Drugs 101
Hallucinogens

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What are Hallucinogens?

- Substances that make you hallucinate?
  - *Not necessarily*
Substances that make you hallucinate?
- Not necessarily
  - Definitions
    - Hallucinogens
    - Dissociative Drugs
      (for the most part, anesthetics)
What are Hallucinogens?

Hallucinogens

Amanita mushrooms (muscimol)
Psilocybe mushrooms (psilocybin)
Peyote & other cacti (contain mescaline)
Datura (Jimson weed) & Angel trumpet (Brugmansia)
LSD (lysergic acid diethylamide)
Salvia divorinum
Morning Glory (d-lysergic acid amide)
Nutmeg
Amanita muscaria  the “magic mushroom”
or “fly agaric”

Alice talks to the caterpillar sitting on the mushroom. He tells her that eating one side will make her taller, and the other side make her shorter.

- Found throughout the U.S.
- Muscimol is the primary psychoactive alkaloid
- Dissociative

(Amanita muscaria. Tim Bekaert, 2005)
Psilocybe cubensis typically contains 1.6 mg psilocybin per gram of dried mushroom

- 40 mcg/kg intoxicates
- 3 to 4 hour duration
- Small brown mushrooms that stain blue to the touch
- Usually cultivated, but also gathered in warm climates
Mescaline

- Hallucinogenic alkaloid (phenethylamine)
- Synthesized in 1919
- Found naturally in peyote and other cacti
Peyote (contains mescaline)

- *Lophophoria williamsii* contains 1.5% mescaline (β-3,4,5-trimethoxyphenethylamine)
- 3mg/kg potent intoxication
- Up to 8 to 10 hour duration
- Continued religious use by indigenous people

Trichocereus species

- Most popular source of non-sacramental mescaline in the U.S. isn’t peyote…
- Can be found in any plant store
Datura stramonium

- Leaves typically cut and smoked
- Contains atropine, scopolamine, and...
- Ancient ceremonial use in the U.S.
- Occasional report of death by ingestion of root
- Many other sources for atropine and scopolamine
- Member of Nightshade family
- “Jimson weed”
Angel’s Trumpet, *Brugmansia*
LSD (Lysergic acid diethylamide)

- Synthesized in Switzerland in 1938 by Albert Hofmann at Sandoz
- Originally found in ergot fungus
- Acts on serotonin receptors
- “Acid”
- “Blotter acid”
- “Window pane”

“Condom” acid, pills and powder, DEA

http://www.nytimes.com/2006/01/07/international/europe/07hoffman.html 8jan2006
Salvia divinorum

- Many other Salvia species may also contain psychoactive chemicals. “Salvinorin A”
- Related to sage plants and the mint family
- Does not grow in the United States naturally, but can readily be cultivated. Of Mexican origin
- First reported in 1962 but popularity increased via Internet. Not a controlled substance but US military and certain jurisdictions are concerned about it
d-Lysergic Acid Amide

**Ipomoea species**
Morning Glory
5-10 grams of seeds

**Argyria nervosa**
Hawaiian Baby Woodrose
4-8 seeds ingested
Nutmeg

- Mild hallucinogen at 1-4 teaspoons, higher doses, over 5 tsp. or 25 grams can cause “nutmeg poisoning”
- Facebook and MySpace groups devoted to getting high on nutmeg
Dissociative Drugs

PCP (phencyclidine)
Ketamine
Dextromethorphan
PCP (phencyclidine)

- Originally developed as a general anesthetic in the 1950s by Parke Davis
- Distorts perceptions and produces feelings of detachment
- Alters distribution of neurotransmitter glutamate
- “Angel Dust”
Ketamine ("Special K")

- Anesthetic developed to replace PCP, manufactured by Pfizer
- Used in human and veterinary medicine
- Injected or dried and snorted
- Feelings of floating, or sometimes terrifying "bad trip" called "K hole"
- "Vitamin K"
- "K"
- "Bump"
DXM (dextromethorphan)

Cough suppressant

- (Also used to boost effects of analgesics for severe pain)
- Typical dose 15-30 mg. for cough
- 4 or more ounces may cause distorted visual perceptions, similar effects to PCP and Ketamine
- “Robo”
- Internet groups to discuss “Robo-ing”
Statistics on Use

- Indiana ATOD Survey (2006)
- Drug AbuseWarning Network (DAWN)
Percentages of Past Year Hallucinogen Use among Persons Aged 12 or Older, by Age Group: 2004 and 2005
### NSDUH Hallucinogen Statistics

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 to 17</td>
<td>2.8%</td>
</tr>
<tr>
<td>18 to 25</td>
<td>6.2%</td>
</tr>
<tr>
<td>26 to 34</td>
<td>2.1%</td>
</tr>
<tr>
<td>35 to 49</td>
<td>0.5%</td>
</tr>
<tr>
<td>50 or Older</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Percentages of Past Year Hallucinogen Use among Persons Aged 12 or Older, by Age Group: 2004 and 2005
NSDUH Hallucinogen Statistics

Percentages of Past Year Use of Specific Types of Hallucinogens among Recent Hallucinogen Initiates* Aged 12 or Older, by Gender: 2004 and 2005

[Bar chart showing the percentages of past year use for each type of hallucinogen among males and females, with Psilocybin (Mushrooms) at 61.1% for males and 41.1% for females, Ecstasy at 37.7% for males and 49.5% for females, LSD at 14.9% for males and 12.7% for females, PCP at 2.8% for males and 6.0% for females, Peyote at 4.1% for males and 1.9% for females, and Mescaline at 2.6% for males and 2.5% for females.]
<table>
<thead>
<tr>
<th></th>
<th>8th</th>
<th>10th</th>
<th>12th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychedelics</td>
<td>2.4</td>
<td>4.0</td>
<td>5.5</td>
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<tr>
<td>LSD</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Others</td>
<td>2.0</td>
<td>3.5</td>
<td>5.0</td>
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</table>
### Indiana ATOD Annual Use Hallucinogens 2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Psychedelics</th>
<th>LSD</th>
<th>Others</th>
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<tbody>
<tr>
<td>6th</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>7th</td>
<td>1.1</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td>8th</td>
<td>2.1</td>
<td>1.7</td>
<td>1.1</td>
</tr>
<tr>
<td>9th</td>
<td>3.1</td>
<td>2.4</td>
<td>1.6</td>
</tr>
<tr>
<td>10th</td>
<td>3.7</td>
<td>2.9</td>
<td>2.0</td>
</tr>
<tr>
<td>11th</td>
<td>4.2</td>
<td>3.1</td>
<td>2.6</td>
</tr>
<tr>
<td>12th</td>
<td>4.5</td>
<td>3.1</td>
<td>3.2</td>
</tr>
</tbody>
</table>
In 2004, an estimated 12,584 ER visits (0.7% of all drug related emergency department visits) involved pharmaceuticals containing dextromethorphan.

The rate of ER visits resulting from nonmedical use of dextromethorphan for those aged 12 to 20 was 7.1 visits per 100,000 population compared with 2.6 visits or fewer per 100,000 for other age groups.

ER patients aged 12 to 20 accounted for almost half (48%) of all the ER visits resulting from nonmedical use of dextromethorphan.

The rates of DAWN ER visits resulting from any use of dextromethorphan among those aged 12 to 20 was 10.3 per 100,000 population compared with 4.3 visits per 100,000 for the population overall.

Alcohol was implicated in about a third (36%) of emergency department visits involving nonmedical use of dextromethorphan.
# Hallucinogens in ER Visits, 2005

<table>
<thead>
<tr>
<th>Drug</th>
<th>Drug-Related ER Visits DAWN Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cocaine</td>
<td>448, 481</td>
</tr>
<tr>
<td>Heroin</td>
<td>164, 572</td>
</tr>
<tr>
<td>Ketamine</td>
<td>275</td>
</tr>
<tr>
<td>LSD</td>
<td>1,864</td>
</tr>
<tr>
<td>PCP</td>
<td>7,535</td>
</tr>
<tr>
<td>Misc. hallucinogens</td>
<td>3,792</td>
</tr>
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## AAPCC Annual Report 2005

<table>
<thead>
<tr>
<th>Substance</th>
<th>Number of human exposures reported to US Poison Control Centers</th>
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<tbody>
<tr>
<td>Hallucinogenic mushrooms</td>
<td>849</td>
</tr>
<tr>
<td>Muscarine mushrooms</td>
<td>19</td>
</tr>
<tr>
<td>Hallucinogenic plants</td>
<td>355</td>
</tr>
<tr>
<td>Solanine plants (nightshade family)</td>
<td>1,166</td>
</tr>
<tr>
<td>Ketamine</td>
<td>161</td>
</tr>
<tr>
<td>Dextromethorphan (APA/ASA)</td>
<td>67,038.00</td>
</tr>
<tr>
<td>Hallucinogens (general, various)</td>
<td>1,924</td>
</tr>
<tr>
<td>Mescaline/peyote</td>
<td>102</td>
</tr>
<tr>
<td>PCP</td>
<td>662</td>
</tr>
</tbody>
</table>

2005 Annual Report of the American Association of Poison Control Centers’ National Poisoning and Exposure Database. *Clinical Toxicology, 44:803-932, 2006*

IPRC ATOD Survey (2006)

AAPCC Annual Report (2005)

Monitoring the Future

NSDUH. *Patterns of Hallucinogen Use and Initiation: 2004 and 2005 (July 5, 2007).*

National Survey on Drug Use and Health (NSDUH)

NIDA: Hallucinogens and Dissociative Drugs.

Drug Abuse Warning Network (DAWN) reports
Thank You!

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