



# Thug Drugs

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# Faculty

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- Coordinator, WV Pain Management Expert Panel (SEMP Guidelines)
- WV PDMP Advisory Panel Member
- CDC Grant Reviewer

# Disclosures

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- Consultant/Independent Contractor: Daiichi Sankyo, Clinical Pharmacists Advisory Panel, Member

This presentation was not a part of the presenter's official duties at the WVU and does not represent the opinion of WVU

# Learning Objectives

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- Recognize commonly abused substances across the globe.
- Classify commonly abused substances based on each substance's mechanism(s) of action.
- Explain how to provide guidance to the lay public on the anticipated effects of commonly abused substances.

COCAINE

AMPHETAMINES

HEROIN

Opioids

DAB

LACED HEROIN

GRAVEL

Russian Magic

NBOME

BATH SALTS

KROKODIL

PCP

KETAMINE

Live Cacti

LSD

Skittles

KHAT

Roboshake

SALVIA

METHAMPHETAMINE

MXE

# ILLCIT SUBSTANCES

DEXTROMETHORPHAN

ECSTASY

KRATOM

Magic Mushrooms

Scooby Snacks

Pharming Parties

Special K

Sizzurp

MARIJUANA

Purple Drank

Agent Orange

# What are *illicit* substances?

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## 1. Schedule 1 Controlled Substances

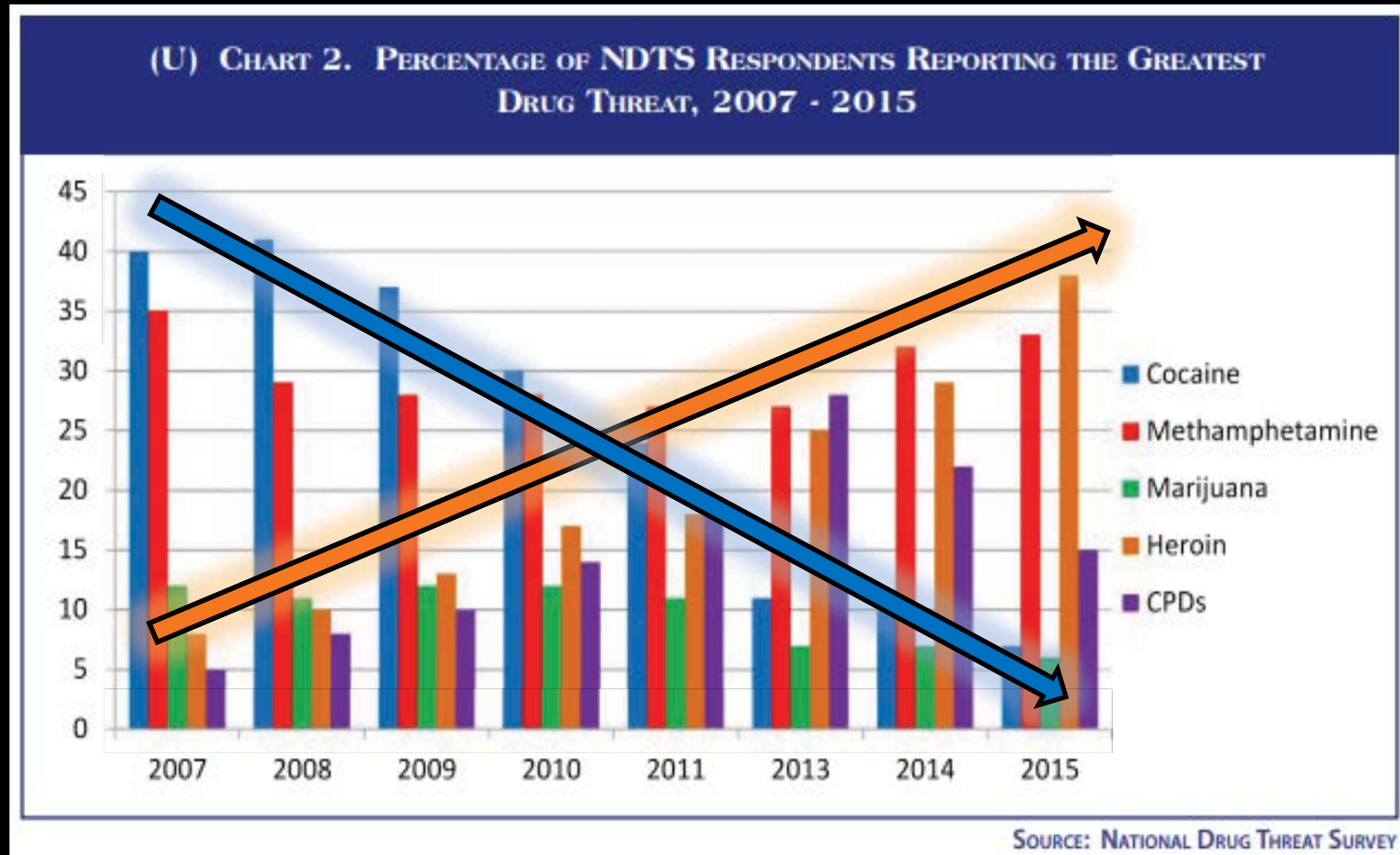
- Illegal to make, sell, or use
- No accepted medical use, dangerous, & potential severe dependence

## 2. Any Schedule Controlled Substance utilized for unintended people/uses

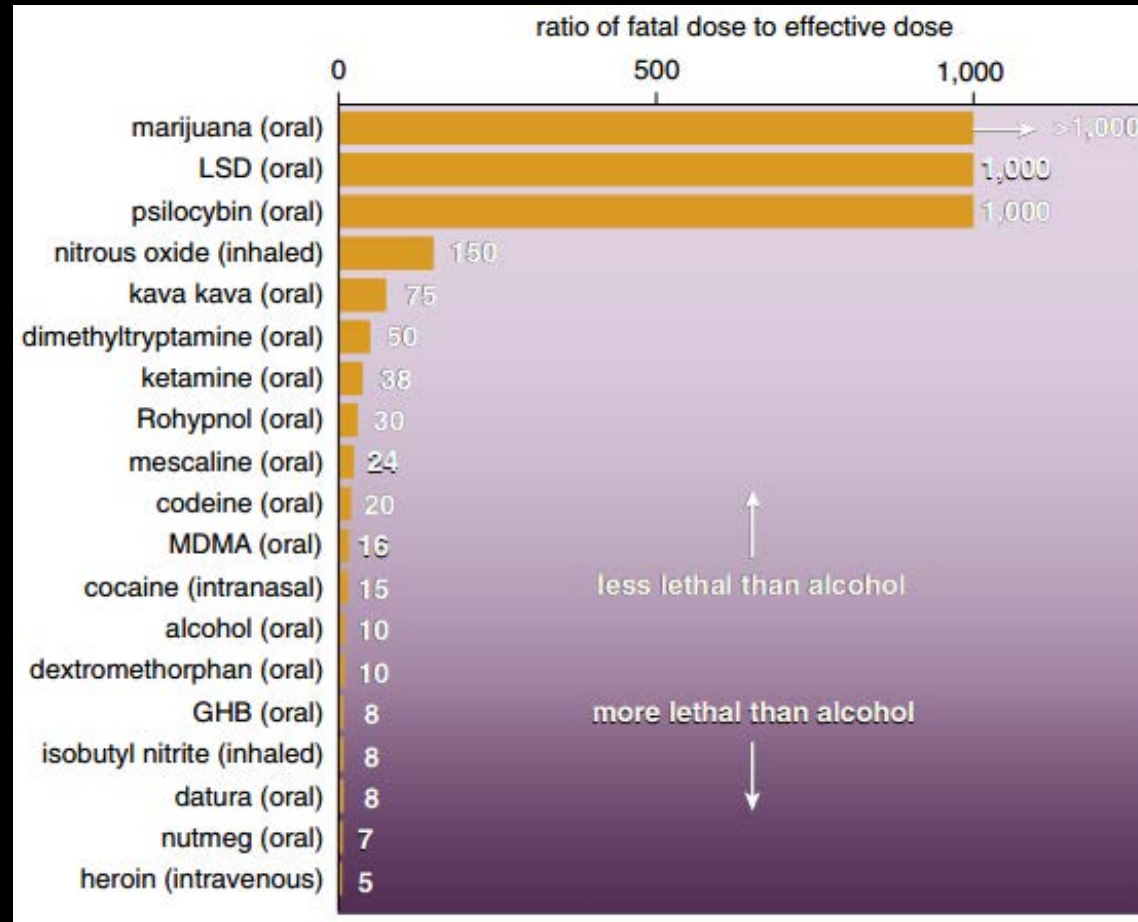
Laws are not uniform among states/countries

- Heroin is LEGAL in the UK, Portugal, Canada, etc.
- Marijuana is “LEGAL” in certain US states, yet Illegal on the Federal Level

# Most Abused Illicit Substances (2015)



# Illicit Therapeutic Index





# Word of Mouth

**www.streetrx.com**

Shows daily observed prices by location



**\$ Did you get a good deal?** Submissions are anonymous

\* Name of drug

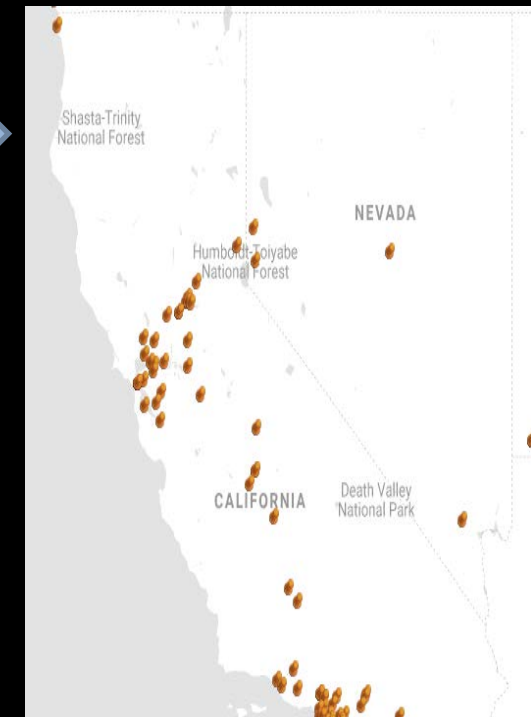
\* Formulation

\* Price per unit  
\$

Please choose a drug to see formulation options

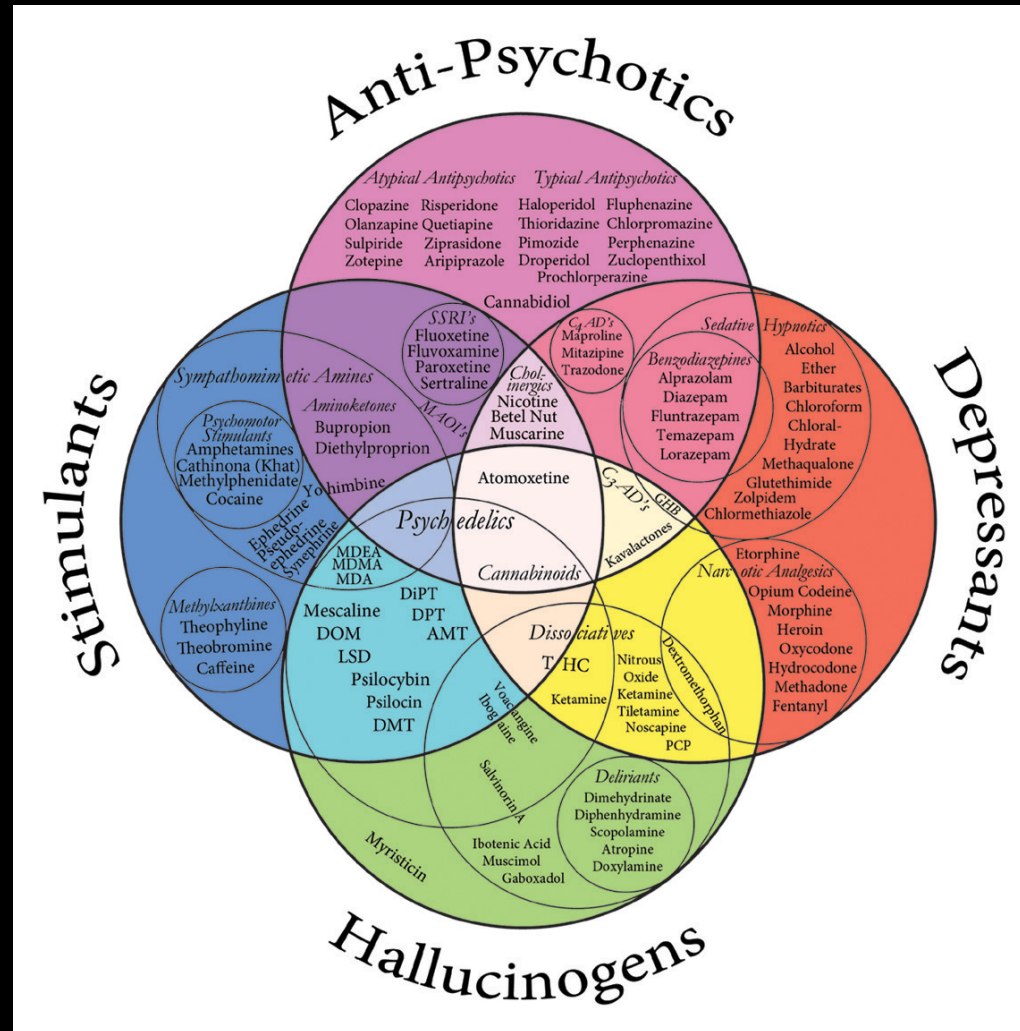
**Continue**

Nevada		
<b>\$8</b> May 31 2018	oxymorphone ER tablet (generic Opana ER), 10mg pill	Not Bad \$ \$ \$ \$ \$
<b>\$5</b> May 23 2018	oxycodone, 10mg pill	Reasonable \$ \$ \$ \$ \$
<b>\$14</b> May 22 2018	Adderall, 30mg pill	Not Bad \$ \$ \$ \$ \$
<b>\$12</b> May 22 2018	Adderall, 30mg pill	Reasonable \$ \$ \$ \$ \$



Resource for addiction treatment centers by zip code  
(Links to SAMHSA)

# Illicits de Venn



# Illicit Substances Overview

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## Hallucinogens

- NBOME
- LSD
- Ketamine
- MXE
- PCP
- Psychedelic Mushrooms
- Peyote Cacti
- Ecstasy

## Stimulants

- Cocaine
- Meth(amphetamine)
- KHAT
- Bath Salts & Gravel

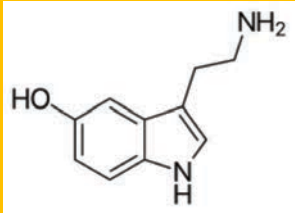
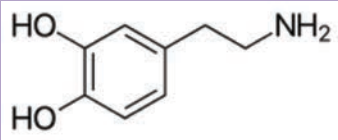
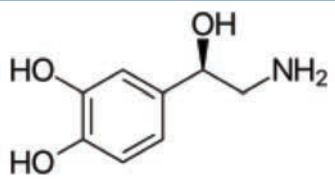
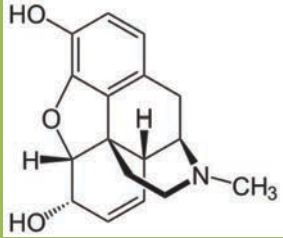
## Cannabis Products

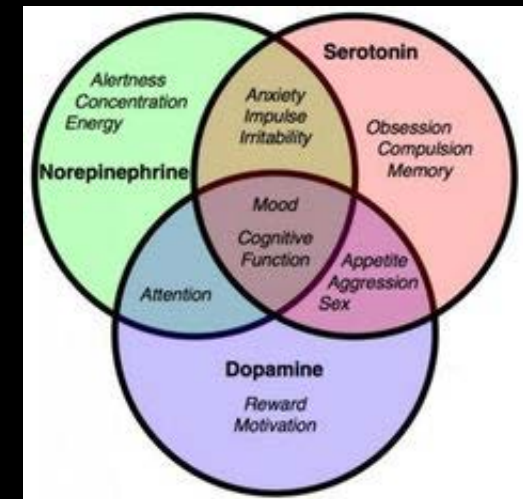
- Marijuana Plant
- Synthetic Marijuana
- Marijuana Extracts

## Opioid-Related Products

- Heroin
- Laced Heroin
- Krokodil
- Kratom
- Salvia
- Dextromethorphan
- Loperamide

# Increased Neurotransmitter Effects

	Serotonin (5HT)	Dopamine (DA)	Norepinephrine (NE)	Opioid
Effects	Hostility/Agitation Muscle Rigidity Shivering Goose Bumps Dilated Pupils Fever/Sweating Diarrhea Seizures Restlessness Tachycardia	“Reward & Pleasure” Schizophrenia Muscle Twitching Amnesia Insomnia Tachycardia	“Fight or Flight” Dilated Pupils Tachycardia Dry Mouth Urinary Retention	Constricted Pupils Confusion Nausea/Vomiting Constipation Dry Mouth Urinary Retention Respiratory Depression
Structures				 Morphine (Phenanthrene)



# HALLUCINOGENS

# Hallucinogens

NBOMe	1 <sup>st</sup> 5-HT-2A Receptor Agonist
LSD	Affects D/5HT/NE Receptors
Ketamine	<u>NMDA</u> Antagonist, <u>D</u> / <u>mu</u> / <u>K</u> agonist, <u>S</u> / <u>N</u> / <u>D</u> -RI, <u>Na</u> / <u>Ca</u> Channel Blockers, <u>NO</u> Synthase Inhibitor
MXE	NMDA Antagonist & SSRI (5HT)



# Hallucinogens

PCP	NMDA Antagonist, Anti-Cholinergic, & Dopamine
Psychedelic Mushrooms	5-HT <sub>1A</sub> and 5-HT <sub>2A</sub> and 5-HT <sub>2C</sub> Agonist
Peyote Cacti	5HT-2A Receptors & Dopamine
Ecstasy (MDMA)	5HT/DA/NE



# STIMULANTS



# Cocaine

## Nicknames

Coke, Speed, Snow, Blow, or Cocoa Puffs



## Mechanism

5HT/NE/D & Na-Channel Blocker



## Market

Snorted Powder "Lines" include: "**Bumps**" (35mg) or "**Rails**" (100mg)

Cocaine HCL + Baking Soda → Crack Dime Bags: \$10 for 1/10<sup>th</sup> Gram (Smoked)



# Stimulants

Meth(amphetamine)

NE & Dopamine



Khat

NE & Dopamine



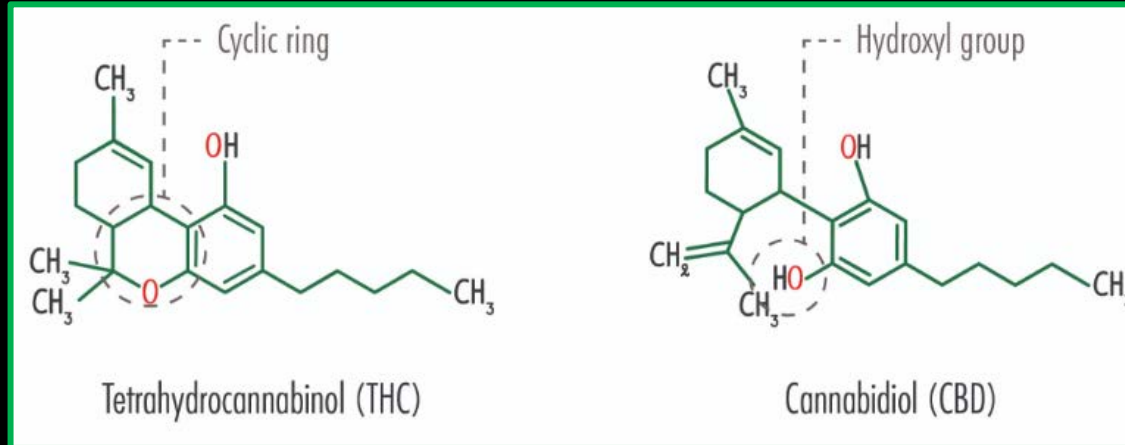
Bath Salts &  
Gravel

Synthetic Cathinones  
NE & Dopamine



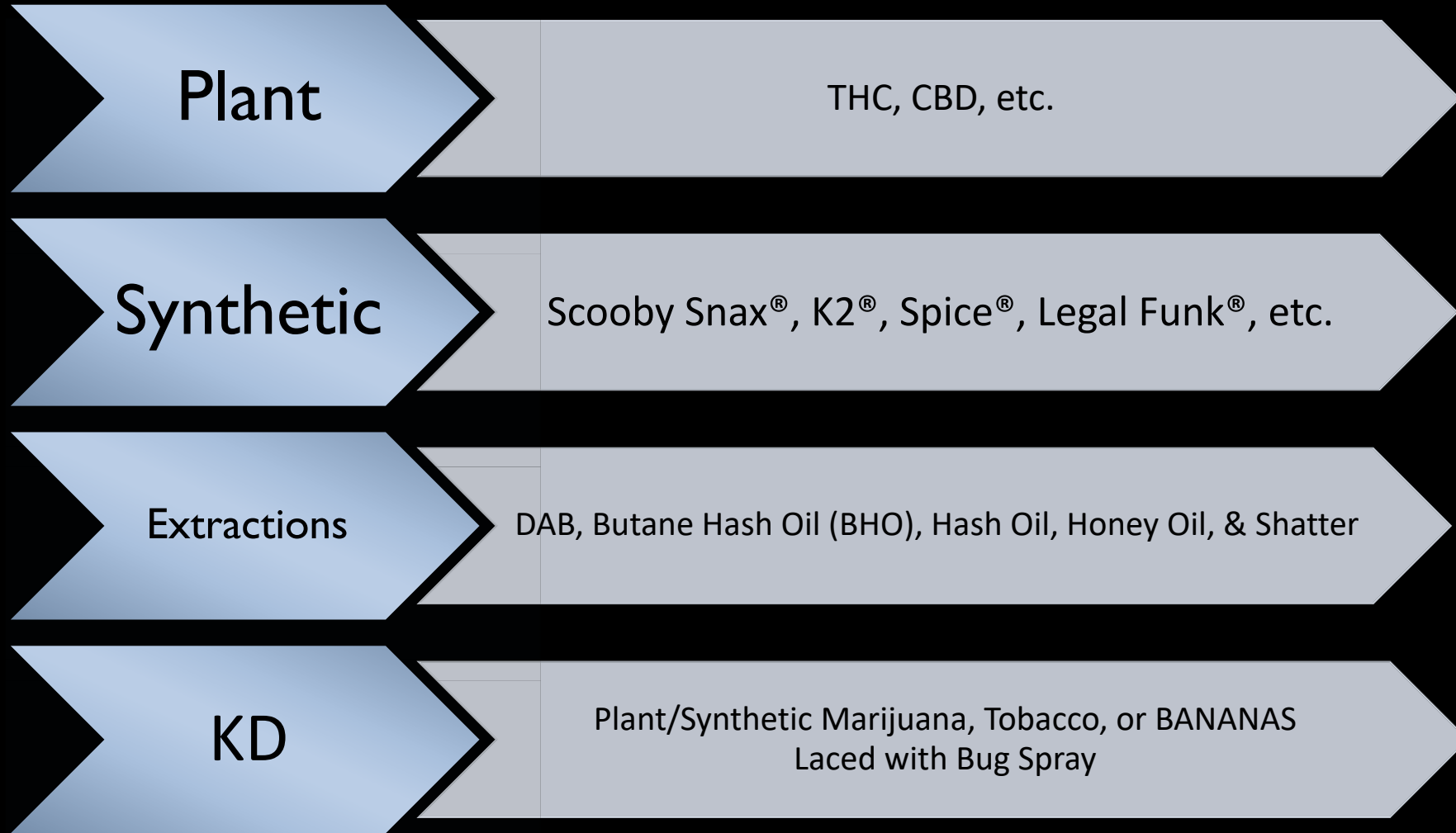
# Marijuana

# Let's Dive into the WEEDs...



THC	CBD
<ul style="list-style-type: none"><li>Pain</li><li>Nausea</li><li>Vomiting</li><li>Appetite</li><li>Glaucoma</li><li>Insomnia</li><li>Anxiety</li><li>Muscle Spasticity (Stiffness)</li></ul>	<ul style="list-style-type: none"><li>Pain</li><li>Inflammation</li><li>Seizures</li><li>Psychosis</li><li>Depression</li><li>IBS</li></ul>

# Marijuana



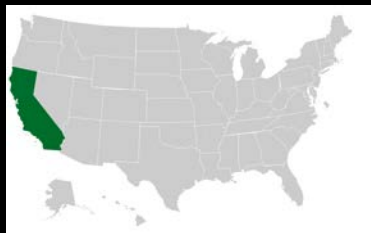
# Cannabinoids

## Adverse Effects & Interactions

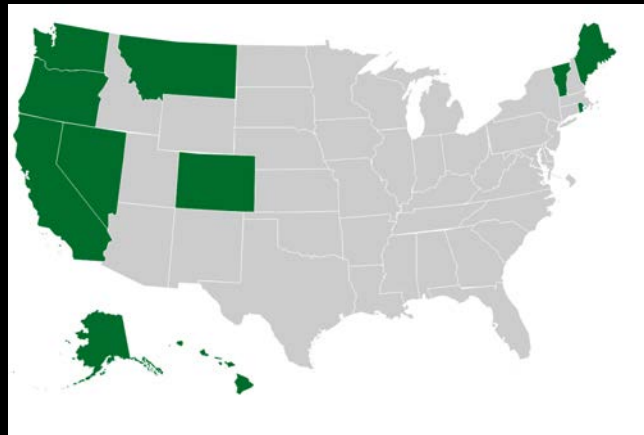
Adverse Effect	~Odds Ratio
Disorientation	5
Dizziness	5
Dry Mouth	4
Euphoria	4
Drowsiness	4
Confusion	4
Balance Issues	3
Hallucinations, Nausea, Vomiting, Diarrhea, & Fatigue	2

Cannabinoid	CYP-2C9	CYP-2C19	CYP-3A4
Δ9-THC	X		X
Δ8-THC	X		X
CBD		X	X
CBN	X		X

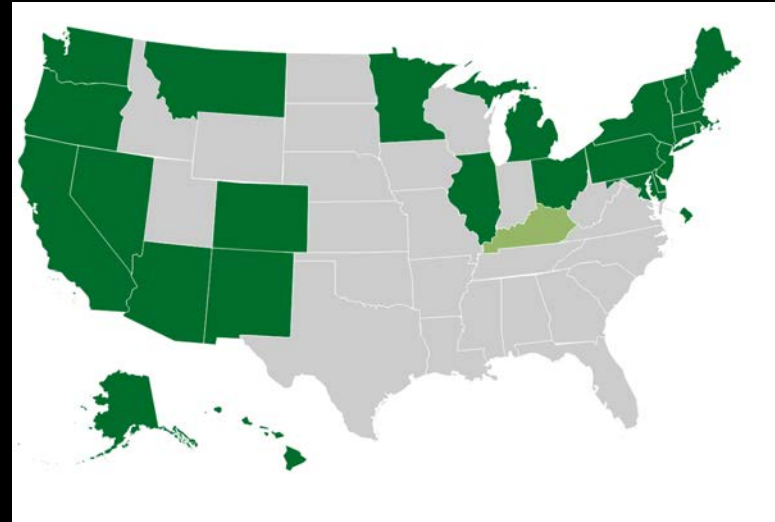
# “Medical” Marijuana States Timeline



1996



2006



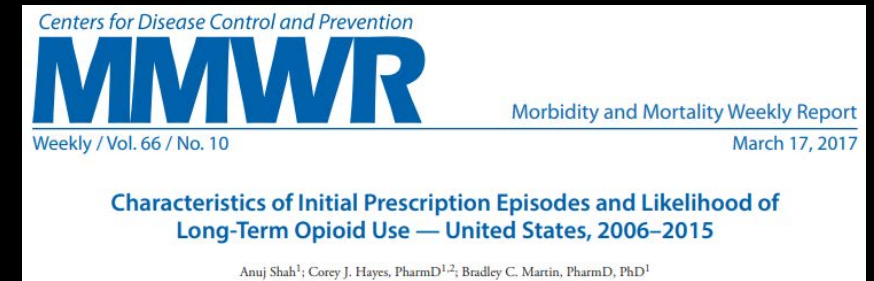
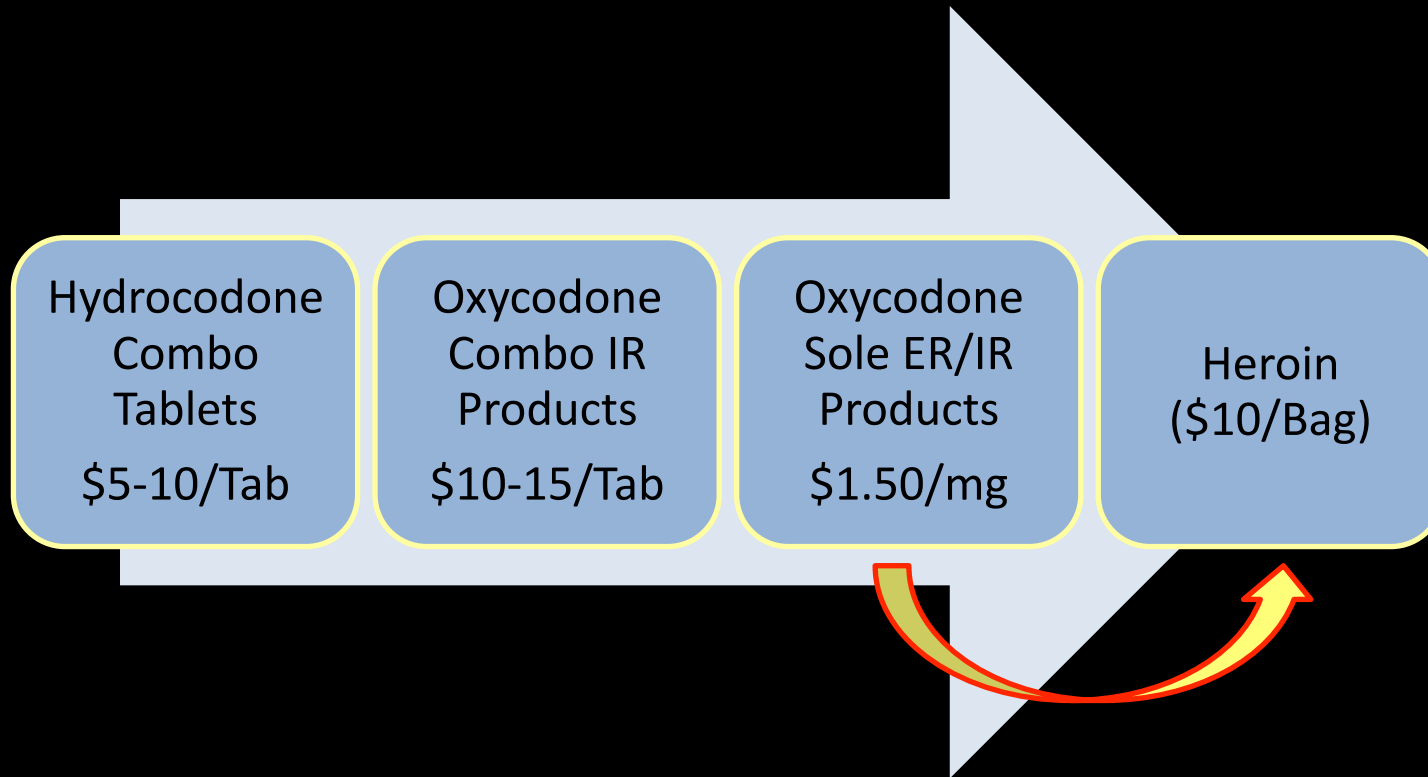
2016

California	1996
Alaska	1998
Oregon	1998
Washington	1998
Maine	1999
Colorado	2000
Hawaii	2000
Nevada	2000
Montana	2004
Vermont	2004
Rhode Island	2006
New Mexico	2007
Michigan	2008
Arizona	2010
New Jersey	2010
Washington, DC	2010
Delaware	2011
Connecticut	2012
Massachusetts	2012
Illinois	2013
New Hampshire	2013
Maryland	2014
Minnesota	2014
New York	2014
Arkansas	2016
Florida	2016
North Dakota	2016
Ohio	2016
Pennsylvania	2016
West Virginia	2017
Oklahoma	2018

# Opiates/Opioids



# Opioid Abuse Transition



**75% of Heroin Users  
Started with Legal  
Prescription Opioids**

# Heroin

## Nicknames

Dope, H, Brown Sugar, Black Tar, Smack, & Dragon

## Mechanism

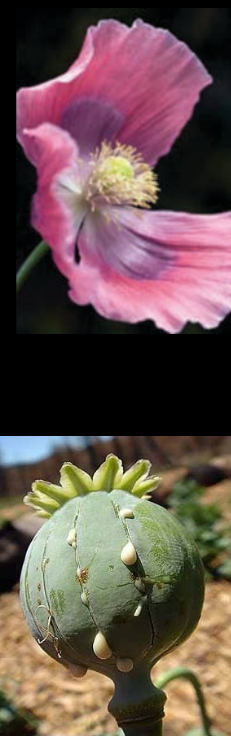
Mu Opioid Receptors

## Chemical

Di-acetyl-morphine



# Heroin Production



1. Purification of raw opium

2. Extractions of morphine from opium

3. Morphine → Diacetylmorphine Base

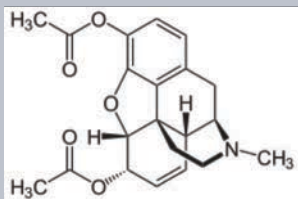
4. Diacetylmorphine Base → Diacetylmorphine HCl Salt



# Laced Heroin

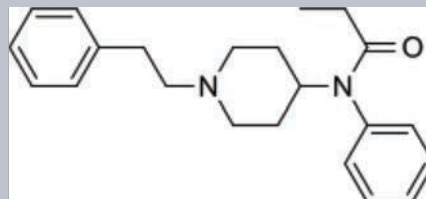
## Heroin

- MME: 3



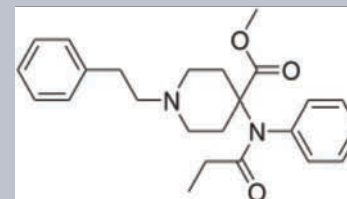
## Fentanyl

- MME: 100
- Theraflu, Bud Ice, or Income Tax



## Carfentanil

- MME: 10,000
- Wildnil
- Elephant tranquilizer



Remifentanyl  
Sufentanyl  
Alfentanyl

# Krokodil

Nicknames

Russian Magic or Poor Man's Heroin

Mechanism

Mu Opioid Receptors

MME  
Factor

Ten (10)

Chemical

Desomorphine (di-hydro-des-oxy-morphine)  
Patented in 1934 as Permonid in Switzerland



Copyright © 2008 Theodor W. Gray





# Kratom

Nicknames	Thang, Thom, & Swim
Mechanism	Potent K-Opioid D2 Agonist COX-2 Anti-inflammatory
Drug Interactions	CYP450 3A4, 2D6, & 1A2 Inhibitor
Chemical	Mitragyna Speciosa Tropical plant in coffee family Native to Southeast Asia



# Salvia

## Nicknames

Salvia Divinorum, La Maria, Magic Mint, or  
Diviner's Sage

## Mechanism

Potent K-Opioid  
D2 Agonist  
Endocannabinoid Modulator

## Drug Interactions

CYP450 1A1, 2C18, 2D6, & 2E1

## Chemical

Sage plant (Mint Family)  
Native to Mexico



# Dextromethorphan (DXM)

Nicknames	Sizzurp, Purple Drank, Purple Tonic Robitussin DM® → Roboshake Delsym® → Agent Orange Coricidin HBP® → Skittles
Mechanism	Non-Selective Serotonin Reuptake Inhibitor, NMDA Antagonist, Opioid Sigma Agonist, & Anesthetic
Chemical	D-enantiomer of levomethorphan (methyl-levorphanol)

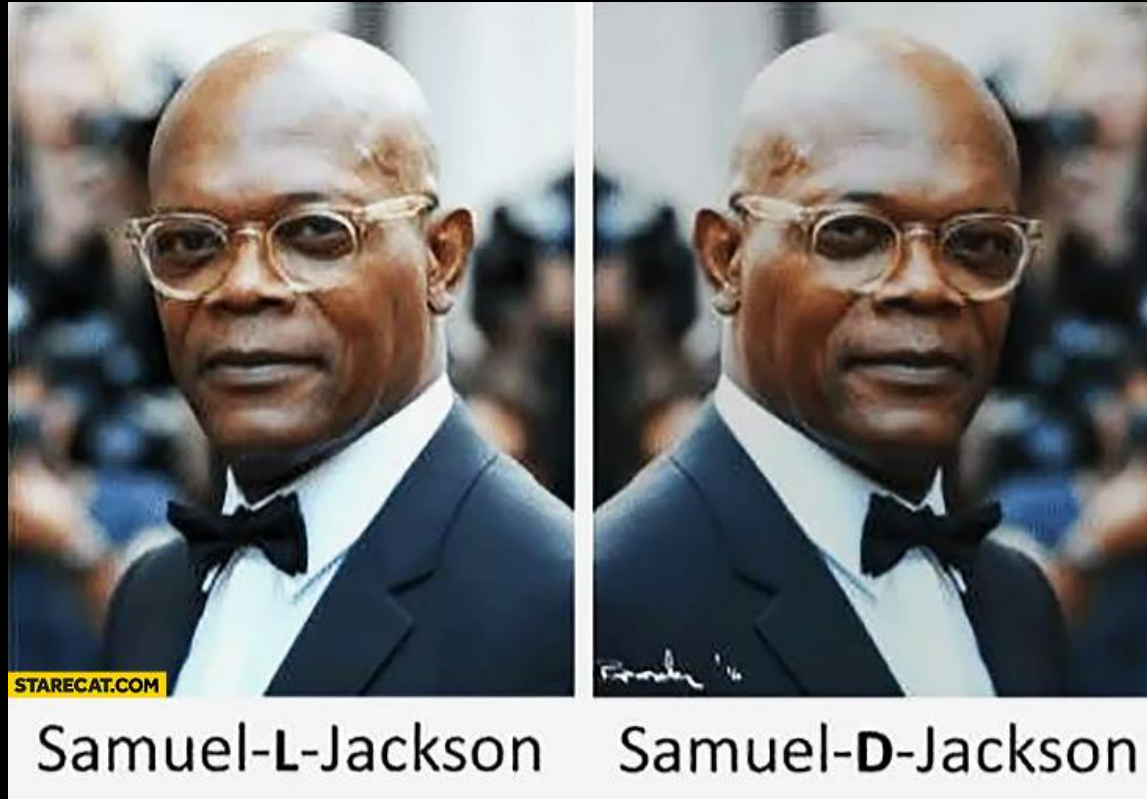


Dose (mg)	Effects
100-200	Mild Stimulation
201-400	Euphoria & Hallucinations
401-600	Distorted Vision & Coordination
601-1500	Dissociative Sedation



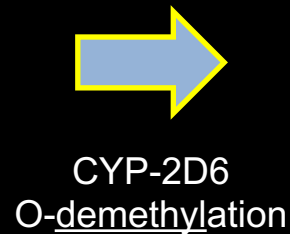
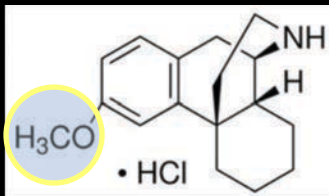
# Chirality

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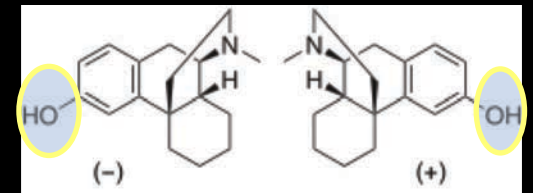


# Opioid “Cousins”

Dextromethorphan  
(DXM)



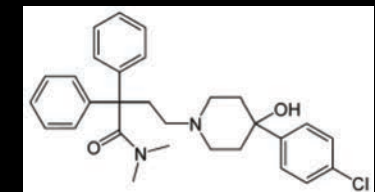
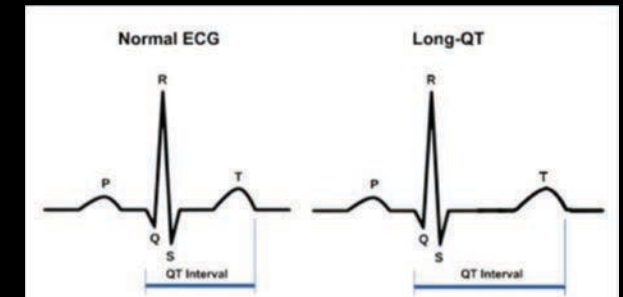
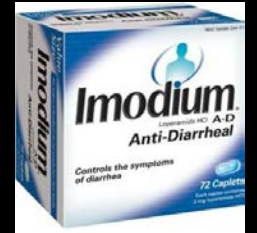
Dextrorphan (DXO)  
“D(+)-enantiomer” of racemorphan



Levorphanol  
“L(-)-enantiomer” of racemorphan

# loperamide

Nicknames	Poor Man's Methadone & Imodium®
Mechanism	Peripheral Mu-Opioid Agonist
Info	1988 Moved from C-V to OTC



# Illicit Substances Overview

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- Marijuana Plant
- Synthetic Marijuana
- Marijuana Extracts

## Opioid-Related Products

- Heroin
- Laced Heroin
- Krokodil
- Kratom
- Salvia
- Dextromethorphan
- Loperamide

# Increased Neurotransmitter Effects

	Serotonin (5HT)	Dopamine (DA)	Norepinephrine (NE)	Opioid
Effects	Hostility/Agitation Muscle Rigidity Shivering Goose Bumps Dilated Pupils Fever/Sweating Diarrhea Seizures Restlessness Tachycardia	“Reward & Pleasure” Schizophrenia Muscle Twitching Amnesia Insomnia Tachycardia	“Fight or Flight” Dilated Pupils Tachycardia Dry Mouth Urinary Retention	Constricted Pupils Confusion Nausea/Vomiting Constipation Dry Mouth Urinary Retention Respiratory Depression
Substances	Peyote Cacti Cocaine DXM Ecstasy Kratom LSD Psychedelic Mushrooms MXE NBOMe PMA	Gravel Peyote Cacti Cocaine Ecstasy Ketamine Khat LSD Bath Salts PCP Salvia	Gravel Cocaine Ecstasy Khat LSD Bath Salts	DXM Heroin Ketamine Kratom Krokodil Salvia U-47700 W-18

# Pharming & Punchbowl Parties

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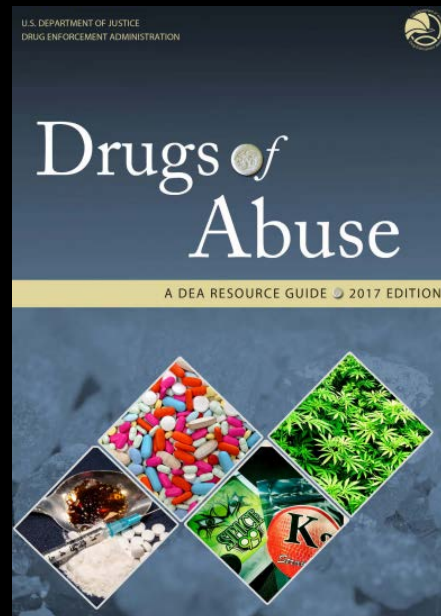
# Resources Concentrating on Illicit Substances

BLUELIGHT

Drugs-Forum  
the international drugs community



European Monitoring Centre  
for Drugs and Drug Addiction



# Support Groups

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## Alcoholics Anonymous (AA)

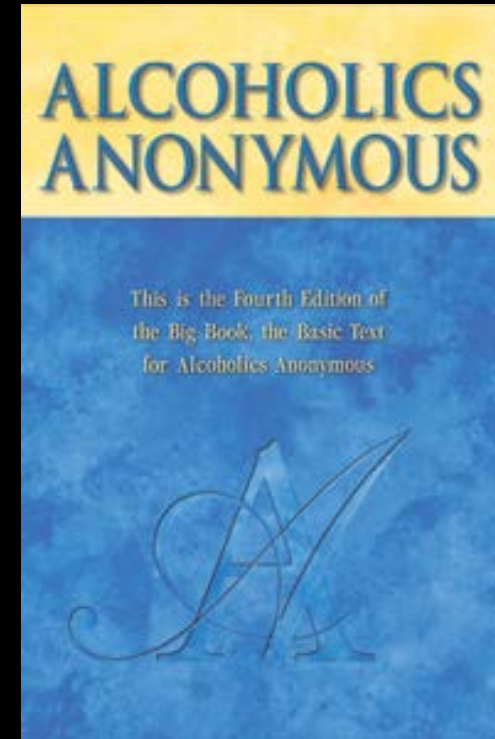
- ❖ <http://www.aa.org/>
- ❖ 212-870-3400

## Narcotics Anonymous (NA)

- ❖ <http://www.na.org/>
- ❖ 1-818-773-9999

## Nar Anon (Family & Friends)

- ❖ [www.nar-anon.org](http://www.nar-anon.org)
- ❖ 1-800-477-6291





# Audience Question #1

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Which of the following illicit substances is a hallucinogen?

- a) Bath Salts
- b) Khat
- c) Ketamine
- d) Carfentanyl



# Audience Question #1 (ANSWER)

---

Which of the following illicit substances is a hallucinogen?

- a) Bath Salts
- b) Khat
- c) **KETAMINE**
- d) Carfentanyl



## Audience Question #2

---

While stopped at a cross-walk on Las Vegas Boulevard (i.e. “The Strip”) at 2am, you notice a college student next to you leaning against a stop light post, shaking, with a red-toned skin color, grinding her teeth, and profusely sweating. If she was to have ingested an illicit substance, which of the following would be the most likely of the listed substances.

- a) Kratom
- b) Scooby Snax
- c) Heroin
- d) Ecstasy



## Audience Question #2 (ANSWER)

---

While stopped at a cross-walk on Las Vegas Boulevard (i.e. “The Strip”) at 2am, you notice a college student next to you leaning against a stop light post, shaking, with a red-toned skin color, grinding her teeth, and profusely sweating. If she was to have ingested an illicit substance, which of the following would be the most likely of the listed substances.

- a) Kratom
- b) Scooby Snax
- c) Heroin
- d) **ECSTASY**



## Audience Question #3

---

Which of the following are effects of various doses of dextromethorphan (i.e. DXM)?

- a) Cough Suppression
- b) Pain Suppression
- c) Hallucinations
- d) Euphoria
- e) All of the Above



## Audience Question #3 (ANSWER)

---

Which of the following are effects of various doses of dextromethorphan (i.e. DXM)?

- a) Cough Suppression
- b) Pain Suppression
- c) Hallucinations
- d) Euphoria
- e) **ALL OF THE ABOVE**



# Discussion

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