

Marijuana and the Impact on Mental Health



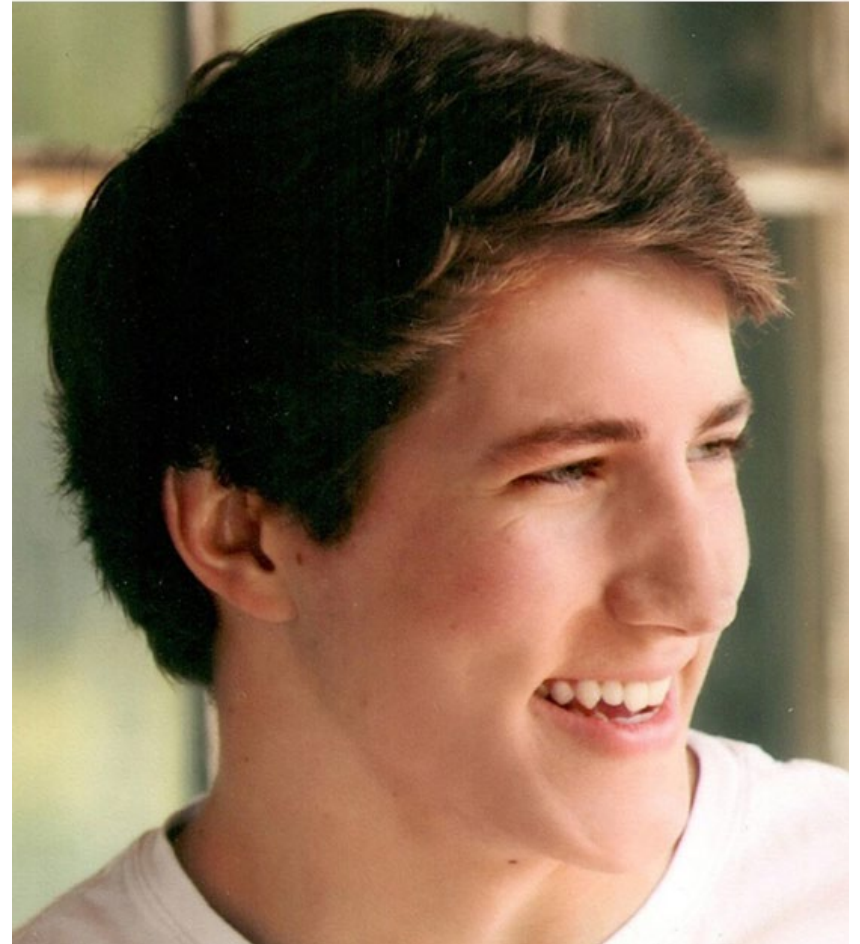
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Outline

- Johnny's story
- Marijuana
 - Effects on brain and body
 - Trends in use
- Current evidence
 - Potential therapeutic benefits
 - Risks to mental health
- Ohio's medical marijuana policy
- Staying informed
 - Talking with medical professionals
 - Knowing available resources

Johnny's Story

- <https://johnnysambassadors.org/a-public-service-announcement-about-high-thc-pot/>
- *Eternal Leadership: The Dangerous Truth About Today's Marijuana Podcast*



What is Marijuana?



- Dried leaves, flowers, stems, and seeds from the plant *Cannabis sativa* or *Cannabis indica*
- Complex plant, hundreds of cannabinoids including
 - THC (tetrahydrocannabinol)– main psychoactive or mind-altering component
 - CBD (cannabidiol)– purported to have health benefits
- Extracts can also be made from the plant

<https://nida.nih.gov/drug-topics/cannabis-marijuana>

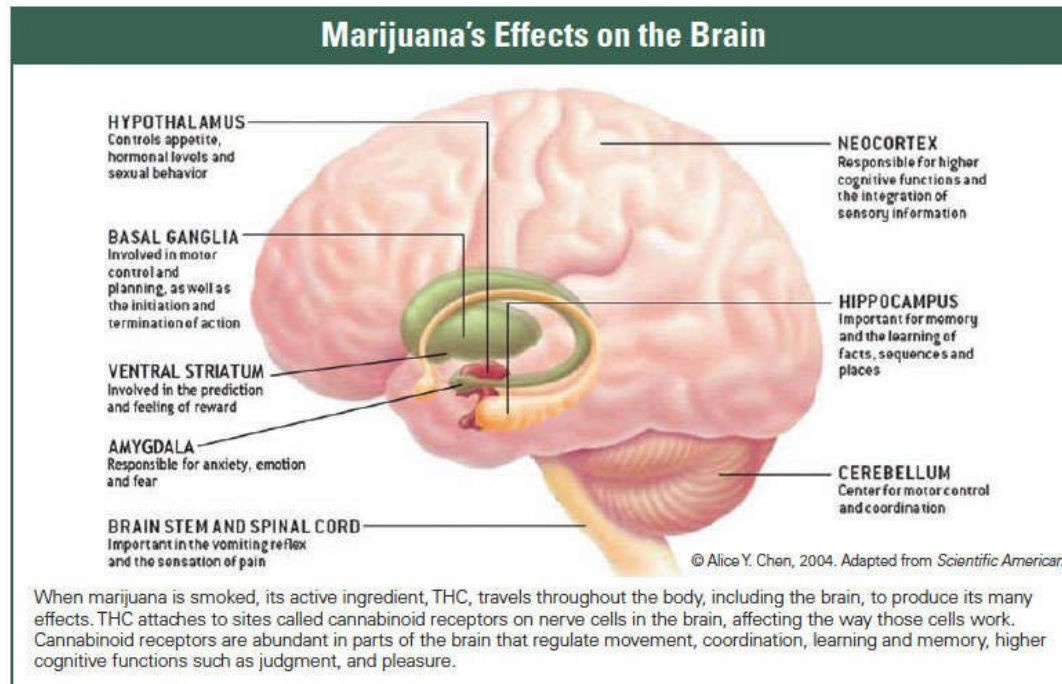
How Marijuana is Used



- Smoking
 - Hand rolled cigarettes (“joint”)
 - Pipes or water pipes (“bong”)
 - (Partially) empty cigars filled with marijuana (“blunt”)
- Vaporized
- Food products (“edibles”)
 - Brownies, cookies, candy, tea
- Smoking or vaping marijuana extracts (“dabbing”)
 - THC-rich resins
 - Concentrated marijuana and butane solvent
 - Wax, budder, hash oil, shatter

<https://nida.nih.gov/publications/drugfacts/cannabis-marijuana>

Marijuana's effects on central nervous system



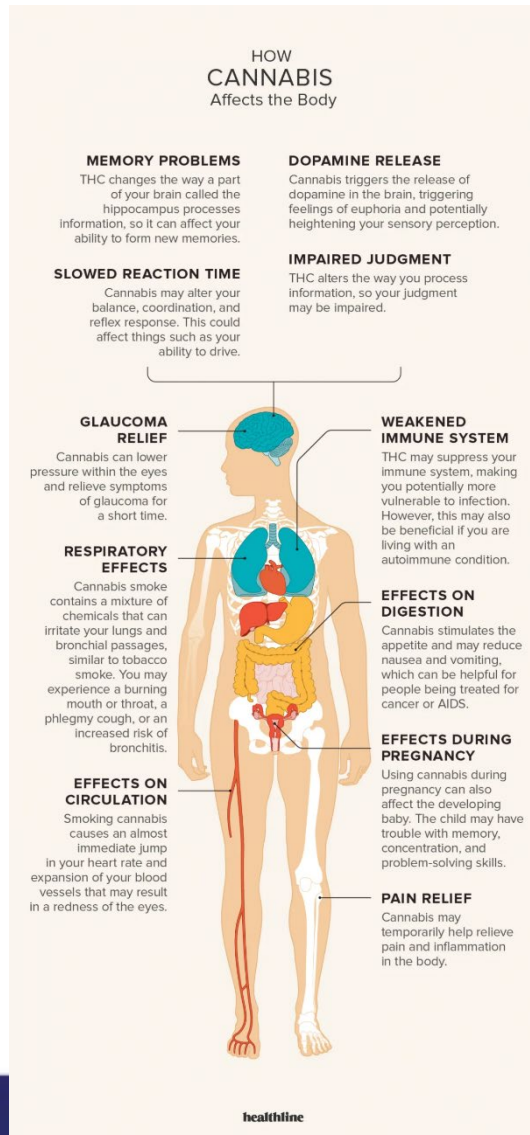
Picture: <https://teens.drugabuse.gov/drug-facts/marijuana>

- Acts on the endocannabinoid system, composed of natural cannabinoids (including anandamide) and cannabinoid receptors present throughout brain and spinal cord

Marijuana's effects cont'd

- THC activates CB1 and CB2 receptors
 - reducing neurotransmission, which is associated with impairments in learning, memory, spatial orientation, and attention and physiologic effects including elevated HR
 - produces euphoria and can produce psychosis; may have analgesic and anti-inflammatory properties
- CBD binds weakly to CB1 and decreases effects of CB2
 - thought to produce pain relief and possibly anti-anxiety; low likelihood for intoxication
- CBD thought to lessen psychoactive effects of THC, so ratio is important

Marijuana: Physiologic Response



Short term effects:

elevated HR, low BP, dry mouth and dry eyes, euphoria, psychosis, increased anxiety altered sense of time, impaired memory and cognition, reduced motor coordination and judgement, increased appetite, anti-nausea properties, pain relief, anti-spasticity

CBD may cause somnolence, diarrhea, fatigue, lack of appetite, pain relief

Virtually no risk for respiratory depression or fatal overdose

Picture: <https://www.healthline.com/health/effects-of-cannabis-on-body>

Marijuana: Physiologic Response

- Long term effects:
 - Affects brain development
 - may impair thinking, memory, and learning functions and affect how the brain builds connections between areas necessary for these function
 - Lower IQ in individuals who smoke marijuana heavily starting in their teen years (lasting into adulthood)
 - Risk for low birth weight, resp problems, cognitive effects when exposed in utero
 - Risk for addiction

Marijuana: Then and Now

- DEA confiscated samples of marijuana were analyzed from 1995 to 2014 (38,681 samples)
- Increased potency of THC and decreased potency of CBD

| | 1995 | 2014 |
|----------|-------------|-------|
| THC | 4% | 12% |
| CBD | 0.5% (2004) | <0.2% |
| THC: CBD | 15 | 80 |

EISohly et al. 2016

*THC concentrates: “dabbing” may have up to 40-80% THC

Marijuana: Then and Now

Trends in Prevalence rates of Marijuana Use in ages 12-25 y/o in US



Yu et al. 2020

Medical Indications for Marijuana

- FDA-approved cannabis-related meds:
 - Dronabinol, Nabilone (synthetic THC)
 - Approved for chemotherapy-related nausea/vomiting and appetite stimulation in patients with cancer and HIV
 - Epidolex (contains CBD)
 - Approved for rare childhood seizure disorders– Dravet Syndrome and Lennox Gestaut Syndrome
 - Rigorously studied
- “Medical” Marijuana is illicit federally (DEA schedule I)
 - lack of high quality RCTs in humans, small sample sizes, difficulty in standardizing across studies
 - Medical marijuana is unstandardized

Evidence for therapeutic benefit of MJ

(summarized from Levinsohn and Hill review, 2020)

- **High quality, modest evidence to treat** (Torres-Moreno, 2018 meta-analysis of 17 RCTs)
 - spasticity, chronic pain, & bladder dysfunction in MS patients
- **Moderate quality evidence** (Whiting et al., 2015 systematic review and meta-analysis of 79 RCTs)
 - Neuropathic pain, cancer pain
- **Equivocal, low, or weak evidence** (Nugent et al., 2017 meta-analysis of 27 studies; 2019 review)
 - Chronic pain, anxiety disorders with other medical conditions (chronic non cancer pain and MS)
- **Poor evidence** (American Academy of Ophthalmology, 2014)
 - glaucoma
- **No evidence** (Black et al., 2019 systematic review and metanalysis of 83 studies)
 - PTSD, ADHD, psychosis

Evidence for therapeutic benefit of CBD

(summarized from Levinsohn and Hill review, 2020)

- Preliminary findings suggest
 - Anti-inflammatory, antioxidant, antiapoptotic, neuroprotective, analgesic, oncolytic, immunomodulatory effects
 - CBD may counteract psychogenic properties of THC (and possibly treat psychosis?)
 - supported by preclinical and neuroimaging studies
 - Mixed data from RCTs, may reflect dosing and stage of schizophrenia in studies
- Associated with lower anxiety in patients with social anxiety (Bergamaschi et al., 2011)
- Inconsistent evidence that CBD can be used to treat cannabis withdrawal
- Neuroprotective
 - Decreases neuroinflammation and promotes neuronal survival
 - Mixed and limited evidence for treating Alzheimer's, Parkinson's, and Huntington's Diseases
- IBD (Naftali et al., 2017)
 - Evidence in animal but not human studies

Risks to Mental Health

Marijuana:

- Regular/heavy use is associated with increased risk and worsening of depression and anxiety
- Higher doses may be associated with psychosis and paranoia
- Increased risk for developing schizophrenia in those vulnerable
- Lower life satisfaction
- Impaired neural connectivity in prenatal and adolescent exposure
 - Decline in IQ in those with early, regular use
- Risk for substance use disorder
 - Evidence of physiologic dependence and tolerance
 - Documented withdrawal syndrome in 1/3 of chronic users
 - Anxiety, irritability, craving, dysphoria, and insomnia
 - Problems in work, school, and relationships (occurs in 8% of adults and 17% of adolescents who use)
 - Predicts future abuse of illicit substances



CBD

- May affect medication metabolism/cause drug interactions with certain meds
- No evidence of dependence or tolerance

Risks to Young Adults/Teens

- A recent study showed earlier use of all substances including cannabis was associated with increased risk for developing a substance use disorder later in life
- Younger onset of marijuana use is associated with lower overall neurocognitive functioning (IQ and executive functioning)
- Youth who use marijuana may be more likely to engage in other risky behaviors such as using other substances and driving after use
- High concentrate use (gaining popularity) has higher risk for adverse effects such as increase anxiety and risks for psychosis



Picture: <https://www.shutterstock.com/search/teen>

Other risks associated with marijuana use

- Acute intoxication doubles risk of MVA
- Cannabis hyperemesis syndrome
- Chronic cannabis smokers show
 - Higher risk for developing chronic bronchitis
 - Mildly increased risk for heart attack
 - Moderately increased risk for testicular cancer

Ohio's Medical Marijuana Control Program



<https://www.medicalmarijuana.ohio.gov/>

Despite variability in evidence, state policies have approved medical marijuana for many different medical issues

- [WHAT ARE THE QUALIFYING MEDICAL CONDITIONS THAT MAY BE TREATED WITH MEDICAL MARIJUANA?](#)
- Certified physicians may recommend medical marijuana only for the treatment of a qualifying medical condition. Under Ohio law, qualifying medical conditions include all of the following: **AIDS, amyotrophic lateral sclerosis, Alzheimer's disease, cachexia, cancer, chronic traumatic encephalopathy, Crohn's disease, epilepsy or another seizure disorder, fibromyalgia, glaucoma, hepatitis C, Huntington's disease, inflammatory bowel disease, multiple sclerosis, pain that is either chronic and severe or intractable, Parkinson's disease, positive status for HIV, post-traumatic stress disorder, sickle cell anemia, Spasticity, spinal cord disease or injury, terminal illness, Tourette syndrome, traumatic brain injury, and ulcerative colitis.**
- In February 2021, the State Medical Board of Ohio determined the following conditions are considered covered by an existing qualifying condition: **arthritis, chronic migraines, and complex region pain syndrome.**



When considering the use of marijuana

- Talk with your doctor about
 - Current evidence supporting use for particular ailment
 - Acute and chronic risks of use
 - Individualized considerations
 - risks for addiction and exacerbating mental health and physical health problems
 - Heightened risk in adolescent/young adults
- Beware of problematic use/addiction risk and how to get help if this occurs

Helpful Resources to Stay Informed

- <https://teens.drugabuse.gov/>
- <https://www.justthinktwice.gov/>
- <https://johnnysambassadors.org/>
- <https://nida.nih.gov/drug-topics/cannabis-marijuana>

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Summary

- Legalization of marijuana is expanding across the US and impacting the public's perception of its safety and potential uses
- Important to understand both the adverse health effects and the potential therapeutic benefits linked to marijuana.
- Limited evidence for therapeutic benefit to many conditions
- CBD may have more health benefits with less side effects but there are some concerns for med interactions and there remains insufficient high-quality data
- Known risks to mental health include triggering and exacerbating depression and psychosis, impacting IQ, leading to/exacerbating substance use disorder(s)
- Risk to young adults due to impacts on the developing brain
- If considering or engaging in use, talk with our medical providers to seek out evidence-based data to support your decision

Resources

Hill, KP. Medical marijuana for treatment of chronic pain and other medical and psychiatric problems A clinical review. *JAMA*. 2015; 313(24): 2474-2483.

Levinsohn, EA & Hill, KP. Clinical uses of cannabid and cannabinoids in the United States. *Journal of Neurological Sciences*. 2020; 411(2020): 1-6.

ElSohly, MA et al. Changes in Cannabis Potency over the Last Two Decades (1995-2014) - Analysis of Current Data in the United States. *Biological psychiatry*. 2016; 79(7), 613–619.

Yu, B., Chen, X., Chen, X. *et al.* Marijuana legalization and historical trends in marijuana use among US residents aged 12–25: results from the 1979–2016 National Survey on drug use and health. *BMC Public Health* **20**, 156 (2020).

<https://nida.nih.gov/publications/drugfacts/cannabis-marijuana>