

Marijuana

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Marijuana (Cannabis Use Disorder) **Learning Goals/Objectives**

- **Discuss epidemiology and comorbidity**
- **Review the DSM-5 criteria for Cannabis-Related Disorders: Cannabis Use Disorder, Cannabis Intoxication, Cannabis Withdrawal**
- **Discuss the acute management of cannabis intoxication and withdrawal.**
- **Discuss the various long term treatment modalities**
- **Briefly discuss synthetic cannabinoids**
- **Overview of marijuana legalization in the US**

Marijuana (Cannabis)

- **Marijuana is the most common name used in the US for the *Cannabis sativa* plant.**
- **Cannabis is the most common term used in science and worldwide to refer to the various psychoactive products derived from the *Cannabis sativa* plant.**

Marijuana (Cannabis)

- **Cannabis is the most commonly used illegal substance worldwide.**
- **Approximately 4% of the world's population between the ages of 15 and 64 years have been estimated to have used cannabis in the past year**
- **Cannabis use has generated continued controversy regarding its addictive potential, health consequences, medicinal use potential, and legal status**

Common Street Terms for Cannabis

- *Pot, Weed, Blunt, Hemp, Reefer, Hash, Mary Jane, Aunt Mary, Ganja, Roach, Nail, Dube, etc.*
- Common synthetic cannabinoid street terms:
 - *K2, Spice*

Epidemiology

- Cannabis is the most commonly used illegal substance in the US and in the world.
- US prevalence rates with specific socio-demographic variables:
 - Age: Lifetime and annual prevalence rates are significantly higher in the younger population, specifically ages 18-25
 - Sex: Lifetime and annual prevalence rates are significantly higher in men
 - Race/Ethnicity: Annual prevalence rates are higher in Blacks, than Whites or Hispanics
 - Education: *no significant association* with lifetime prevalence rates
 - Marital status: Lifetime use is greater in those separated or divorced.

Comorbidity

- **Comorbid substance use disorders:**
 - Increased risk of co-occurring Alcohol, Tobacco (nicotine), Sedative, Cocaine, other Stimulant, Opiate Use disorders compared to adults who do not use cannabis
- **Comorbid mental illnesses**
 - Mood and Anxiety disorders occur frequently
 - Most prevalent: MDD, mania, specific phobias, generalized anxiety disorder.
- **Cannabis use occurs more frequently in patients with mental illness compared to the general population.**

THC

- **Over 60 cannabinoids are found in marijuana.**
- **The psychoactive properties of cannabis are primarily due to *delta-9-tetrahydrocannabinol* (THC).**
- **THC mimics the action of natural cannabinoids that the body produces and binds to cannabinoid receptors, CB₁ and CB₂.**

THC

- **CB₁ and CB₂ are found in several brain regions including the frontal cortex, striatum, and hippocampus.**
- **The localization of these receptors might account for the clinical presentation of cannabis use.**
- **Neuroanatomical findings show that CB₁ modulates the function of dopamine.**
- **This interaction manipulates motor activity, endocrine regulation, appetite, learning, memory, cognition, mood and pain perception.**

Preparations

THC concentrations vary among the most common forms of cannabis:

- **Marijuana (dried flowering tops and leaves)- 0.5%-14% THC concentration**
- **Hashish (dried cannabis resin and compressed flowers)- 2% to 8%**
- **Hash oil (THC extracted from hashish with organic solvent)- 15% to 50%**

Kinetics

- **Marijuana “cigarette” (joint)**
- **Water pipe (bong)**
- **Orally via food products (brownies, etc.)**

Therapeutic and Proposed Indications Cannabinoid Use

- **Antiemetic effect**
- **Appetite stimulation**
- **Anticonvulsant effect**
- **Neurologic and Movement disorders**
- **Analgesia**
- **Glaucoma**

Psychomotor Effects of Cannabis Use

- **Distorted vision**
- **Slowed reaction time and information processing**
- **Impaired short term memory, attention, signal detection, and slowed time perception**
- **Impaired perceptual motor coordination and motor performance**
- **Additive effect of marijuana and alcohol on performance tasks such as driving.**

Behavioral and Cognitive effects

Marijuana use associated with:

- **“Amotivational syndrome” - limited evidence to support it**
- **Mild decreases in concentration, short term memory, attention, and integration of complex information.**

Cannabis-Related Disorders in the DSM-5:

- 1. Cannabis Intoxication**
- 2. Cannabis Use Disorder**
- 3. Cannabis Withdrawal**
- 4. Other Cannabis-Induced Disorders**
- 5. Unspecified Cannabis-Related Disorder**

Cannabis Use Disorder

DSM-5 Diagnostic Criteria

A problematic pattern of cannabis use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:

- 1. Cannabis is often taken in larger amounts or over a longer period than was intended.**
- 2. There is a persistent desire or unsuccessful efforts to cut down or control cannabis use.**
- 3. A great deal of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects.**
- 4. Craving, or a strong desire or urge to use cannabis.**

DSM-5 Criteria for Cannabis Use Disorder (continued)

5. Recurrent cannabis use resulting in a failure to fulfill major role obligations at work, school, or home.
6. Continued cannabis use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis.
7. Important social, occupational, or recreational activities are given up or reduced because of cannabis use.
8. Recurrent cannabis use in situations in which it is physically hazardous.
9. Cannabis use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis.

DSM-5 Criteria for Cannabis Use Disorder (continued)

10. Tolerance, as defined by either of the following:
 - a. A need for markedly increased amounts of cannabis to achieve intoxication or desired effect.
 - b. A markedly diminished effect with continued use of the same amount of cannabis.
11. Withdrawal, as manifested by either of the following:
 - a. The characteristic withdrawal syndrome for cannabis
 - b. Cannabis (or a closely related substance, such as a benzodiazepine) is taken to relieve or avoid withdrawal symptoms.

Core Features of Cannabis Use Disorder

- **Criteria are grouped according to similar symptoms:**
 - **Criteria 1-4: Impaired control**
 - **Criteria 5-7: Social impairment**
 - **Criteria 8-9: Risky use**
 - **Criteria 10-11: Pharmacological criteria**
- **Criteria does not include parameters regarding amount, frequency, or pattern of use**

Cannabis Use Disorder

- **Severity**
 - **Mild- presence of 2-3 symptoms**
 - **Moderate- presence of 4-5 symptoms**
 - **Severe- presence of 6 or more symptoms**
- **Specify if:**
 - **In early remission (3-12 months w/o symptoms, with the exception of craving)**
 - **In sustained remission (more than 12 months)**
 - **In a controlled environment**

Cannabis Intoxication

DSM-5 criteria

A. Recent use of cannabis

B. Clinically significant problematic behavioral or psychological changes (e.g., impaired motor coordination, euphoria, anxiety, sensation of slowed time, impaired judgment, social withdrawal) that developed during, or shortly after cannabis use.

C. Two (or more) of the following signs or symptoms developing within 2 hours of cannabis use:

- 1. Conjunctival injection.**
- 2. Increased appetite**
- 3. Dry mouth**

Cannabis Intoxication

C. Two (or more) of the following signs or symptoms developing within 2 hours of cannabis use:

- 1. Conjunctival injection.**
- 2. Increased appetite.**
- 3. Dry mouth.**
- 4. Tachycardia**

Cannabis Intoxication

D. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication with another substance.

Specify if:

With perceptual disturbances: Hallucinations with intact reality testing or auditory, visual, or tactile hallucinations occur in the absence of delirium.

Cannabis Intoxication

- **Management**
 - Often can be managed without medication
 - Patient should be kept in a quiet environment and offered supportive reassurance.
 - For severe agitation or anxiety, shorter acting benzodiazepines are preferred.
 - Low dose SGAs shown to be helpful for psychosis.

Cannabis Withdrawal

DSM-5 criteria

A. Cessation of cannabis use that has been heavy and prolonged (i.e., usually daily or almost daily use over a period of at least a few months).

Cannabis Withdrawal

B. Three (or more) of the following signs develop within 1 week after Criterion A:

- 1. Irritability, anger, aggression.**
- 2. Nervousness or anxiety.**
- 3. Sleep difficulty (e.g., insomnia, disturbing dreams).**
- 4. Decreased appetite or weight loss.**
- 5. Restlessness.**
- 6. Depressed mood.**
- 7. At least one of the following physical symptoms causing significant discomfort: abdominal pain, shakiness/tremors, sweating, fever, chills, or headache.**

Cannabis Withdrawal

- C. The signs or symptoms in Criterion B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication or withdrawal with another substance.

Cannabis Withdrawal

- More common symptoms:
 - Irritability, anxiety, depression, restlessness, anorexia, insomnia, vivid dreams
- Less common symptoms:
 - GI distress, chills, nausea, diaphoresis, muscle twitches
- Management:
 - Rarely requires treatment. No medication shown to be regularly effective.
 - Drobinol

Psychopathology

- **Cannabis use is associated with a nearly threefold increased risk of psychotic illnesses**
- **Numerous large prospective, longitudinal studies suggests that the use of cannabis:**
 - **increases the risk for schizophrenia**
 - **Worsens symptoms and prognosis**
- **Persons with genetic vulnerability or cannabis use very early in adolescence are particularly prone to the development of a psychotic disorder**

Cannabis Effects on Major Organ Systems

- **Respiratory**
- **Cardiovascular**
- **Liver**
- **Endocrine**
- **Reproductive**

Screening for Substance Use in General

- **Ask your patients about their substance use:**
 - Ask about nicotine, alcohol, and each of the common illicit drugs specifically.**
- **Try to start with the least charged topics first to get them more comfortable**
- **Discuss without criticism or judgment**
- **Follow up on positive responses**

Other Tools Available

- **More detailed screening tools:**
 - **The Drug Abuse Screening Test**
 - **The Severity of Dependence Scale**
- **Cannabis Dependence is approximately equivalent to Cannabis Use Disorder, moderate to severe subtype**
- **Cannabis Abuse is similar to the mild subtype**

Drug Testing

- Urine, blood, oral fluid, and hair can all be tested for cannabinoid metabolites.
- Urine testing is most cost effective, however very vulnerable to cheating.

Drug Testing

- Positive UDS only indicates cannabis past use
- Cannabinoid metabolites
 - highly lipophilic and excreted very slowly
- UDS can remain positive for:
 - 7 to 10 days for casual users
 - Two to four weeks for heavy users
 - Months for chronic heavy users

Cannabis Use Disorder Management

- **Psychosocial intervention should be the 1st line treatment for patients seeking help.**
- **At a minimum, start addiction counseling to focus on:**
 - **Enhancing motivation to stop use, improve social skills and interpersonal functioning, manage potential emotional triggers, education about consequences of cannabis use.**
- **Adjunct treatment via participation in peer support groups such as Marijuana Anonymous has shown to be effective as well.**

Psychosocial Interventions

- **Cognitive Behavioral Therapy (CBT)**
- **Motivational Interviewing**
- **Voucher Based Incentives**
- **Peer Support Groups**
- **Family Therapy**

Synthetic Cannabinoids

- **Analogs of natural cannabinoids that are chemically synthesized**
- **Available in Europe in 2004, first reported in the US in 2008**
- **Usually added to herbs or other plants to appear as natural product**
- **Marketed as “incense” or “herbal remedies”**

Synthetic Cannabinoids

- **Sold under various names, the most popular being K2, and Spice.**
- **Other names: crazy monkey, chill out, spice diamond, spice gold, chill X**
- **Up to 7000 cases of toxicity reported annually to US poison control centers, some with severe symptoms requiring emergency care that are sometimes fatal.**

Synthetic Cannabinoids

- **Typical users are young males in their 20s-30s**
- **Rapid urine tests will NOT detect synthetic cannabinoids**
- **Diagnosis of intoxication via history gathering and physical findings**
- **Supportive management for mild-moderate intoxication**
- **Severe intoxication can be life threatening and warrants prompt treatment directed at the most significant findings.**

Legalization

- **Alaska, Colorado, Oregon, Washington, and the District of Columbia have all legalized small amounts of marijuana for adult recreational use.**
- **In November 2015, Ohio voters defeated Issue 3 on the ballot, which addressed commercial production and sale of recreational marijuana.**

Decriminalization

- Twenty states, including Ohio, and the District of Columbia have decriminalized small amounts of marijuana.
- Of those, six—Minnesota, Missouri, Nevada, North Carolina, Ohio—have it as a low-level misdemeanor, with no possibility of jail for qualifying offenses.
- The other states with decriminalization policy have specified small amounts of marijuana as a civil infraction or similar.

Summary

- Cannabis is the most commonly used illegal substance in the world.
- The psychoactive properties of cannabis are primarily due to *delta-9-tetrahydrocannabinol* (THC). Easily detected via urine drug screen.
- Patients with cannabis use disorder often use other substances, especially alcohol, tobacco, and cocaine.
- Comorbid Anxiety and Mood disorders frequently occur.

Summary

- **Treatment/management of acute intoxication and withdrawal is largely supportive**
- **Psychosocial intervention should be the 1st line treatment for patients seeking help.**
- **Synthetic Cannabinoid intoxication, if severe, can be life threatening and should be managed accordingly.**
- **For many states, cannabis legalization is a hot political topic and the outcomes are still to be determined.**

Citations

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Wilson N, et al. *Comorbid mood, psychosis, and marijuana abuse disorders: A theoretical review*. *J Addict Dis*. 2009 Oct; 28(4): 309–319.

American Society of Addiction Medicine. (2014). *The ASAM Principles of Addiction Medicine* (5th ed.). Philadelphia, PA: Wolters Kluwer Health Publishing.

American Society of Addiction Medicine. (2009). *The ASAM Principles of Addiction Medicine* (4th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Macmillan Reference USA. (2009). *Encyclopedia of Drugs, Alcohol, & Addictive Behavior* (3rd ed.) Pamela Korsmeyer and Henry R. Kranzler, Editors in Chief

Bailey JA, Cannabis use disorder: Epidemiology, comorbidity, and pathogenesis. In: UpToDate, Saxon AJ (Ed), UpToDate, Waltham, MA. (Accessed on March 23rd, 2016)

Wang GS, Synthetic cannabinoids: Acute intoxication. In: UpToDate, Burns MM, et al. (Ed), UpToDate, Waltham, MA. (Accessed on March 23rd, 2016)

Marijuana Overview, Legalization. (2016, April). Retrieved from <http://www.ncsl.org/research/civil-and-criminal-justice/marijuana-overview.aspx>