Marijuana THC Effects

Brain

Short term

* Altered senses, including time
	+ Senses: https://druglibrary.net/schaffer/hemp/general/mjeff1.htm
	+ Time: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3581701/
* Changes in mood: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6329464/
* Euphoria: https://nida.nih.gov/publications/research-reports/marijuana/what-are-marijuana-effects#:~:text=Many%20people%20experience%20a%20pleasant,of%20time%2C%20and%20increased%20appetite.
* Lethargy: https://www.uptodate.com/contents/cannabis-marijuana-acute-intoxication
* Hallucinations: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5908416/
* Delusions: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6861931/
* Paranoia: https://dualdiagnosis.org/marijuana-abuse/marijuana-paranoia/#:~:text=%E2%80%9CResearchers%20believe%20that%20THC%2C%20the,are%20attempting%20to%20harm%20us.%E2%80%9D
* Psychosis: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3927252/#:~:text=Cannabis%20is%20involved%20in%20approximately,occur%20is%20not%20well%20understood.
* Impaired motor skills: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4966282/
* Difficulty problem solving and thinking: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4966282/
* Impaired memory: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3931635/
* Learning: https://www.samhsa.gov/marijuana
* Poor judgment: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4536096/#:~:text=Cannabis%20users%20with%20poor%20decision,these%20findings%20to%20cannabis%20users.
* Agitation: https://www.webmd.com/connect-to-care/addiction-treatment-recovery/marijuana/marijuana-and-anger
* Mania: https://pubmed.ncbi.nlm.nih.gov/16793142/
* Anxiety:
	+ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7723145/
	+ https://adai.uw.edu/pubs/pdf/2017mjanxiety.pdf
* Worsening of PTSD symptoms: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6258013/

Long term

* Cannabis dependence or addiction (CUD): https://nida.nih.gov/publications/research-reports/marijuana/marijuana-addictive
* Depression:
	+ <https://pubmed.ncbi.nlm.nih.gov/33332004/>
	+ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7723145/
* Anxiety: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7723145/
* Mania: https://www.sciencedaily.com/releases/2015/02/150210160101.htm
* Chronic psychosis or schizophrenia (CIP): https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7442038/#:~:text=Frequent%20use%20of%20cannabis%2C%20especially,high%20potency%20THC%20%5B18%5D.
* Increased risk for suicide:
	+ <https://www.nih.gov/news-events/news-releases/cannabis-use-may-be-associated-suicidality-young-adults>
	+ https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781215
* Reduction in developmental pruning:
	+ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8445589/>
	+ <https://nida.nih.gov/news-events/nida-notes/2019/08/thc-exposure-in-adolescence-disrupts-brain-maturation-in-animals>
	+ https://www.jneurosci.org/content/36/26/7039.abstract
* Smaller brain regions (hippocampus- memory region): https://www.webmd.com/brain/news/20080602/marijuana-use-may-shrink-the-brain#:~:text=Researchers%20found%20that%20the%20hippocampus,an%20average%20of%207%25%20smaller.
* Diminished visuospatial functioning:
	+ <https://www.ucentral.cl/ucentral/site/docs/20200818/20200818121543/visuospatial_processing_decline.pdf>
	+ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6925658/
* verbal learning: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6758553/#:~:text=Participants%20who%20reported%20marijuana%20use,for%20verbal%20learning%20and%20memory.
* short-term memory:
	+ https://nida.nih.gov/publications/research-reports/marijuana/what-are-marijuanas-long-term-effects-brain
	+ https://www.seattletimes.com/nation-world/study-says-heavy-marijuana-use-can-damage-short-term-memory/
	+ https://www.health.harvard.edu/mind-and-mood/the-effects-of-marijuana-on-your-memory
* cognitive function & executive function attention: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3037578/#:~:text=Cannabis%20use%20has%20been%20shown,and%20control%20emotions%20and%20behavior.
* motor skills: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4966282/>
* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3037578/
* Stroke:
	+ <https://www.ahajournals.org/doi/10.1161/STROKEAHA.120.032811>
	+ https://jnnp.bmj.com/content/76/3/435

Lungs

Short term

* Difficulty breathing: https://www.thoracic.org/patients/patient-resources/resources/marijuana.pdf Infections
* toxins in marijuana smoke are similar to tobacco smoke: https://www.nature.com/articles/s41598-020-63120-6.pdf

Long term

* EVALI (vaping injury): https://pubs.acs.org/doi/pdf/10.1021/acs.chemrestox.1c00290
* Bronchitis: https://www.lung.org/quit-smoking/smoking-facts/health-effects/marijuana-and-lung-health#:~:text=Research%20shows%20that%20smoking%20marijuana,production%2C%20wheeze%20and%20acute%20bronchitis.
* Emphysema: https://journal.copdfoundation.org/Portals/0/JCOPDF/Files/Volume5-Issue1/JCOPDF-2017-0180-Leb.pdf
* Increased risk for cancer:
	+ <https://erj.ersjournals.com/content/31/2/280>
	+ <https://www.nature.com/articles/s41598-021-93411-5>
	+ [https://www.thelancet.com/journals/lanepe/article/PIIS2666-7762(21)00231-3/fulltext](https://www.thelancet.com/journals/lanepe/article/PIIS2666-7762%2821%2900231-3/fulltext)
	+ <https://bmccancer.biomedcentral.com/articles/10.1186/s12885-021-08598-7>

Heart

Short term

* 4.8 Increase risk of heart attack within 60 mins of use
	+ <https://www.health.harvard.edu/blog/marijuana-may-be-risky-for-your-heart-2020070120347>
* increased heart rate: https://nida.nih.gov/publications/research-reports/marijuana/what-are-marijuanas-effects-on-other-aspects-of-physical-health#:~:text=The%20heart%20rate%E2%80%94normally%2070,marijuana%20can%20amplify%20this%20effect.
* blood pressure: https://www.health.harvard.edu/heart-health/marijuana-linked-to-high-blood-pressure-risk

Kidney

* Kidney (renal) failure due to CHS - Cannabinoid Hyperemesis Syndrome: https://www.narcononojai.org/blog/why-kidney-failure-is-the-latest-problem-associated-with-marijuana-use.html

GI System and Pain

* Cyclic vomiting (Cannabinoid Hyperemesis Syndrome): https://www.cedars-sinai.org/health-library/diseases-and-conditions/c/cannabinoid-hyperemesis-syndrome.html#:~:text=Cannabinoid%20hyperemesis%20syndrome%20(CHS)%20is,include%20THC%20and%20related%20chemicals.
* abdominal pain (Cannabinoid Hyperemesis Syndrome): https://americanaddictioncenters.org/marijuana-rehab/cannabinoid-hyperemesis-syndrome

Male/Female

* Testicular cancer
	+ <https://www.fredhutch.org/en/news/releases/2009/02/marijuana.html>
	+ <https://www.webmd.com/cancer/news/20120910/marijuana-tied-to-testicular-cancer>
* Sperm count
	+ <https://pubmed.ncbi.nlm.nih.gov/30916627/>
	+ https://news.tulane.edu/pr/study-tulane-researcher-suggests-marijuana-can-cause-infertility-men
* Increased developmental and mental disorders in children of mothers who use cannabis when pregnant
	+ https://www.samhsa.gov/marijuana/marijuana-pregnancy
	+ https://www.nbcnews.com/health/womens-health/pot-use-pregnancy-linked-mental-behavioral-health-issues-kids-rcna5597
	+ https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-020-0880-9
* Reproductive issues in
	+ Males
		- https://pubmed.ncbi.nlm.nih.gov/30916627/#:~:text=Research%20supports%20a%20role%20for,inhibiting%20capacitation%20and%20fertilizing%20capacity.
		- <https://news.tulane.edu/pr/study-tulane-researcher-suggests-marijuana-can-cause-infertility-men>
		- https://bcmj.org/articles/effects-cannabis-female-and-male-reproduction
	+ Females
		- https://flo.health/getting-pregnant/trying-to-conceive/fertility/marijuana-and-fertility
		- https://bcmj.org/articles/effects-cannabis-female-and-male-reproduction
		- https://www.sciencedaily.com/releases/2020/04/200402134628.htm#:~:text=Summary%3A,according%20to%20an%20animal%20study.

Other Systems

* Genetic damage:
	+ https://www.nature.com/articles/s41598-021-93411-5.pdf
	+ <https://www.sciencedaily.com/releases/2009/06/090615095940.htm#:~:text=Marijuana%20Damages%20DNA%20And%20May%20Cause%20Cancer%2C%20New%20Test%20Reveals,-Date%3A%20June%2015&text=Summary%3A,increase%20the%20risk%20of%20cancer>.
	+ https://www.nicswell.co.uk/health-news/could-cannabis-damage-dna-that-is-then-passed-down-generations
	+ https://pubmed.ncbi.nlm.nih.gov/2174024/
* Impacts on the Endocrine system
	+ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6813821/
	+ https://pubmed.ncbi.nlm.nih.gov/30618031/#:~:text=So%20far%2C%20endogenous%20cannabinoids%20have,gland%2C%20pancreas%2C%20and%20gonads.

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**Marijuana products are:**

* **More Concentrated (Potent):**
	+ https://nida.nih.gov/drug-topics/marijuana/cannabis-marijuana-potency
	+ <https://www.addictioncenter.com/drugs/marijuana/weed-stronger-than-before/#:~:text=According%20to%20a%20study%20published,%25%20to%2025%25%20concentration%20rate>.
	+ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6312155/>
* **More Accessible**
	+ https://www.newportacademy.com/resources/substance-abuse/effects-of-marijuana-legalization/
	+ https://www.vox.com/identities/2018/8/20/17938388/marijuana-legalization-more-use
* **More Life-Threatening**
	+ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8672965/
	+ https://www.uptodate.com/contents/cannabis-marijuana-acute-intoxication
* **More Attractive**
	+ [**https://billypenn.com/2021/09/24/cannabis-marijuana-packaging-philadelphia-weed-bags/**](https://billypenn.com/2021/09/24/cannabis-marijuana-packaging-philadelphia-weed-bags/)
	+ [**https://www.nytimes.com/2021/05/22/style/edibles-marijuana.html**](https://www.nytimes.com/2021/05/22/style/edibles-marijuana.html)

than ever before.