 Glucose: 224
U/A: 2 WBC; 0 RBC; Large blood
CPK: 3,300
Tox Screen: Pending

DIAGNOSTIC / THERAPEUTIC ISSUES

- I) What is the optimal way to rapidly cool this patient?
- A) Mist/spray and fans
 - B) Strategic ice placement
 - C) Dantrolene: Controversial
 - D) Avoid excessive antipyretic therapy
- II) What are the most commonly abused designer amphetamines?
- A) Ecstasy / MDMA (3,4 Methylenedioxymethylamphetamine)
 - B) MDA / Adam (3,4 Methylenedioxyamphetamine)
 - C) MDEA / Eve (3,4methylenedioxy-N-ethylamphetamine)
 - D) Crystal Meth "Crank" & Ice (Methamphetamine hydrochloride)
 - E) Metcathionine ("CAT")
- III) What other therapeutic interventions are indicated?
- A) Treat rhabdomyolysis with alkalinization / diuresis (avoid acidification)
 - B) Seizure precautions (benzodiazepines)
 - C) Watch for *hyponatremia* if prior excessive water intake by patient
 - D) Activated charcoal if recent oral ingestion

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CASE #4 THE TEENAGE PAINTER

HISTORY

The patient is a 16 year old male who presents to the ED complaining of facial swelling, drooling, and blisters on his fingers after "doing a little painting". The patient also claims that the top of a Freon propellant can "fell off" while he was sleeping next to it.

PHYSICAL EXAM

General: Alert, oriented in mild respiratory distress

Vitals: P=120 RR=28 BP=110/60 T=96

HEENT: Extensive edema, scattered blisters and bullae of the lips, oral mucosa, and tongue with obvious facial deformity. Drooling but no stridor.

Lungs: CTA CV: Tachy RRR S1S2 no murmurs

GI: Soft nontender, no masses

Ext: Blisters noted on three of the right distal phalanges

Neuro: Motor/sensory intact, no focal defs

LABORATORY

CBC: WBC= 20.2K Hgb=11.5

Lytes: Na= 140 K=2.9 Cl=117 HCO3=18

BUN/Cr: 29/2.1 Glucose= 140

Tox screen: (+) cannabinoids ETOH: 20
ECG: Sinus tach 120/min, no ischemia, NL QRS
CXR: No evidence of infiltrate or edema

DIAGNOSTIC AND THERAPEUTIC ISSUES

- 1) What are the commonly abused inhalants or solvents?
 - A) Glue sniffing, huffing, and bagging
 - B) Spray paints / Scotch guards with toluene
 - C) Butane / Propane
 - D) Nitrous oxide (“whip-its”, “laughing gas”)
 - E) Type writer correction fluid (TCE)
 - F) Gasoline / Hydrocarbons
 - G) Trichlorofluoromethane (Freon, Halon)
 - F) Amyl nitrite (“poppers”)

- 2) What are the toxic effects of the inhalants or volatile substances?
 - A) Transient euphoria
 - B) Cardiac sensitization: secondary to endogenous catecholamines
 - C) Sudden death reported
 - D) Pulmonary edema / Chemical pneumonitis
 - D) Renal damage (distal RTA)
 - E) Metabolic acidosis (with elevated and nonelevated anion gap)
 - F) Neuropsychiatric deficits / cognitive impairments

- 3) What are necessary therapeutic interventions?
 - A) Assess respiratory status
 - B) Cardiac monitoring
 - 1) Avoid excessive use of epinephrine (may exacerbate cardiotoxicity)
 - 2) PSVT: Adenosine
 - 3) V Tach: Lidocaine or countershock
 - 4) Beta blockers for tachydysrhythmias: controversial
 - C) Decontaminate skin
 - D) Assess renal function
 - E) Neurobehavioral testing if chronic use
 - F) Detoxification and family counseling

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CASE #5 THE SEIZING BODY BUILDER

HISTORY

The patient is a 23 y/o male who suffered a witnessed seizure, and is brought to the ED comatose, by concerned friends. The friends deny previous seizure disorder or history of drug abuse.

PHYSICAL EXAM

Gen: Comatose, postictal, well developed, muscular
Vitals: BP= 150/90 P=64 RR=20 T=98.7
HEENT: NC/AT PERRL 4mm Neck: supple (+)gag reflex
Lungs: CTA
Ht: RRR S1S2 no m's
Abd: Soft nontender (+)BS
Ext: Good periph pulses, no needle tracks, no cyanosis
Neuro: Moves all 4 exts to pain, no focal defs
Skin: Cool, diaphoretic

MANAGEMENT

The patient is placed on oxygen and a cardiac monitor
IV established
D50 and naloxone administered without response

LABORATORY

WBC= 14.5 H/H=13/39
Na= 140 K= 4.2 Cl= 105 HCO₃= 19
Glucose= 180 BUN/Cr: 10/0.9
ABG: pH=7.35 PO₂=110 PCO₂= 36

Tox screen: Negative
ECG: NSR, no ectopy, no ischemia, normal QRS
CT Head: No bleed or mass

DIAGNOSTIC / THERAPEUTIC INTERVENTIONS

- 1) What is the differential diagnosis for a patient presenting with toxic seizures?
- 2) In general, what is the best way to manage refractory toxic seizures?

CLINICAL COURSE

4 hours after the ED presentation, the patient more alert oriented. He admits to taking 1 tablespoon of "growth hormone powder" mixed with water 45 minutes prior to presentation, purchased from a health food store. The powder had been advertised as a "muscle builder".

A young adult patient presenting with new onset seizures can be a diagnostic dilemma. The differential for toxic seizures can be summarized by the following mnemonic:

O=	Organophosphates	C=	Cocaine, Camphor
T=	TCA's	A=	Amphetamines
I=	INH, Insulin	M=	Methyl xanthines (theophylline)
S=	Salicylates	P=	PCP
		B=	B-Blockers, Benzo withdrawal, Botanicals
		E=	Ethanol withdrawal
		L=	Lead, Lithium
		L=	Lidocaine, Lindane

In general, the optimal way to manage refractory toxic seizures begins with high dose benzodiazepines. The second drug of choice would be phenobarbital. Phenytoin, while classically used for treatment of seizures has little effect if the seizure is toxin induced. Pyridoxine (Vitamin B6) should be given if INH toxicity is suspected. Last step in treatment would include paralyzing the patient with short acting agents.

CLINICAL COURSE

The patient admitted to taking "growth hormone powder" 45 minutes prior to presentation. The powder had been advertised as a "muscle builder" called G.H.B. Gamma hydroxybuterate was originally developed as an anesthetic agent in the 1960's. It was never highly marketed secondary to induction of seizure activity and lack of analgesia. Recently, the drug has gained popularity in the health food market as a supplement for body builders with claims of anabolic effects by stimulating growth

hormone. Street names include: Gamma-Oh, Gama hydrate, Somatomax, Liquid G, Cow Growth Hormone, and Bioski. The word on the street is that it can give great euphoric effects (not true). It is popular among body builders, actors and artists. GHB is illegal for OTC sales in most states. It has also gained media attention as the latest “date-rape” drug, second only to the potent benzodiazepine Rohypnol (Flunitrazepam).

Optimal treatment for GHB toxicity includes recognition, supportive care, controlling seizures with benzodiazepines, and maintenance of the patient’s airway. There is no known antidote for GHB toxicity.

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CASE #6 THE VIOLENT PREGNANT PATIENT

HISTORY

The patient is a 22 year old female on parole who is pulled over by state troopers along the interstate highway for speeding. Upon questioning, she becomes belligerent, combative and is taken to the local police station.

While at the police station, she has an acute change in mental status, first becoming confused, agitated, then lethargic. She is brought to the closest inner city ED for medical evaluation.

PHYSICAL EXAM

Gen: The patient is writhing in bed and mumbling incoherently
V's: P=130 BP=160/80 RR=22 T=99.9
HEENT: 4mm pupils with prominent rotary nystagmus
Lungs: CTA
CV: Tachy RRR S1S2 +2/6 syst murmur
Abd: Soft, gravid uterus palpated at the level of the umbilicus

LABORATORY DATA

CBC: WBC=16 Hgb=12.3
Lytes: Na=142 K=4.0 Cl=109 HCO3=20
BUN/Cr: 10/0.5
Glucose: 110
Tox Screen: Negative
ECG: Sinus tach without ischemia/ectopy
Urine Preg: Positive

DIAGNOSTIC / THERAPEUTIC ISSUES

- 1) What is the differential diagnosis of nystagmus?
- 2) What other diagnostic studies should be obtained?
- 3) Does the fact this patient is pregnant alter your management?

CLINICAL COURSE

The violently toxic patient is always an interesting challenge to the entire medical staff. This case is unique in that it involves a young pregnant female. One valuable diagnostic clue on physical exam was the finding of nystagmus. The differential diagnosis of nystagmus includes phenytoin, carbamazepine, PCP, toxic alcohols, ethanol and sedative hypnotics. Since this patient has altered mental status a thorough physical is essential, including a pelvic exam.

Pelvic examination revealed a 3 inch glass vial, which upon removal from the vaginal vault, filled the room with the smell of formaldehyde. The vial was 2/3rds full of a yellow volatile liquid. A stat bedside ultrasound revealed a live IUP. The tox screen, which was initially negative, was repeated two hours later and returned positive for PCP. The liquid from the vial also tested positive for PCP. The patient's mental status and vitals returned to baseline in 12 hours. She admitted to "doing wicki sticks" while driving and stuffed the vial up her vagina when pulled over by the police.

Body stuffing to avoid police detection is a well known phenomena. It is usually done in a hurried manner with poorly wrapped containers which may be prone to leaking. Wicki sticks are cigarettes (tobacco or marijuana) which are dipped in formaldehyde laced with PCP (street termed "embalming fluid"). More typical routes of exposure include intranasal, intravenous, inhalation and ingestion. Management of acute PCP overdose includes supportive care, sedation with benzodiazepines and haldol. Observe for hyperthermia and rhabdomyolysis and restrain when necessary to protect the patient and medical staff.

The anesthetic agent ketamine (AKA "Special K") is also on the rise as a current drug of abuse. Typically, the agent is snorted in powder form and can give signs and symptoms similar to PCP toxicity. It usually produces a negative drug screen.

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CASE #7 THE COMBATIVE STREAKER

HISTORY

The patient is a 22 year old male brought to the first aid station after running naked at a concert stadium featuring the Grateful Dead. He is noted to be "wild" and agitated and requires full leather restraints.

PHYSICAL

General: WDWN male, combative
Vitals: BP=130/80 P=122 RR=24 T=100.5
HEENT: Pupils 6mm and reactive
Ht: RRR S1S2, tachycardic
Lungs: CTA
Abd: Benign but difficult to examine
Ext: No needle tracks, moves all 4, no trauma
Neuro: Hyper-reflexic, no focal deficits
Skin: Flushed, "Dead Head" tattoo on L buttock complete with skull and lightning bolt

QUESTIONS and CONTROVERSIAL ISSUES

I) **What are some of the commonly abused drugs which may result in violent or combative behavior?**

- C= Cocaine
- O= Opiate withdrawal
- M= Mushrooms, Methaqualone
- B= Blotters (LSD)
- A= Amphetamines, Angel Dust (PCP)
- T= THC (Marijuana)
- I= Inhalants
- V= Volatiles, Violent drug crimes
- E= Ethanol

II) **What therapy should be instituted in this patient?**

- A) Protect medical staff from patient
- B) Dimly lit room
- C) Physical or leather restraints
- D) Chemical restraints
 - 1) Haloperidol
 - 2) Benzodiazepines (Lorezapam)
- E) Observe patient for seizures, hyperthermia, and rhabdomyolysis.

CLINICAL COURSE

The patient remains combative despite the use of physical restraints at the stadium's first aid station. He is transported to the nearest ED where his labs are WNL and toxicology screen is reported as negative with an ethanol level of 110. The patient is given 10mg of haloperidol X2 with adequate sedation.

When he awakes in the AM after an overnight observation, he confesses that he was actually one of the *doctors* scheduled to work the first aid station. However, he "got mixed-up with the crowd" prior to his shift and ingested several brown "magic shrooms" possibly laced with PCP. The patient recovers uneventfully.

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