©Opioids and Marijuana

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Overview

Trends
- Use Rates
- Addiction and death

Cannabinoid-Opioid Connection
- Biology
- Evidence

Children at Risk
- Adolescents
- Developing Fetus
- Transgenerations
Trends

Use Rates

Addiction and death
Trends: Marijuana and Heroin Use

Trends: Rising Treatment Admissions

~ 23% of those who use heroin become dependent on it

TEDS data: admissions to treatment ages 12+ for abuse of alcohol and/or drugs in facilities reporting to State administrative data systems.
Data: admissions records received, processed through 10/17/13.
TEDS admissions: not individuals; report up to three substances of abuse that led to the treatment episode.
Trends: Rising Opioid Poisoning Deaths

Heroin or Prescription Opioids

- Opioid analgesics
- Heroin
- Both

Source: CDC/NCHS, National Vital Statistics System, Mortality
72.9% of pregnant teens in rehab admissions used marijuana.

Marijuana use during pregnancy

% Using During Pregnancy

Age 15-17

Age 18-25

Age 26-44

Trends: Rising Neonatal Opioid Withdrawal

# Newborns Born in Withdrawal is Rising

Complications of Opioid Use: Brain function

Opiate effects on cognition

Deficits

- Attention
- Concentration
- Recall
- Visual - spatial skills
- Speed of responding

Long-term deficits

- executive function
- Inhibition of inappropriate responses

## Complications of I.V. Opioid Use

### Infections

<table>
<thead>
<tr>
<th>Viral</th>
<th>Bacterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>Meningitis</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>Osteomyelitis</td>
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<tr>
<td>HIV/AIDS</td>
<td>Abcess</td>
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</tbody>
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### Bad Chemistry

- Meperidine
- MPTP

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Complications of Opioid Use: Poorer Physical Health

- Increased risk of early death
- Increased blood pressure
- Overweight or underweight
- Abnormal liver function
- Increased blood sugar
Complications of I.V. Use: Overdose

• Shallow, slow breathing
• Pinpoint pupils
• Slow heart rate
• Low body temperature
• Stupor or coma
• Death, fixed, dilated pupils
Cannabinoid-Opioid Connection

- Biology
- Evidence
Heroin or Morphine Enhance Reward of Other Drugs, including

- THC: psychoactive chemical in marijuana
- Psychostimulants: cocaine, methamphetamine
- Nicotine
- Alcohol
Cannabinoid and Opioid (Δ) Receptors Exist in Proximity on Same Cortical Cells

Cannabinoid-Opioid Connection
Children at Risk

- Adolescent
- Developing Fetus
- THC Exposure Long Before Conception
Adolescent Marijuana Use and Opioid Addiction: twin study

Twins A started marijuana before 17, Twins B after age 17:
Twin A is 4x more likely to develop opioid addiction

% Addicted to Opioids

Use Mj pre-17

Use Mj post-17

Michael T. Lynskey; Andrew C. Heath; Kathleen K. Bucholz JAMA, January 22/29, 2003—Vol 289, 427-433
THC Exposure during Rodent Adolescence Primes Brain to Seek More Heroin *After Maturation*

Adult Rats Exposed to THC in utero Show Enduring behavioral, brain impairment related to opioid reward/stress system

- **Longer:** Vulnerability to self-administer heroin
- **Shorter:** Time to first heroin-seeking session
- **Increased:** Response to lower doses of heroin
- **Increased:** Heroin seeking after a mild stress
- **Increased:** Heroin-seeking if access to heroin removed

Stopping marijuana long before parenting children, may still increase a child’s heroin-seeking?

Marijuana and Heroin

**Human young adolescent marijuana users**

- As adults: Use and abuse heroin, other drugs more

**Rodent adolescents exposed to THC**

- Adults seek heroin more avidly
- Adult offspring consume more heroin
- Show impaired brain and behavior (opioid reward/stress system)
- Other brain, behavioral changes

**Rodent pregnant females exposed to THC**

- Adult offspring consume more heroin
- Show more heroin withdrawal
- Later produce offspring

**Rodent adolescent male, females exposed to THC long before mating;**

- Adult offspring consume more heroin
- Show other brain, behavioral changes
Opioid Use fell dramatically from 1907/08 to 2006

Source: UN Office on Drugs and Crime, 2008 Report