

**C**annabis use is on the rise globally and in the United States, where it is the most commonly used federally illegal drug among men of reproductive age.<sup>1,2</sup>

In 2020, 34.5% of young adult men aged 18 to 25 years and 16.3% aged 26 or older used cannabis.<sup>2</sup>

These levels of cannabis use make it important to understand any impact on male fertility and reproductive health.

### Clinical Considerations

Prior studies have demonstrated the presence of cannabinoid receptors on sperm and throughout the male reproductive tract, and the key role the endocannabinoid system has in regulating male reproduction.<sup>3,4</sup>

These studies suggest cannabis can affect male fertility as:

- Cannabis use affects semen parameters, specifically sperm count, concentration, motility, viability, and morphology, which can inhibit capacitation and fertilization.<sup>5-8</sup>
- Preclinical studies suggest that cannabis use results in testicular atrophy, although not well-studied in humans.<sup>9-12</sup>

- The impact of cannabis use on the reproductive hormonal axis is variable, with minimal to no change seen in follicle stimulating hormone (FSH),<sup>13</sup> decreased luteinizing hormone (LH) levels,<sup>13,14</sup> and a variable response on testosterone.<sup>5,6,15</sup>

The available literature suggests cannabis use increases sexual desire but may limit coital performance.<sup>16-18</sup> Cannabis use is independently associated with increased sexual frequency and a greater number of sexual partners.

Questioned while shopping in dispensaries, users reported improved erectile function, orgasmic function, and sexual satisfaction.<sup>17,19,20</sup> However, the use of cannabis is also associated with orgasm inhibition and a two-fold increase in erectile dysfunction, potentially from accelerated endothelial damage.<sup>16,18</sup>

**Cannabis is the most commonly used federally illegal drug among men of reproductive age**

## Bottom Line

The existing literature examining the effect of cannabis on male fertility is limited because many studies relied on patient self-report, lacked quantification of cannabis used, did not specify mode of cannabis delivery, and subject populations were often from assisted reproductive centers or had polysubstance abuse histories.<sup>21-24</sup> The little that is known suggests cannabis use is associated with reduced male fertility and reproductive function.

Nonetheless, there are likely dose-dependent effects and a potential for reversibility. The duration after discontinuation of cannabis before some degree of recovery is achieved has not been clearly defined. Patients interested in conception should be made aware of these potential risks and consider cessation. Health care providers should discuss the potential effect on fertility with patients using cannabis medically and consider minimizing the dose needed to achieve symptom relief.

## References

1. United Nations Office on Drugs and Crime. *World drug report 2017: global overview of drug demand and supply*. 2017. (ISBN: 978-92-1-148291-1, eISBN: 978-92-1-060623-3, United Nations publication, Sales No. E.17.XI.6).
2. Center for Behavioral Health Statistics and Quality. *Key substance use and mental health indicators in the United States: results from the 2020 National Survey on Drug Use and Health*. Rockville, MD: Substance Abuse and Mental Health Services Administration;2021.
3. Nielsen JE, Rolland AD, Rajpert-de Meyts E, et al. Characterisation and localisation of the endocannabinoid system components in the adult human testis. *Sci Rep*. 2019;9(12866).
4. Rossato M, Ion Popa F, Ferigo M, Clari G, Foresta C. Human sperm express cannabinoid receptor Cb1, the activation of which inhibits motility, acrosome reaction, and mitochondrial function. *J Clin Endocrinol Metab*. 2005;90(2):984-991.
5. Gundersen TD, Jørgensen N, Andersson A-M, et al. Association between use of marijuana and male reproductive hormones and semen quality: a study among 1,215 healthy young men. *Am J Epidemiol*. 2015;182(6):473-481.
6. Hehemann MC, Raheem OA, Rajanahally S, et al. Evaluation of the impact of marijuana use on semen quality: a prospective analysis. *Ther Adv Urol*. 2021;13:1-9.
7. Pacey A, Povey A, Clyma J-A, et al. Modifiable and non-modifiable risk factors for poor sperm morphology. *Hum Reprod*. 2014;29(8):1629-1636.
8. Carroll K, Pottinger A, Wynter S, DaCosta V. Marijuana use and its influence on sperm morphology and motility: identified risk for fertility among Jamaican men. *Andrology*. 2020;8(1):136-142.
9. Hedges JC, Hanna CB, Bash JC, et al. Chronic delta-9-tetrahydrocannabinol exposure impacts testicular volume and male reproductive health in rhesus macaques *Fertil Steril*. 2022.
10. Dixit V, Gupta CL, Agrawal M. Testicular degeneration and necrosis induced by chronic administration of cannabis extract in dogs. *Endokrinologie*. 1977;69(3):299-305.
11. Dixit V, Sharma V, Lohiya N. The effect of chronically administered cannabis extract on the testicular function of mice. *Eur J Pharmacol*. 1974;26(1):111-114.
12. Banerjee A, Singh A, Srivastava P, Turner H, Krishna A. Effects of chronic bhang (cannabis) administration on the reproductive system of male mice. *Birth Defects Res B Dev Reprod Toxicol*. 2011;92(3):195-205.
13. Cone EJ, Johnson RE, Moore JD, Roache JD. Acute effects of smoking marijuana on hormones, subjective effects and performance in male human subjects. *Pharmacol Biochem Behav*. 1986;24(6):1749-1754.

14. Vescovi P, Pedrazzoni M, Michelini M, Maninetti L, Bernardelli F, Passeri M. Chronic effects of marijuana smoking on luteinizing hormone, follicle-stimulating hormone and prolactin levels in human males. *Drug Alcohol Depend.* 1992;30(1):59-63.
15. Rajanahally S, Raheem O, Rogers M, et al. The relationship between cannabis and male infertility, sexual health, and neoplasm: a systematic review. *Andrology.* 2019;7(2):139-147.
16. Gundersen TD, Jørgensen N, Andersson A-M, et al. Association between use of marijuana and male reproductive hormones and semen quality: a study among 1,215 healthy young men. *Am J Epidemiol.* 2015;182(6):473-481.
17. Pizzol D, Demurtas J, Stubbs B, et al. Relationship between cannabis use and erectile dysfunction: a systematic review and meta-analysis. *Am J Mens Health.* 2019;13(6):1-7.
18. Smith AM, Ferris JA, Simpson JM, Shelley J, Pitts MK, Richters J. Cannabis use and sexual health. *J Sex Med.* 2010;7(2):787-793.
19. Elbendary MA, El-Gamal OM, Salem KA. Analysis of risk factors for organic erectile dysfunction in Egyptian patients under the age of 40 years. *J Androl.* 2009;30(5):520-524.
20. Sun AJ, Eisenberg ML. Association between marijuana use and sexual frequency in the United States: a population-based study. *J Sex Med.* 2017;14(11):1342-1347.
21. Bhambhani HP, Kasman AM, Wilson-King G, Eisenberg ML. A survey exploring the relationship between cannabis use characteristics and sexual function in men. *Sex Med.* 2020;8(3):436-445.
22. Hembree III W, Nahas G, Zeidenberg P, Huang H. Changes in human spermatozoa associated with high dose marijuana smoking. In: *Marijuana Biological Effects.* Elsevier; 1979:429-439.
23. Nassan FL, Arvizu M, Mínguez-Alarcón L, et al. Marijuana smoking and markers of testicular function among men from a fertility centre. *Hum Reprod.* 2019;34(4):715-723.
24. Wise LA, Wesselink AK, Hatch EE, et al. Marijuana use and fecundability in a North American preconception cohort study. *J Epidemiol Community Health.* 2018;72(3):208-215.
25. Close CE, Roberts PL, Berger RE. Cigarettes, alcohol and marijuana are related to pyospermia in infertile men. *J Urol.* 1990;144(4):900-903.

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