

## **MEDICAL MARIJUANA NEGATIVE SIDE EFFECTS**

Before a drug is used as a medicine there should be an analysis to see if the negative side effects are outweighed by the benefits of the drug. Approximately 40 to 60% of people who use marijuana report unpleasant side effects. The Institute of Medicine (IOM) states that marijuana a "powerful drug with a variety of effects." <sup>1</sup>

### **A Rise in Marijuana's THC Levels**

The amount of THC in marijuana has been increasing steadily over the past few decades. For a person who's new (naive) to marijuana use, this may mean exposure to higher THC levels with a greater chance of a harmful reaction. Higher THC levels may explain the rise in emergency room visits involving marijuana use. The popularity of edibles also increases the chance of harmful reactions. Edibles take longer to digest and produce a high. Therefore, people may consume more to feel the effects faster, leading to dangerous results. Higher THC levels may also mean a greater risk for addiction if people are regularly exposing themselves to high doses. <sup>2</sup>

THC acts on numerous areas in the brain and the body. The below facts are from the National Institute on Drug Abuse <sup>3</sup>

### **Short-Term Effects**

When a person smokes marijuana, THC quickly passes from the lungs into the bloodstream. The blood carries the chemical to the brain and other organs throughout the body. The body absorbs THC more slowly when the person eats or drinks it. In that case, they generally feel the effects after 30 minutes to 1 hour. THC acts on specific brain cell receptors that ordinarily react to natural THC-like chemicals. These natural chemicals play a role in normal brain development and function. Marijuana overactivates parts of the brain that contain the highest number of these receptors. This causes the "high" that people feel. Other effects include:

- altered senses (for example, seeing brighter colors)
- altered sense of time
- changes in mood
- impaired body movement
- difficulty with thinking and problem-solving
- impaired memory

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<sup>1</sup> "Medical Marijuana: Clinical Considerations and Concerns," Richard G. Soper, MD, [AZ Medicine](#), Summer 2011  
For complete reprints of the original article, contact Dr. Soper at the Center for Behavioral Wellness, 2830 Bransford Ave., Nashville, TN, 37204; phone: 615-292-5747, fax: 615-2925749; email: mdjd@justice.corn.

<sup>2</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

<sup>3</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

hallucinations (when taken in high doses)  
delusions (when taken in high doses)  
psychosis (when taken in high doses)

## **Long-Term Effects**

When people begin using marijuana as teenagers, the drug may impair:

thinking  
memory  
learning functions  
how the brain builds connections between the areas necessary for these functions.

### Loss of IQ

A study from New Zealand conducted in part by researchers at Duke University showed that people who started smoking marijuana heavily in their teens and had an ongoing marijuana use disorder lost an average of 8 IQ points between ages 13 and 38. The lost mental abilities didn't fully return in those who quit marijuana as adults.

Marijuana use may have a wide range of effects, both physical and mental <sup>4</sup>

### Physical Effects

Breathing problems. Marijuana smoke irritates the lungs, and people who smoke marijuana frequently can have the same breathing problems as those who smoke tobacco. These problems include daily cough and phlegm, more frequent lung illness, and a higher risk of lung infections. Increased heart rate. Marijuana raises heart rate for up to 3 hours after smoking. This effect may increase the chance of heart attack. Older people and those with heart problems may be at higher risk.

### Mental Effects

Long-term marijuana use has been linked to mental illness in some people, such as:

temporary hallucinations  
temporary paranoia  
worsening symptoms in patients with schizophrenia—a severe mental disorder with symptoms such as hallucinations, paranoia, and disorganized thinking

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<sup>4</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

Marijuana use has also been linked to other mental health problems, such as depression, anxiety, and suicidal thoughts among teens.

#### How Does Marijuana Affect a Person's Life? <sup>5</sup>

Compared to those who don't use marijuana, those who frequently use large amounts report the following:

- lower life satisfaction
- poorer mental health
- poorer physical health
- more relationship problems

People also report less academic and career success. Use of marijuana eliminates a large portion of jobs available such as physicians, pilots, commercial drivers, etc. Marijuana use is also linked to a higher likelihood of dropping out of school. It's also linked to more job absences, accidents, and injuries.

#### **Can a person overdose on marijuana?**

An overdose occurs when a person uses enough of the drug to produce life-threatening symptoms or death. There are no reports of teens or adults dying from marijuana alone. However, the person who does overdose can die from the side effects of overdose such as vomiting, aspiration and accidental deaths due to intoxication. Some people who use marijuana can feel some very uncomfortable side effects, especially when using marijuana products with high THC levels. People have reported symptoms such as anxiety and paranoia, and in rare cases, an extreme psychotic reaction (which can include delusions and hallucinations) that can lead them to seek treatment in an emergency room. While a psychotic reaction can occur following any method of use, emergency room responders have seen an increasing number of cases involving marijuana edibles. Some people (especially preteens and teens) who know very little about edibles don't realize that it takes longer for the body to feel marijuana's effects when eaten rather than smoked. So they consume more of the edible, trying to get high faster or thinking they haven't taken enough. In addition, some babies and toddlers have been seriously ill after ingesting marijuana or marijuana edibles left around the house.<sup>6</sup>

#### Teens

According to Dr. Claire McCarthy, MD, Faculty Editor, Harvard Health Publishing, marijuana can:

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<sup>5</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

<sup>6</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

1. impair short-term memory, concentration, attention span, and problem-solving.
2. lead to damage to lungs from inhaling the smoke
3. increase risks of long-term psychiatric problems such as depression or psychosis
4. increase risk of long-term problems with memory and executive function, even after use of marijuana has ceased.
5. cause addiction - 9% of those who use will become addicted. 17% for those who start in adolescence and 25% to 50% in teens who smoke marijuana daily.
6. cause growth and learning problems in babies whose mothers smoke during pregnancy.
7. cause damage in teens whose brains are still developing.
8. Health problems because the smoke of marijuana is toxic to the person smoking it and the people around them. <sup>7</sup>

**Additional adverse side effects of marijuana use are many and include: <sup>8</sup>**

1. Disruptive effect on coordination beyond the period of intoxication which cause increased risk for adverse incidents such as motor vehicle crashes, industrial accidents.

2. Physical Adverse Effects include:

- Altered body temperature
- Altered pulmonary status
- Decreased coordination
- Decreased cerebral blood flow
- Dry mouth
- Headache
- Increased heart rate
- Increased food consumption
- Nausea
- Nystagmus (involuntary eye movement)
- Reduced muscle strength
- Tremor

3. Reproductive abnormalities

Abnormal ova

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<sup>7</sup> Parents: As more states legalize marijuana, here's what you need to know and do, Posted February 28, 2017, 10:30 AM , Updated March 03, 2017, 4:28 PM, Dr. Claire McCarthy, MD, Faculty Editor, Harvard Health Publishing

<sup>8</sup> Marijuana: Medical Implications, John R. Hubbard, M.D., Ph.d., Sharone E. Franco, M.d., and Emmanuel S. Onaivi, Ph.D., Vanderbilt University School of Medicine, Nashville, Tennessee, American Family Physician. 1999 Dec 1;60(9):2583-2588. <https://www.aafp.org/afp/1999/1201/p2583.html>

- Change in sperm morphology/motility
- Chromosomal damage
- Decreased libido
- Fetal exposure
- Gynecomastia
- Impotence
- Increase in the risk of nonlymphoblastic leukemia in children
- Infertility
- Lower testosterone levels
- Menstrual abnormalities
- Prolonged childbirth
- Reduced fertility in offspring
- Reduced testicular size
- Reduction of the size of the fetus and the birth weight

#### 4. Side effects on pre-existing medical conditions

- Impairment of pulmonary defenses against infection.
- Increase of cognitive deficits
- Increased risk of damage to coronary arteries cerebrovascular system
- Increased damage to already damaged airways - marijuana smoke has significantly higher tar content than tobacco and has carcinogens and is smoked unfiltered.

#### 5. Side effects caused by marijuana withdrawal

- Altered sleep/wake cycles
- Behavioral
- Decreased appetite
- Depressed mood
- Increased body temperature
- Insomnia
- Irritability
- Nausea
- Perspiration
- Physiologic
- Restlessness/agitation
- Salivation
- Sleep
- Tremor
- Weight loss
- Cravings<sup>9</sup>

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<sup>9</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

## 6. Neuropsychiatric Side Effects

- Addictive behaviors
- Aggressiveness
- Altered libido
- Amotivational syndrome
- Anxiety and panic
- Confusion
- Depersonalization
- Derealization
- Hallucinations
- Paranoia
- Poor sense of time
- Possible suicidal ideation
- Sedation
- Worsened short-term memory

The neurological disadvantages to using marijuana include:

1. Problems in the domains of attention and memory that persist beyond abstinence
2. Macrostructural brain alterations such as morphometry changes in gray matter tissue and changes in white matter tract integrity such as poorer coherence in white matter fibers.
3. Abnormalities of neural functioning such as increased brain activation
4. Changes in neurovascular functioning.<sup>10</sup>

There are neurocognitive disadvantages to using marijuana in the domains of attention and memory that persist beyond abstinence.<sup>11</sup>

### **Other side effects**

Cannabinoids are known to have biphasic effects in that a lower dose may relieve a symptom but a higher dose may make it worse and people vary widely in their response to marijuana and this has not been studied with marijuana. How marijuana is delivered may also affect both the efficacy of its use and number of side effects. Marijuana dispensaries deliver it in elixirs, honeys, baked goods, candies and beverages but there is no reliable data to indicate if these preparations are more efficacious and/or better tolerated. People with chronic medical conditions, the elderly

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<sup>10</sup> Is CBD Oil Harmful or Healing? What No One is Telling You  
<https://www.thehealthyhomeeconomist.com/cbd-oil-dangers/#comment-643247>

<sup>11</sup> Is CBD Oil Harmful or Healing? What No One is Telling You  
<https://www.thehealthyhomeeconomist.com/cbd-oil-dangers/#comment-643247>

patients and those who are not experienced with marijuana may be more sensitive to side effects. There are also gender differences in response.<sup>12</sup>

**Acute effects of pure THC and high-THC marijuana include:**

- Abuse and dependency
- Anxiety (including panic attacks),
- Cognitive impairment
- Confusion
- Dizziness,
- Dry mouth
- Hallucinations and other psychotic-like symptoms
- Intoxication (including dysphoria)
- Orthostatic hypotension
- Psychomotor impairment
- Somnolence,
- Tachycardia<sup>13</sup>

The Journal of the American Medical Association (JAMA) released an article on cannabinoids for medical use that claimed that there was an increased risk of short-term adverse effects including some serious adverse effects. The most common adverse effects included:

- asthenia
- balance problems
- confusion
- dizziness
- disorientation
- diarrhea
- euphoria
- drowsiness
- dry mouth
- fatigue
- hallucination
- nausea
- somnolence

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<sup>12</sup> “Medical Marijuana: Clinical Considerations and Concerns,” Richard G. Soper, MD, AZ Medicine, Summer 2011 For complete reprints of the original article, contact Dr. Soper at the Center for Behavioral Wellness, 2830 Bransford Ave., Nashville, TN, 37204; phone: 615-292-5747, fax: 615-2925749; email: mdjd@justice.com.

<sup>13</sup> “Medical Marijuana: Clinical Considerations and Concerns,” Richard G. Soper, MD, AZ Medicine, Summer 2011 For complete reprints of the original article, contact Dr. Soper at the Center for Behavioral Wellness, 2830 Bransford Ave., Nashville, TN, 37204; phone: 615-292-5747, fax: 615-2925749; email: mdjd@justice.com.

vomiting.<sup>14</sup>

## **Are People with Health and Age-Related Problems More Vulnerable to Marijuana's Risks?**

State-approved medicinal use of marijuana is a fairly new practice. For that reason, marijuana's effects on people who are weakened because of age or illness are still relatively unknown. Older people and those suffering from diseases such as cancer or AIDS could be more vulnerable to the drug's harmful effects, but more research is needed.<sup>15</sup>

### **Cancer**

Marijuana use is associated with cancer. Marijuana contains 50% more carcinogens than tobacco smoke and marijuana smokers report serious symptoms of chronic bronchitis and other respiratory illnesses.<sup>16</sup> The risk for lung cancer may not appear to be consistently increased by marijuana use, however, three independent studies have shown that the risk for testicular cancer is doubled by regular use.<sup>17</sup> Marijuana smoke is associated with lung disease and the development of some cancers. High levels of the cannabinoid receptor that is preferentially activated by THC (CB1) correspond to shorter survival in many cancers.<sup>18</sup>

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<sup>14</sup> <http://jamanetwork.com/journals/jama/fullarticle/2338251>

<sup>15</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana-medicine>

<sup>16</sup> <https://learnaboutsam.org/science>

<sup>17</sup> Cancer

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#### **Testicular Cancer**

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## The National Cancer Institute and the FDA

NCI states that “At present, there is insufficient evidence to recommend inhaling Cannabis as a treatment for cancer-related symptoms or cancer treatment–related symptoms or cancer treatment-related side effects; however, additional research is needed.”<sup>19</sup> The U.S. Food and Drug Administration has not approved marijuana as a treatment for cancer.<sup>20</sup>

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Marijuana Smokers Face Rapid Lung Destruction - As Much as 20 Years Ahead of Tobacco Smokers, *Science Daily*, January 27, 2008

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<sup>19</sup> PDQ® Integrative, Alternative, and Complementary Therapies Editorial Board. PDQ Cannabis and Cannabinoids. Bethesda, MD: National Cancer Institute. <https://www.cancer.gov/about-cancer/treatment/cam/hp/cannabis-pdq> Accessed August 13, 2018

<sup>20</sup> PDQ® Integrative, Alternative, and Complementary Therapies Editorial Board. PDQ Cannabis and Cannabinoids. Bethesda, MD: National Cancer Institute. <https://www.cancer.gov/about-cancer/treatment/cam/hp/cannabis-pdq> Accessed August 13, 2018

## **Marijuana smoke causes cancer**

A comprehensive study of the dangers of marijuana smoke by the Hazard Assessment Branch Office of Environmental Health Hazard Assessment, California Environmental Protection Agency concluded that:

There is evidence from some epidemiological studies of marijuana smoke suggestive of increased cancer risk from both direct and parental marijuana smoking. However, this evidence is limited by validity issues and small numbers of studies for most types of cancer.

Direct marijuana smoking has been statistically significantly associated with cancer of the lung, head and neck, bladder, brain, and testis.

Parental marijuana smoking before or during gestation has been statistically significantly associated with childhood cancer. Childhood cancers that have been associated with maternal marijuana smoking are acute myeloid leukemia, neuroblastoma, and rhabdomyosarcoma. Childhood cancers that have been associated with paternal marijuana smoking are leukemia (all types), infant leukemia (all types), acute lymphoblastic leukemia, acute myeloid leukemia, and rhabdomyosarcoma.

In animal studies, increases in squamous cell papilloma of the skin were reported in mice exposed dermally to marijuana smoke condensate. Malignant mesenchymatous tumors were reported following six subcutaneous injections of marijuana smoke condensate to newborn rats. In a marijuana smoke inhalation study in female rats, benign tumors of the ovary and benign and malignant tumors of the uterus were observed.

There is evidence that marijuana smoke is genotoxic, immunosuppressive, and can alter endocrine function. Studies of 9-THC and other cannabinoids provide evidence for alterations of multiple cell signaling pathways, in endocrine function, and suppression of the innate and adaptive immune response. Prolonged exposures to marijuana smoke in animals and humans cause proliferative and inflammatory lesions in the lung.

Marijuana smoke and tobacco smoke share many characteristics with regard to chemical composition and toxicological activity.<sup>21</sup>

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<sup>21</sup> Evidence on the Carcinogenicity of Marijuana Smoke, August 2009, Reproductive and Cancer Hazard Assessment Branch Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, <https://oehha.ca.gov/media/downloads/proposition-65/chemicals/finalmjsmokehid.pdf>

## **What kind of cancer?**

The marijuana advocates claim that marijuana cures cancer. Some states permit its use to treat cancer but it is not limited to any form of cancer. Does this include any form of cancer including skin cancer? Does this include all treatments for cancer or only for chemotherapy? Does it include cancer in children? What about pregnant women who have cancer? Marijuana use by pregnant women can cause causes birth defects.

Marijuana use is now strongly connected to the onset of mental illness such as schizophrenia and depression. Do we want people with cancer to develop depression and other mental illness? The American Psychiatric Association states that current evidence supports, at minimum, a strong association of cannabis use with the onset of psychiatric disorders. "Adolescents are particularly vulnerable to harm, given the effects of cannabis on neurological development."<sup>22</sup>

There are many types of cancer and cancer treatments

There are over 160 types of cancer. Is marijuana good medicine for all cancers? For example, lets take a look at testicular cancer and an AIDS related cancer Kaposi Sarcoma.

### **Testicular cancer**

According to the American Cancer Society, researchers found a possible link between using marijuana and developing testicular cancer. The study showed that men who had testicular germ cell tumors were about twice as likely to report having ever used marijuana as men without these tumors.<sup>23</sup>

### **Kaposi Sarcoma**

A recent study from Harvard Medical School shows that marijuana use in any form opens the door for Kaposi's Sarcoma. This is a serious life threatening cancer for people with HIV infection. An unintended consequence of using marijuana oil is that it may harm people with HIV/AIDS.<sup>24</sup>

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<sup>22</sup> New APA Position Statement on Marijuana as Medicine, American Psychiatric Association, Date: November 18, 2013, <http://www.psychiatry.org/advocacy—newsroom/position-statements>.

<sup>23</sup> <http://www.cancer.org/cancer/news/study-links-marijuana-use-to-testicular-cancer>

<sup>24</sup> "Marijuana Component Opens The Door For Virus That Causes Kaposi's Sarcoma" Science Daily, 2 August 2007 <https://www.sciencedaily.com/releases/2007/08/070801112156.htm>

## Cardiac Disease

A major new study shows that smoking marijuana dramatically increases the risk of suffering a heart attack and other cardiovascular events. The study showed that over a 5-year period, regular users as young as in their early 30s were 4.6 times more likely to have a cardiac-related illness than those who did not smoke the drug. Even when they corrected for known risk factors, they still found a higher rate of both stroke and heart failure in those patients using marijuana.<sup>25</sup>

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<sup>25</sup> Pot Smoking Linked to Higher Stroke, Heart Risks: Study, 16 Mar 2018 09:55 AM  
<https://www.newsmax.com/health/health-news/pot-smoking-higher-stroke/2018/03/15/id/848861>

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There is an emerging literature on serious cardiac events being triggered by potent marijuana use in the young, including some fatalities. In addition, stroke, arrhythmias, and cardiomyopathies are serious outcomes of concern.<sup>26</sup>

### **Can marijuana use during and after pregnancy harm the baby or the mother?**

Some women report using marijuana to treat severe nausea associated with their pregnancy. Animal studies have shown that moderate concentrations of THC, when administered to mothers while pregnant or nursing, could have long-lasting effects on the child, including increasing stress responsivity and abnormal patterns of social interactions. Animal studies also show learning deficits in prenatally exposed individuals. Human research has shown that some babies

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<sup>26</sup> Cardiac events and fatalities

Jouanjus E, Lapeyre-Mestre M, Micallef J; French Association of the Regional Abuse and Dependence Monitoring Centres (CEIP-A) Working Group on Cannabis Complications\*. Cannabis use: signal of increasing risk of serious cardiovascular disorders. *J Am Heart Assoc.* 2014 Apr 23;3(2):e000638.

Hartung B, Kaufenstein S, Ritz-Timme S, Daldrup T. Sudden unexpected death under acute influence of cannabis. *Forensic Sci Int.* 2014;237:e11-13

#### Stroke

Singh NN, Pan Y, Muengtaweepansa S, Geller TJ, Cruz-Flores S. Cannabis-related stroke: case series and review of literature. *J Stroke Cerebrovasc Dis.* 2012;21(7):555-60.

#### Arrhythmias,

Goyal H, Awad HH, Ghali JK. Role of cannabis in cardiovascular disorders. *J Thorac Dis.* 2017;9(7):2079-2092.

#### Cardiomyopathies

Singh A, Saluja S, Kumar A, Agrawal S, Thind M, Nanda S, Shirani J. Cardiovascular Complications of Marijuana and Related Substances: A Review. *Cardiol Ther.* 2017 Dec 7. doi: 10.1007/s40119-017-0102-x. [Epub ahead of print]

born to women who used marijuana during their pregnancies display altered responses to visual stimuli, increased trembling, and a high-pitched cry, which could indicate problems with neurological development. In school, marijuana-exposed children are more likely to show gaps in problem-solving skills, memory, and the ability to remain attentive. Prenatal marijuana exposure is also associated with an increased likelihood of a person using marijuana as a young adult, even when other factors that influence drug use are considered. There is no human research connecting marijuana use to the chance of miscarriage, although animal studies indicate that the risk for miscarriage increases if marijuana is used early in pregnancy. Some associations have been found between marijuana use during pregnancy and future developmental and hyperactivity disorders in children.<sup>27</sup>

There have been significant increases over the last decade in the number of pregnant women seeking substance use disorder treatment for marijuana use. One study found that about 20% of pregnant women 24-years-old and younger screened positive for marijuana. However, this study also found that women were about twice as likely to screen positive for marijuana use via a drug test than they state in self-reported measures. This suggests that self-reported rates of marijuana use in pregnant females may not be an accurate measure of marijuana use. Research has shown that pregnant women who use marijuana have a 2.3 times greater risk of stillbirth. Additionally, in one study of dispensaries, nonmedical personnel at marijuana dispensaries were recommending marijuana to pregnant women for nausea, but medical experts warn against it.<sup>28</sup>

Given the potential of marijuana to negatively impact the developing brain, the American College of Obstetricians and Gynecologists recommends that obstetrician-gynecologists counsel women against using marijuana while trying to get pregnant, during pregnancy, and while they are breastfeeding.<sup>29</sup>

Some evidence shows that exposure to THC through breast milk in the first month of life could result in decreased motor development at 1 year of age. With regular use, THC can accumulate in human breast milk to high concentrations. Because a baby's brain is still forming, THC consumed in breast milk could affect brain development. Given all these uncertainties, nursing mothers are discouraged from using marijuana.<sup>30</sup>

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<sup>27</sup> <https://www.drugabuse.gov/publications/research-reports/marijuana/marijuana-safe-effective-medicine>

<sup>28</sup> <https://www.drugabuse.gov/publications/research-reports/marijuana/marijuana-safe-effective-medicine>

<sup>29</sup> <https://www.drugabuse.gov/publications/research-reports/marijuana/marijuana-safe-effective-medicine>

<sup>30</sup> <https://www.drugabuse.gov/publications/research-reports/marijuana/marijuana-safe-effective-medicine>

Problems with child development during and after pregnancy.

One study found that about 20% of pregnant women 24-years-old and younger screened positive for marijuana. However, this study also found that women were about twice as likely to screen positive for marijuana use via a drug test than they state in self-reported measures. This suggests that self-reported rates of marijuana use in pregnant females is not an accurate measure of marijuana use and may be underreporting their use. Marijuana use during pregnancy is linked to lower birth weight and increased risk of both brain and behavioral problems in babies. If a pregnant woman uses marijuana, the drug may affect certain developing parts of the fetus's brain. Children exposed to marijuana in the womb have an increased risk of problems with attention, memory, and problem-solving compared to unexposed children. Some research also suggests that moderate amounts of THC are excreted into the breast milk of nursing mothers. With regular use, THC can reach amounts in breast milk that could affect the baby's developing brain.<sup>31</sup>

Low birth weights

The Colorado School of Public Health reports that there is a 50% increase in low birth weights among women who use marijuana during pregnancy. Low birth weight sets the stage for future health problems including infection and time spent in neonatal intensive care.<sup>32</sup>

CBD During Pregnancy

Marijuana exposure crosses the placenta and human and animal studies found that prenatal cannabis exposure influences brain development and can have long-lasting impacts on cognitive functions. If CBD at least in part converts to THC under some conditions, women who ingest CBD for morning sickness or other pregnancy issues should understand that CBD use may mimic using marijuana directly.<sup>33</sup>

### **The side effects of second hand smoke or other marijuana exposure in children**

The metabolites in marijuana are detected in young children with exposure to secondhand marijuana smoke. The children who are exposed to the psychoactive compounds in marijuana are at risk for negative health effects. Understanding the negative health consequences of marijuana

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<sup>31</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

<sup>32</sup> <https://www.sciencedaily.com/releases/2018/04/180423125052.htm>

<sup>33</sup> Is CBD Oil Harmful or Healing? What No One is Telling You  
<https://www.thehealthyhomeeconomist.com/cbd-oil-dangers/#comment-643247>



smoke to children is critical for providers, parents, and policymakers to best protect children from harmful exposures.<sup>34</sup>

The rate of marijuana exposures among children under the age of six increased by 147.5% in the United States between 2000 and 2013 according to a study published in Clinical Pediatrics. Even more disturbing in the states that have legalized “medical” marijuana, the rate rose nearly 610% over that time. The data comes from the National Poison Data System. 75% percent of the children were exposed by ingesting edible marijuana products such as marijuana-infused candy. Clinical effects include drowsiness or lethargy, ataxia [failure of muscle coordination], agitation or irritability, confusion and coma, respiratory depression, and single or multiple seizures.<sup>35</sup>

### **The World Health Organization Position on Acute Health Effects of Cannabis Use**

The acute effects of cannabis use has been recognized for many years, and recent studies have confirmed and extended earlier findings. These may be summarized as follows:

1. Cannabis impairs cognitive development (capabilities of learning), including associative processes
2. free recall of previously learned items is often impaired when cannabi is used both during learning and recall periods;
3. Cannabis impairs psychomotor performance in a wide variety of tasks, such as motor coordination, divided attention, and operative tasks of many types; human performance on complex machinery can be impaired for as long as 24 hours after smoking as little as 20 mg of
4. THC in cannabis; there is an increased risk of motor vehicle accidents among persons who drive when intoxicated by cannabis.

### **Chronic health effects of cannabis use**

1. Selective impairment of cognitive functioning which include the organization and integration of complex information involving various mechanisms of attention and memory processes.
2. Prolonged use may lead to greater impairment, which may not recover with cessation of use, and which could affect daily life functions.
3. Development of a cannabis dependence syndrome characterized by a loss of control over cannabis use is likely in chronic users.
4. Cannabis use can exacerbate schizophrenia in affected individuals.
5. Epithelial injury of the trachea and major bronchi is caused by long-term cannabis smoking.

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<sup>34</sup> Detecting biomarkers of secondhand marijuana smoke in young children, Karen M. Wilson, Michelle R. Torok, Binnian Wei, Lanqing Wang, Michelle Robinson, Connie S. Sosnoff & Benjamin C. Blount, *Pediatric Research* volume 81, pages 589–592 (2017) doi:10.1038/pr.2016.261 <https://www.medscape.com/medline/abstract/27911435>

<sup>35</sup> <http://journals.sagepub.com/doi/full/10.1177/0009922815589912>

6. Airway injury, lung inflammation, and impaired pulmonary defence against infection from persistent cannabis consumption over prolonged periods.

7. Heavy cannabis consumption is associated with a higher prevalence of symptoms of chronic bronchitis and a higher incidence of acute bronchitis than in the non-smoking cohort.

8. Cannabis used during pregnancy is associated with impairment in fetal development leading to a reduction in birth weight. Cannabis use during pregnancy may lead to postnatal risk of rare forms of cancer.

## **Emergency care**

In Colorado, increased marijuana use after legalization has been accompanied by an increase in the number of emergency department visits and hospitalizations related to acute marijuana intoxication. Data from the Colorado Hospital Association, a consortium of more than 100 hospitals in the state, shows that the prevalence of hospitalizations for marijuana exposure in patients aged 9 years and older doubled after the legalization of medical marijuana and that emergency department visits nearly doubled after the legalization of recreational marijuana, although these findings may be limited because of stigma surrounding disclosure of marijuana use in the prelegalization era. However, the same trend is found in the number of civilian calls to the Colorado poison control center. In the years after both medical and recreational marijuana legalization, the call volume for marijuana exposure doubled compared with that during the year before legalization.<sup>36</sup>

Emergency room admissions for marijuana use now exceed those for heroin and are continuing to rise.<sup>37</sup>

## **Medical Dangers to Children of Marijuana Use and Exposure**

### **Marijuana related suicides of young people in colorado**

Marijuana is the Number 1 substance now found in suicides of young people in Colorado who are 10-19 years old. Go to the below Colorado website and click on the box that lists “methods, circumstances and toxicology” and then click on the two boxes for 10-19 years olds. The marijuana data will appear.<sup>38</sup>

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<sup>36</sup> Kim HS, Monte AA. Colorado cannabis legalization and its effect on emergency care. *Ann Emerg Med*. 2016;68:71-75.

[https://search.aol.com/aol/search?q=http%3a%2f%2fcolorado%2520cannabis%2520legalization%2520and%2520its%2520effect%2520on%2520emergency%2520care%2e&s\\_it=loki-dnserror](https://search.aol.com/aol/search?q=http%3a%2f%2fcolorado%2520cannabis%2520legalization%2520and%2520its%2520effect%2520on%2520emergency%2520care%2e&s_it=loki-dnserror)

<sup>37</sup> <https://learnaboutsam.org/science>

<sup>38</sup>

[https://cohealthviz.dphe.state.co.us/t/HSEBPublic/views/CoVDRS\\_12\\_1\\_17/Story1?:embed=y&:showAppBanner=false&:showShareOptions=true&:display\\_count=no&:showVizHome=no#4](https://cohealthviz.dphe.state.co.us/t/HSEBPublic/views/CoVDRS_12_1_17/Story1?:embed=y&:showAppBanner=false&:showShareOptions=true&:display_count=no&:showVizHome=no#4)

## **Toddlers with lung inflammation**

In Colorado one in six infants and toddlers hospitalized for lung inflammation are testing positive for marijuana exposure. This has been a 100% increase since legalization (10% to 21%). Non-white kids are more likely to be exposed than white kids.<sup>39</sup>

## **Teen ER visits**

Marijuana related emergency room visits by Colorado teens is substantially on the rise. They see more kids with psychotic symptoms and other mental health problems and chronic vomiting due to marijuana use.<sup>40</sup>

## **Gynecomastia**

Gynecomastia is when there is swelling of breast tissues in males. It is caused by an imbalance of the hormones estrogen and testosterone. According to the Mayo Clinic It can result from the use of marijuana.<sup>41</sup> Males with enlarged breasts may have an increased risk for breast cancer.<sup>42</sup>

## **Sexual Dysfunction**

Research on marijuana and sexual health suggests that male smokers could be courting sexual dysfunction. The healthy development and status of male genitalia are also affected by marijuana use.<sup>43</sup>

## **Excessive Bleeding after Surgery.**

Marijuana use can lead to negative cardiovascular effects such as increased in heart rate that can lead to bleeding during and after surgery. There is also increased oxygen consumption by the body which can lower normal blood oxygen level below safe levels during surgery. The quickest way to obtain the effects of marijuana is to inhale deeply and hold before exhalation. This is

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<sup>39</sup> <https://www.sciencedaily.com/releases/2016/04/160430100247.htm>

<sup>40</sup>

<https://www.reuters.com/article/us-health-marijuana-kids/marijuana-related-er-visits-by-colorado-teens-on-the-rise-id-USKBN1H038A>

<sup>41</sup>

<https://www.mayoclinic.org/diseases-conditions/gynecomastia/symptoms-causes/syc-20351793>

<sup>42</sup> National Institutes of Health, National Library of Medicine <https://medlineplus.gov/ency/article/003165.htm>

<sup>43</sup> <https://www.livescience.com/12825-marijuana-men-sexual-function.html>

believed to damage lining of the alveolar cells in the lungs, possibly leading to poor oxygenation during and after surgery. Smokers have a more reactive airway (coughing) leading to an increased risk of aspiration during and after surgery. Marijuana can also increase or potentiate the effects of many medications that are used to lower the central nervous system in order to achieve a more relaxed state. This can lead to a deeper level of anesthesia than that is intended with IV sedation. Local anesthesia, typically used to “numb” the surgical area, usually increases the heart rate. This can also be potentiated with the use of marijuana, leading to increased bleeding during and after surgery. Marijuana smokers are more likely than non-smokers to be on the ventilator longer, have higher risk of developing pneumonia after surgery and greater scarring of incisions. Use of marijuana, especially immediately prior to surgery, can change the doses needed for sedation. Propofol a commonly used medication needs substantially higher doses for patients who routinely use marijuana. People who use marijuana may require a dramatic increase in sedation. Marijuana causes blood vessels in the body to relax. This vasodilation can cause the blood pressure to fall and the heart rate to increase. This can complicate matters if the patient’s blood pressure is falling due to issues with the surgery, and can change the way the body responds to anesthesia. Using marijuana after surgery can slow wound healing and increase scarring of incisions. Smoking marijuana decreases the amount of oxygen available to the tissues and skin of your incision site. This delays healing and makes scarring more likely. This can slow recovery as a whole and increase risk of infection. <sup>44</sup>

### **Gateway to Other Addictions**

Is marijuana a gateway drug?

Use of alcohol, tobacco, and marijuana are likely to come before use of other drugs. Animal studies have shown that early exposure to addictive substances, including THC, may change how the brain responds to other drugs. For example, when rodents are repeatedly exposed to THC when they're young, they later show an enhanced response to other addictive substances—such as morphine or nicotine—in the areas of the brain that control reward, and they're more likely to show addiction-like behaviors. <sup>45</sup>

99% of people who are addicted to other drugs started with alcohol and marijuana. So, indeed, marijuana use makes addiction to other drugs more likely. <sup>46</sup>

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<sup>44</sup> <https://www.drmasoomi.com/blog/marijuana-use-and-surgery/>  
<https://www.verywell.com/marijuana-and-surgery-3156981>

<sup>45</sup> <https://www.drugabuse.gov/publications/drugfacts/marijuana>

<sup>46</sup> <https://learnaboutsam.org/science/>

More young people are in treatment for marijuana abuse or dependence than for the use of alcohol and all other drugs. <sup>47</sup>

Long-term studies of high school students and their patterns of drug use show that very few young people use other drugs without first trying marijuana. The risk of using cocaine has been estimated to be more than 104 times greater for those who have tried marijuana than for those who have never tried it. <sup>48</sup>

## **Brain Damage**

Marijuana smokers had changes in the blood flow in their brains even after a month of not smoking, according to a study published in Neurology, the scientific journal of the American Academy of Neurology. The findings may explain in part the problems with thinking or remembering found in other studies of marijuana users. <sup>49</sup>

## **Strokes**

Marijuana seems to be a risk factor for stroke. It is known to have short-term effects on the cardiovascular system, including speeding the heart rate, raising or lowering blood pressure, and even elevating the risk of heart attack in the hour after use. However, it's not entirely clear how marijuana may cause a stroke which occurs when blood flow to the brain is cut off and brain tissue begins to die. A sudden constriction of the arteries after smoking the drug may be to blame. "recreational cannabis use appears not to be as harmless as was thought," writes Dr. Dominique Deplanque of the University of Lille in France, "there is a need to improve public information." <sup>50</sup>

Other studies:

Many case reports support a causal link between cannabis and cerebrovascular events. This accords well with epidemiological and mechanistic research on the cerebrovascular effects of cannabis.<sup>51</sup>

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<sup>47</sup> <https://learnaboutsam.org/science>

<sup>48</sup> Kandel, D. B. Stages in adolescent involvement with drugs. *Science*, 190:912-914, 1975.

<sup>49</sup> "Marijuana May Affect Blood Flow in Brain" - Reuters, 7 February 2005  
<https://www.sciencedaily.com/releases/2005/02/050211084701.htm>

<sup>50</sup> <https://forum.drugs.com/latest-drug-related-news/more-evidence-ties-marijuana-stroke-risk-25372.html>

<sup>51</sup> <https://www.ncbi.nlm.nih.gov/pubmed/25700287>

Episodic marijuana use may represent a risk factor for stroke in childhood, particularly in the posterior circulation. Early recognition of the cerebellar stroke syndrome may allow prompt neurosurgical intervention, reducing morbidity.<sup>52</sup>

Cannabis use is associated with arterial disease such as stroke, myocardial infarction, and limbs arteritis. It appears essential to investigate cannabis use in young patients presenting with such arterial manifestations, as outcome is closely correlated with cannabis withdrawal.<sup>53</sup>

Heavy marijuana use is a risk factor for CV disease in HIV-infected men ages 40-60, independent of tobacco smoking and traditional risk factors.<sup>54</sup>

## **Infertility**

The increased load of cannabinoids in the bodies of people who abuse marijuana could flood the natural endocannabinoid-signal systems in reproductive organs and adversely impact fertility and this may explain observations made over the past 30 to 40 years that marijuana smoke drastically reduces sperm production in males.<sup>55</sup>

## **Emergency Room Visits Connected to Marijuana**

The Drug Abuse Warning Network (DAWN), a system for monitoring the health impact of drugs, estimated that in 2011, there were nearly 456,000 drug-related emergency department visits in the United States in which marijuana use was mentioned in the medical record (a 21 percent increase over 2009). About two-thirds of patients were male and 13 percent were between the ages of 12 and 17. It is unknown whether this increase is due to increased use, increased potency of marijuana (amount of THC it contains), or other factors. It should be noted, however, that mentions of marijuana in medical records do not necessarily indicate that these emergencies were directly related to marijuana intoxication.<sup>56</sup>

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<sup>52</sup> <http://pediatrics.aappublications.org/content/113/4/e365>

<sup>53</sup> <https://www.ncbi.nlm.nih.gov/pubmed/23850313>

<sup>54</sup> <https://www.ncbi.nlm.nih.gov/pubmed/28449059>

<sup>55</sup> "Marijuana Firmly Linked to Infertility" - Scientific American, 22 December 2000  
<https://www.scientificamerican.com/article/marijuana-firmly-linked-t/>

<sup>56</sup> Source: Center for Behavioral Health Statistics and Quality (CBHSQ). Drug Abuse Warning Network: 2011: Selected Tables of National Estimates of Drug-Related Emergency Department Visits. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013.  
<https://www.drugabuse.gov/publications/research-reports/marijuana/what-scope-marijuana-use-in-united-states>

## **Cannabinoid Hyperemesis Syndrome**

Studies show that chronic use of marijuana can lead to Cannabinoid Hyperemesis Syndrome (CHS) which is a condition with recurrent bouts of severe nausea, vomiting, and dehydration. CHS usually occurs in people under 50 years of age and with a long history of marijuana use. CHS can lead users to make frequent trips to the emergency room, but can be resolved when a person stops using marijuana. Cannabis hyperemesis syndrome (CHS) which can result in kidney failure.<sup>57</sup>

CHS should be considered as a possible diagnosis in patients with recurrent intractable vomiting and strong history of cannabis abuse.<sup>58</sup> This can be a health problem during pregnancy.<sup>59</sup>

The reader is advised to consult an article published in the December 16, 2016 edition of *Gastroenterology*.<sup>60</sup> It has many useful details for clinicians about CHS including its phases, diagnosis and treatment. The article abstract states:

ABSTRACT: Marijuana, or cannabis, is commonly thought to be a benign substance without adverse effects; however, cannabinoid hyperemesis syndrome (CHS) is a sequela of chronic cannabis use. Clinicians should strongly suspect CHS in long-term users of cannabis who present with intractable nausea and vomiting and whose symptoms are relieved by bathing in hot water. A lack of response to antiemetics should assist in the diagnosis of CHS. The only treatment to successfully resolve CHS is abstinence from cannabis, although haloperidol is being studied as a potential treatment option. A patient experiencing CHS should be counseled to avoid cannabis because continued use will trigger further symptoms.

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<sup>57</sup> Galli JA, Sawaya RA, FriedenberG FK. Cannabinoid Hyperemesis Syndrome. *Curr Drug Abuse Rev.* 2011;4(4):241-249.

Sorensen CJ, DeSanto K, Borgelt L, Phillips KT, Monte AA. Cannabinoid Hyperemesis Syndrome: Diagnosis, Pathophysiology, and Treatment-a Systematic Review. *J Med Toxicol.* 2017;13(1):71-87.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5330965/>

Alaniz VI, Liss J, Metz TD, Stickrath E. Cannabinoid hyperemesis syndrome: a cause of refractory nausea and vomiting in pregnancy. *Obstet Gynecol.* 2015 Jun;125(6):1484-6.

<sup>58</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3576702/>  
Cannabinoid Hyperemesis Syndrome, *Curr Drug Abuse Rev.* 2011 Dec; 4(4): 241–249.

<sup>59</sup> <https://www.ncbi.nlm.nih.gov/pubmed/26592070>, Cannabinoid Hyperemesis Syndrome During Pregnancy: A Case Report. *J Reprod Med.* 2015 Sep-Oct;60(9-10):430-2.  
Cannabinoid Hyperemesis Syndrome During Pregnancy: A Case Report.

<sup>60</sup> Cannabinoid Hyperemesis Syndrome, *Gastroenterology*, December 16, 2016  
<https://www.uspharmacist.com/article/cannabinoid-hyperemesis-syndrome>

Colorado legalized marijuana in 2009 and since then the rate of CHS has doubled. <sup>61</sup>

CHS maybe unrecognized by physicians and this may lead to an extensive and costly patient medical evaluations. CHS may be misdiagnosed as any one of many disorders including pancreatitis or gastroparesis or cyclic vomiting syndrome (CVS). <sup>62</sup>

An ER physician, Dr. Roneet Lev, provided an excellent account of this syndrome in her presentation at the National Press Club. <sup>63</sup>

CHS has caused deaths. It is important to recognize CHS as a potential cause or contributing factor to death in marijuana users. <sup>64</sup>

### **Medication Interactions**

With increased use we are now seeing many medication interactions. People who choose to use marijuana are not being warned about this by the marijuana industry.

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<sup>61</sup> <http://www.bumc.bu.edu/emergencymedicine/files/2016/08/MJ-legalization-and-impact-on-EM-care.pdf>

Cyclic Vomiting Presentations Following Marijuana Liberalization in Colorado  
Howard S. Kim, MD, John D. Anderson, MD, Omeed Saghafi, MD, Kennon J. Heard, MD, PhD, and Andrew A. Monte, MD, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4469074/>

<sup>62</sup> Cannabinoid Hyperemesis Syndrome, Gastroenterology, December 16, 2016  
<https://www.uspharmacist.com/article/cannabinoid-hyperemesis-syndrome>

<sup>63</sup> <https://www.c-span.org/video/?4444334-1/rep-patrick-kennedy-speaks-marijuana-policy>

<sup>64</sup> Cannabinoid Hyperemesis Syndrome: Reports of Fatal Cases.  
<https://www.ncbi.nlm.nih.gov/pubmed/29768651>