PART 1: STIMULANTS
15.1 Million People with a Past Year Alcohol Use Disorder (74.9% of People with an SUD)

People with Alcohol and Illicit Drug Use Disorders (11.6% of People with SUDs)

2.3 Million

People with an Alcohol Use Disorder Only (63.3% of People with an SUD)

5.1 Million

People with an Illicit Drug Use Disorder Only (25.1% of People with an SUD)

7.4 Million People with a Past Year Illicit Drug Use Disorder (36.7% of People with an SUD)

20.1 Million People Aged 12 or Older with Past Year SUDs

STIMULANT ABUSE IN THE U.S.

- 1.6 Million current users of amphetamine type drugs
- 36% current meth users
- 64% current non-medical use of Rx stimulants
- 1.5 Million current users of cocaine
Stimulants (Ritalin, Adderall) Act like Cocaine Directly in the Dopamine Cells
Distribution in the Human Brain of Cocaine and Ritalin

[C11C] COCAINE

[C11C] METHYLPHENIDATE

Cocaine and Ritalin Act on the Same Sites in Brain (Volkow, et al., BNL)

STIMULANT SUB-DRUGS

• Cocaine: 1980’s
• Ecstasy: 1990’s
• Methamphetamine: 2000’s
• Bath Salts: 2010’s
• Molly: at present
• Rx stimulants: methylphenidate, amphetamine salts, etc.
Effects of Drugs on Dopamine Release

**METHAMPHETAMINE**

- % of Basal Release vs. Time After Methamphetamine
- Peak release at 1 hour after administration

**COCAINE**

- % of Basal Release vs. Time After Cocaine
- Peak release at 2 hours after administration

**NICOTINE**

- % of Basal Release vs. Time After Nicotine
- Peak release at 1 hour after administration

**ETHANOL**

- % of Basal Release vs. Time After Ethanol
- Dose (g/kg ip) and time of maximum release

*Source: Shoblock and Sullivan; Di Chiara and Imperato*
STIMULANTS

**Effects:** incl. focus/concentration, wakefulness/energy, incl. libido, euphoria, decreased appetite, incl. BP & heart rate, sweating, hyperthermia, seizures

**Acute intoxication management:** see table

**Withdrawal:** hypersomnia, depression, increased appetite, vivid dreams, restlessness, craving
<table>
<thead>
<tr>
<th><strong>CLINICAL PROBLEM</strong></th>
<th><strong>MODERATE SYNDROME</strong></th>
<th><strong>SEVERE SYNDROME</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety; agitation</td>
<td>Provide reassurance; place in a quiet, nonthreatening environment.</td>
<td>Diazepam (10–30 mg PO, 2–10 mg IM, IV) or lorazepam (2–4 mg PO, IM, IV); may repeat every 1–3 h</td>
</tr>
<tr>
<td>Paranoia; psychosis</td>
<td>Place in a quiet, nonthreatening environment; benzodiazepines for sedation</td>
<td>High-potency antipsychotic (e.g., haloperidol) or second-generation antipsychotic</td>
</tr>
<tr>
<td>Hyperthermia</td>
<td>Monitor body temperature; place in a cool room.</td>
<td>If temperature &gt;102°F (oral), use external cooling with cold water, ice packs, hypothermic blanket; if &gt;106°F, use internal cooling; epigastric lavage with iced saline</td>
</tr>
<tr>
<td>Seizures</td>
<td>Diazepam (2–20 mg IV, &lt;5 mg/min) or lorazepam (2–8 mg)</td>
<td>For status epilepticus: IV diazepam or phenytoin (15–20 mg/kg IV, &lt;150 mg/min) or phenobarbital (25–50 mg IV)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Monitor blood pressure closely; benzodiazepines for sedation</td>
<td>If diastolic &gt;120 for 15 min, give phentolamine (2–10 mg IV over 10 min).</td>
</tr>
<tr>
<td>Cardiac arrhythmia</td>
<td>Monitor electrocardiogram, vital signs; benzodiazepines for sedation</td>
<td>As appropriate for specific rhythm, based on advanced cardiac life support criteria</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>Benzodiazepines for sedation; supplemental oxygen; sublingual nitroglycerin for vasodilation; aspirin for anticoagulating; morphine for pain</td>
<td>Give nitrates IV for coronary artery dilation; phentolamine (2–10 mg IV) to control blood pressure; thrombolysis, angioplasty (if clot confirmed and no hemorrhage)</td>
</tr>
<tr>
<td>Rhabdomyolysis</td>
<td>IV hydration to maintain urine output &gt;2 mL/kg/h</td>
<td>Force diuresis with aggressive intravenous hydration</td>
</tr>
<tr>
<td>Increased urinary drug excretion</td>
<td>Cranberry juice (8 oz TID) or ammonium chloride (500 mg PO every 3–4 h) until urine pH &lt; 6.6 (if renal and hepatic function are normal)</td>
<td>Same as for moderate intoxication</td>
</tr>
<tr>
<td>Recent (few hours) oral drug ingestion</td>
<td>Activated charcoal orally or gastric lavage via nasogastric tube (if patient is awake and cooperative)</td>
<td>Gastric lavage via nasogastric tube after endotracheal intubation (if patient is unconscious)</td>
</tr>
</tbody>
</table>
STIMULANTS (CONT’D)

Long term effects: anxiety, confusion, insomnia, mood problems, violent behavior, paranoia/hallucinations/delusions, weight loss, severe dental problems (“meth mouth”), skin picking due to formication and tactile hallucinations

Health risks: blood borne infections, HTN, arrhythmias, AMI, cardiomyopathy, stroke, placenta previa, premature birth, low birth weight infants with behavioral problems
TREATMENT

There are **no** FDA-approved medications.

- TCA’s (desipramine)
- Topiramate
- Disulfiram
- Bupropion
- Gabapentin
- N-acetyl cysteine: 1,200 mg oral bid
BEHAVIORAL THERAPIES

• Cognitive-behavioral therapy (CBT)

• Contingency management, or motivational incentives

• The Matrix Model

• 12-Step facilitation therapy
Urine Drug Testing

• Cocaine → Benzoylecgonine remains in urine 1 – 3 days after single use

• May be present up to 7 – 12 days after repeated high doses

• Very low likelihood of false positives

• Methamphetamine → methamphetamine (l,d-isomers) → amphetamines

• Tests positive up to 72 hours after last use, up to one week for chronic use

• False positives: Vicks vapor rub, selegiline, bupropion
PRESCRIPTION STIMULANTS

- Adderall → amphetamines (only)
- Methylphenidate → will not show up on point of care testing, only on GC/MS
TREATMENT OF ADHD IN STIMULANT USE DISORDER

- Be certain of ADHD Dx
  - Consult with mental health expert
- Assess Risk/Benefits (diversion / misuse / exacerbate SUD)
- Start with Non-stimulant Rx
- Next ➔ Sustained-release stimulant Rx
- Other elements:
  - Psycho-education
  - Literature
  - CBT
  - Structured Skills Training
  - Coaching

CSAM 2017
TREATMENT OF ADHD IN STIMULANT USE DISORDER

Rx Choices:

- **Bupropion (Wellbutrin®)**

- **Atomoxetine (Strattera®)**

- **Methylphenidate (Concerta®)**

- **Lisdexamfetamine (Vyvanse®)**

- Rx with Stimulant ➔ Signed Tx Agreement (like LT opioids)

CSAM 2017
Figure 2. Partial Recovery of Brain Dopamine Transporters in Methamphetamine (METH) Abuser After Protracted Abstinence


### False Positives in Immunoassay Urine Drug Screens

<table>
<thead>
<tr>
<th>AMPHETAMINES</th>
<th>BARBITURATES</th>
<th>METHADONE</th>
<th>PHENCYCLIDINE (PCP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amfetamine (Symmetrel) (Parkinson's disease)</td>
<td>Ibuprofen, Naproxen (Anti-inflammatories)</td>
<td>Chlorpromazine (Thorazine) (Antipsychotics)</td>
<td>Dexedrornaphetamine (Dextrocerin) (AChE; Stimulant)</td>
</tr>
<tr>
<td>Ropinirol (Wellbutrin, Zyban) (Antidepressant; smoking cessation)</td>
<td>Phenylephrine (Dilantin) (Antiarrhythmics)</td>
<td>Clomipramine (Anafranil) (Antidepressants)</td>
<td>Deutormethophan (Delsym, Robitussin) (Anti-tussive)</td>
</tr>
<tr>
<td>Chloroquine (Aralon) (Anti-malarial)</td>
<td>Phenothiazine (Mycoine) (Antipsychotics)</td>
<td>Diphenhydramine (Benadryl) (Antihistamines)</td>
<td>Diphenhydramine (Benadryl) (Antihistamines)</td>
</tr>
<tr>
<td>Chlorpromazine (Thorazine) (Antipsychotics)</td>
<td>BENZODIAZEPINES</td>
<td>Diazepam (Valium) (Anxiolytics)</td>
<td>Diazepam (Valium) (Anxiolytics)</td>
</tr>
<tr>
<td>Dextromethorphan (Dexedrine) (ADHD; Stimulant)</td>
<td>Sertraline (Zoloft) (Antidepressants)</td>
<td>Quetiapine (Seroque) (Antipsychotics)</td>
<td>Imipramine (Tofranil) (TCA antidepressants)</td>
</tr>
<tr>
<td>Ephedrine (Ephedra, Ma Huang) (Stimulant)</td>
<td>CANNABINOIDS</td>
<td>Tetrahydrocannabinol (Marinol) (Nausea, Appetite stimulator)</td>
<td>Ketamine (Anesthetic)</td>
</tr>
<tr>
<td>Mefoxin (Mefoxan)</td>
<td>OPIATES / OPIOIDS</td>
<td>Methadone (Dolophine) (Antipsychotics)</td>
<td>Methadone (Dolophine) (Antipsychotics)</td>
</tr>
<tr>
<td>Procainamide (Antithrombotic)</td>
<td>Hemp seed oil, Cannabis seed, Hemp oil (Hemp food)</td>
<td>Dextromethorphan (Delsym, Robitussin) (Anti-tussive)</td>
<td>Methadone (Dolophine) (Antipsychotics)</td>
</tr>
<tr>
<td>Pentoxifylline (Adipex, Suprenza) (Caffeine)</td>
<td>NSAIDs (ibuprofen, naproxen, ketorolac, piroxnc, etc)</td>
<td>Diphenhydramine (Benadryl) (Antihistamines)</td>
<td>LSD (TCA antidepressant)</td>
</tr>
<tr>
<td>Promethazine (Phenergan) (Nausea)</td>
<td>Pantoprazole (Protonix) (GERD, Peptic ulcer)</td>
<td>Fluoroquinolones (Levaquin, Avelox, Cipro, Floxin)</td>
<td>Amitriptyline (Elavil) (TCA antidepressant)</td>
</tr>
<tr>
<td>Propranolol (Inderal) (HTN, Migraines; Anti-arrhythmic; visceral tachycardia, stroke/angina)</td>
<td>Promethazine (Phenergan) (Nausea)</td>
<td>Poppy seeds and oil (Yummy Is lapel and bread)</td>
<td>Dicyclomine (Bentyl) (Anticholinergic for IBS)</td>
</tr>
<tr>
<td>Pseudoephedrine (Sudafed) (Nasal decongestant)</td>
<td>COCAINE</td>
<td>Quinine (Antimalaria)</td>
<td>Ergotamine (Migranes)</td>
</tr>
<tr>
<td>Ranitidine (Zantac) (GERD; Peptic ulcers)</td>
<td>Antidepressants (Anesol) (Antidepressants)</td>
<td>Ritalin (Tuberculosis)</td>
<td>Promethazine (Phenergan) (Nausea/kombina)</td>
</tr>
<tr>
<td>Selazine (Selazine, Eldepryl) (Parkinson's disease)</td>
<td>Coca leaf teas</td>
<td>OXYCODONE</td>
<td>Summitriptan (Imitrex) (Migranes)</td>
</tr>
<tr>
<td>Trazodone (Desyrel) (Antidepressant; insomnia; Migraines)</td>
<td>Tonic water</td>
<td>Hydrocodone, Oxymorphone, Hydrocodone, Codeine</td>
<td></td>
</tr>
</tbody>
</table>
PART 2: CANNABIS
(AKA Marijuana)
EPIDEMIOLOGY OF CANNABIS USE: NSDUH, 2016

ILLICIT DRUG USE IMPACTS MILLIONS: MARIJUANA MOST WIDELY USED DRUG

- Marijuana: 13.9% (37.6 million)
- Misuse of Psychotherapeutic Rx Drugs: 6.9% (18.7 million)
- Cocaine: 1.9% (5.1 million)
- Hallucinogens: 1.8% (4.9 million)
- Inhalants: 0.6% (1.7 million)
- Methamphetamine: 0.5% (1.4 million)
- Heroin: 0.4% (948,000)

EPIDEMIOLOGY OF CANNABIS USE

- Most commonly used illegal substance in the US and world
- Lifetime prevalence in US: 42-46%
- Past year use highest in age 18-25 group
- Past year Cannabis Use Disorder (CUD) highest in ages 21-26
- CUD (old abuse/dependence):
  - 2001: 1.5%
  - 2012: 2.9%
  - Psychiatric samples: 15-50%
- Greater increases in use and CUD in US states with Medical Marijuana Laws

https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2619522
**TRENDS IN MARIJUANA USE PATTERNS, DISORDERS AND PERCEIVED RISK OF HARM**

![Graph showing trends in marijuana use patterns, disorders, and perceived risk of harm](image)

*Figure:* Trends in marijuana use patterns, marijuana use disorders, and perceived risk of harm. Annual prevalence and trends in any marijuana use, daily or near daily marijuana use, marijuana use disorders, mean number of days of marijuana use, and perception of no risk of harm from marijuana use in adults in the USA. *Joinpoints indicate significant changes in non-linear trends.*

Compton W et al, 2016

CANNABINOIDS

• **Cannabis plant** (*C. sativa*, *C. indica*)
  – Contains >400 chemical compounds
  – 60 identified cannabinoids thus far

• **Tetrahydrocannabinol** (THC)
  – Primary compound to produce psychoactive effects or the “high”
  – Acts on CB1 receptor
  – Can cause anxiety

• **Cannabidiol**
  – Not psychoactive
  – Relieves anxiety
# COMMON CANNABIS PREPARATIONS

## Table 2. Common Cannabis Preparations

<table>
<thead>
<tr>
<th>Preparations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Dried plant product consisting of leaves, stems, and flowers; typically smoked or vaporized</td>
</tr>
<tr>
<td>Hashish</td>
<td>Concentrated resin cake that can be ingested or smoked</td>
</tr>
<tr>
<td>Tincture&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Cannabinoid liquid extracted from plant; consumed sublingually</td>
</tr>
<tr>
<td>Hashish oil</td>
<td>Oil obtained from cannabis plant by solvent extraction; usually smoked or inhaled; butane hash oil (sometimes referred to as “dabs”), for example</td>
</tr>
<tr>
<td>Infusion&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Plant material mixed with nonvolatile solvents such as butter or cooking oil and ingested</td>
</tr>
</tbody>
</table>

<sup>a</sup> These preparations are available from state-approved medical marijuana dispensaries.
THC CONTENT OF CANNABIS PRODUCTS

• THC content of cannabis products
  – Whole plant: 1-5% THC
    • However, many hybrid strains with names like Girl Scout Cookies, King Tut, Blissful Wizard have THC concentrations up to 35% THC
  – Unfertilized flowers: 7-15% THC
  – Hashish or resin: 10-20% THC
  – Hash oil: 20-60% THC

• Route of Use
  – Smoking, vaporizing: onset 1 min, high lasts 4 hrs
  – Ingesting: onset 30 mins, high lasts 12 hrs
  – Topical (oils)
PHARMACEUTICAL GRADE CANNABINOIDS

- **FDA-approved cannabinoids**
  - Dronabinol (Marinol®, THC) oral
    - Anorexia in people with HIV/AIDS
    - Refractory nausea and vomiting in people undergoing chemotherapy (CINV)
  - Nabilone (Cesamet®)
    - For severe nausea and vomiting caused by cancer chemotherapy (CINV)
  - Cannabidiol (Epidiolex®) oral (CBD)
    - Treatment resistant seizures
    - Approved, not yet available

- **Approved in UK and other countries, not US**
  - Nabiximols (Sativex®) oral mucosal spray
    - ~50/50 mixture THC and CBD
    - Spasticity in MS
Cannabinoid Receptor 1 (CB1) Distribution in the Brain

Endogenous cannabinoids:
- Normally produced by the brain
- Anandamide
- 2-AG

https://www.drugabuse.gov/publications/drugfacts/marijuana
## CANNABINOID RECEPTOR 1 (CB1)

<table>
<thead>
<tr>
<th>CB1 receptor location</th>
<th>Clinical manifestations of THC activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral cortex</td>
<td>Altered consciousness, perceptual distortions, memory impairment, hallucinations</td>
</tr>
<tr>
<td>Hypothalamus</td>
<td>Increased appetite</td>
</tr>
<tr>
<td>Brain stem</td>
<td>Antiemetic, tachycardia, reduced BP, drowsiness, pain reduction, reduced spasticity, reduced tremor</td>
</tr>
<tr>
<td>Basal ganglia</td>
<td>Slowed reaction time</td>
</tr>
<tr>
<td>Cerebellum</td>
<td>Reduced spasticity, impaired coordination</td>
</tr>
<tr>
<td>Hippocampus</td>
<td>Memory impairment</td>
</tr>
<tr>
<td>Nucleus accumbens</td>
<td>Motivation and reward</td>
</tr>
<tr>
<td>Amygdala</td>
<td>Increased or decreased anxiety; Increased or decreased panic</td>
</tr>
<tr>
<td>Spinal cord</td>
<td>Altered pain sensitivity</td>
</tr>
</tbody>
</table>

DSM-5 DISORDERS

- **Cannabis Use Disorder (CUD)** criteria consistent with other Use DO’s
- **Cannabis Intoxication**
- **Cannabis Withdrawal**

**Intoxication:**
- Clinically significant problematic behavioral or psychological changes: impaired motor coordination, euphoria, anxiety, sensation of slowed time, impaired judgment, social withdrawal
- Two (or more) within 2 hours of use:
  - Conjunctival injection.
  - Increased appetite.
  - Dry mouth.
  - Tachycardia.

**Withdrawal:**
- Cessation of cannabis use that has been heavy and prolonged
- (Three (or more) of the following develop within approximately 1 week:
  - Irritability, anger, or aggression.
  - Nervousness or anxiety.
  - Sleep difficulty (e.g., insomnia, disturbing dreams).
  - Decreased appetite or weight loss.
  - Restlessness.
  - Depressed mood.
  - At least one of the following physical symptoms causing significant discomfort: abdominal pain, shakiness/tremors, sweating, fever, chills, or headache.
ADDICTIVE POTENTIAL OF CANNABIS

• All users → 9% addicted/CUD
• Adolescent users → 17% addicted/CUD
• Daily users → 25-50% addicted/CUD
SCREENING FOR CANNABIS USE DISORDERS

- **CUDIT-R**
- **Cannabis Use Disorders Identification Test—Revised**
- **8 questions, scored 0-4 points each**
- **Cutoffs:**
  - Score > 8 = hazardous Cannabis Use
  - Score > 12 = Possible CUD, see an expert

https://alcohol.dasa.ncsu.edu/assess-yourself/cudit-r/

**The Cannabis Use Disorder Identification Test – Revised (CUDIT-R)**

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Monthly or less</th>
<th>2-4 times a week</th>
<th>2-3 times a week</th>
<th>4 or more times a week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often do you use cannabis?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. How many hours were you &quot;stoned&quot; on a typical day when you had been using cannabis?</td>
<td>0</td>
<td>1 or 2</td>
<td>3 or 4</td>
<td>5 or 6</td>
<td>7 or more</td>
</tr>
<tr>
<td>3. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>4. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>Daily or almost daily</td>
</tr>
</tbody>
</table>

**This scale is in the public domain and is free to use with appropriate citation:**


This questionnaire was designed for self-administration and is scored by adding each of the 8 items:
- Question 1-7 are scored on a 0-4 scale
- Question 8 is scored 0, 2 or 4
- Scores of 8 or more indicate hazardous cannabis use, while scores of 12 or more indicate a possible cannabis use disorder for which further intervention may be required.
DRUG TESTING ISSUES

• THC is detectable in urine drug screens (UDS) for up to 4 weeks in regular or heavy users
  – Long half-life metabolites, fat storage, enterohepatic recirculation

• Threshold of 50 ng/ml for initial screening
  – Passive inhalation studies not above 20 ng/ml

• False positives:
  – Marinol (because it is THC)
  – Efavirenz
  – Unlikely NSAIDs, Hemp foods
## Therapeutic Evidence for Cannabis Use

<table>
<thead>
<tr>
<th>Rating 1: Minimal or No Evidence</th>
<th>Medical Disorders</th>
<th>Psychiatric Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating 2: Equivocal or Modest Evidence</td>
<td>Spasticity in Multiple Sclerosis Neuropathic Pain</td>
<td>Chemotherapy-Induced Nausea/Vomiting HIV Wasting Syndrome</td>
</tr>
<tr>
<td>Rating 3: Strong Evidence</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>CLEAR HARMS</td>
<td>Glaucoma</td>
<td>Schizophrenia Bipolar Disorders</td>
</tr>
</tbody>
</table>

George, T.P. et al., 2017, under review
CANNABIS USE DISORDER/SELF-INJURY

Schizophrenia & Cannabis: Dose Effects

- Specificity to schizophrenia
- Dose-response relationship

Swedish Conscript Sample (N=50,053)

Cannabis use is associated with an increased risk of developing schizophrenia in a dose dependent fashion

PHARMACOLOGIC TREATMENTS FOR CUD

• None FDA approved

• Evidence positive for:
  – N-acetyl cysteine 1200 mg BID, OTC reduced use and +UDS compared to placebo (Gray K, 2012)
  – Gabapentin 1800 mg daily decreased use, +UDS and withdrawal symptoms (Mason B, 2012)
  – Dronabinol 20 mg BID reduced withdrawal, not relapse; higher retention (Levin F, 2011)
  – Nabiximols reduced withdrawal; higher retention (Allsop D, 2014)

• Negative or high dropout studies:
  – Nefazodone, bupropion, buspirone
  – Rimonabant (CB1 partial agonist) not approved in US, removed from market in Europe due to increased SI
BEHAVIORAL TREATMENTS FOR CUD

• Cognitive Behavioral Therapy
• Motivational Interviewing
• Contingency Management
• Group Therapy

• Cannabis Youth Treatment (CYT) study
  – Motivational Enhancement Therapy
  – Cognitive Behavioral Therapy
  – Adolescent Community Reinforcement Approach
  – Multidimensional Family Therapy

NATIONAL ACADEMIES OF SCIENCES (NAS) REPORT ON HEALTH EFFECTS OF CANNABIS AND CANNABINOIDS, 2017

• **Benefits**
  
  – *Substantial evidence* - chronic pain, CINV, patient-reported spasticity in MS
  
  – *Moderate evidence* - sleep disturbance
  
  – *Limited evidence* - weight loss in HIV/AIDS, clinically reported spasticity in MS, Tourette syndrome, social anxiety, PTSD, better outcomes in TBI
  
  – *No meaningful evidence* - cancer, cancer-related anorexia, anorexia nervosa, IBS, epilepsy, spasticity in spinal cord injury, ALS, Huntington’s disease, Parkinson’s disease, dystonia, addiction, schizophrenia

Summary Courtesy of Penny Ziegler, MD
Negative Effects

- Substantial evidence: increased risk of MVA, low birth wt., increased risk of psychosis in adolescents, worsened negative symptoms of schizophrenia in adults
- Moderate evidence: acute cognitive impairment during use, increased risk of mania or hypomania in bipolar patients, increased suicidal ideation and attempts, increased completed suicide, increased social anxiety
- Limited evidence: complications of pregnancy, likelihood neonate will go to NICU, impaired academic performance, unemployment, impaired social skills, impaired cognition despite sustained abstinence, increased severity of positive symptoms in schizophrenia, worsening of bipolar disorder, anxiety, PTSD, non seminoma testicular cancer
- No meaningful evidence: New onset PTSD, increase or decrease in depression, increase or decrease in most cancers, increased risk of cancer in children of cannabis using mothers, MI, CVA, MS, diabetes
NAS RECOMMENDATIONS RE: CANNABIS

#1- To develop a comprehensive evidence base on the short- and long-term health effects, public agencies, philanthropic and professional organizations, private companies and clinical and public health research groups should provide funding and support for a national cannabis research agenda.

#2- To promote the development of conclusive evidence on short- and long-term health effects of cannabis use, agencies of the USDHHS, including NIH and CDC, should jointly fund a workshop to develop a set of research standards and benchmarks to guide and ensure the production of high-quality cannabis research.

#3- To ensure that sufficient data are available to inform research on the short- and long-term health effects of cannabis use, the CDC, SAMHSA, ASTHO, state and local public health departments should fund and support improvements to federal public health surveillance systems and state-based public health surveillance efforts.

#4- CDC, NIH, FDS, industry groups and nongovernmental organizations should fund convening a committee of experts tasked to produce an objective and evidence-based report that fully characterizes the impacts of regulatory barriers to cannabis research and that proposes strategies for supporting development of resources and infrastructure necessary to conduct a comprehensive research agenda.


Courtesy of Penny Zegler, MD