



# **Emerging Substance Quick Take: Kratom**

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# Disclosures



Cataloochee, North Carolina, photo by N. Erskine

- AH is a salaried employees of UNC Health with academic affiliations to UNC School of Medicine and have no potential conflicts of interests to disclose.
- Presentation discusses off-label use of medications.
- AI (Doximity GPT) was utilized to identify additional references. The authors personally reviewed the AI-suggested references due to unreliability of AI output. Slide text was independently drafted and edited by authors.
- UNC addiction medicine Nathaniel Erskine MD contributed to the drafting of this presentation

# Objectives



Boone, North Carolina, photo by N. Erskine

- Describe pharmacology and epidemiology of kratom use
- Review clinical considerations of kratom intoxication and withdrawal
- Discuss assessment and treatment options for those engaged in kratom use

# What is Kratom?



- “Kratom” refers to *Mitragyna speciosa*, a tree native to Southeast Asia, and leaf derivatives marketed as herbal supplements<sup>1</sup>
- Leaves contain over 50 alkaloids
- Mitragynine and 7-hydroxymitragynine (7-OH) are the most pharmacologically active<sup>2,3</sup>
- Total alkaloid content ranges 0.5 to 1.5% by dry weight, with mitragynine comprising ~60% of the total alkaloids<sup>4</sup>

1. <https://nida.nih.gov/research-topics/kratom#kratom>

2. <https://www.fda.gov/news-events/public-health-focus/fda-and-kratom>

3. *G3: Genes|Genomes|Genetics*, 11(4), jkab058.

4. *Neurosci Biobehav Rev*, 37(2), 138–151

# Kratom Preparations

Preparation	Notes	Common Routes of Ingestion
<b>Raw leaf</b>	Leaves consumed fresh or dried with minimal processing	Chewed Tea Mixed into beverages
<b>Powdered leaf products</b>	Nonmodified leaf powder placed into capsules or compressed into tablets	Oral ingestion (“toss and wash”) of capsules/tablets Tea
<b>Extract-based products</b> (resins, tinctures, liquid shots, gummies)	Alkaloids concentrated via solvent extraction (e.g., ethanol, methanol, CO <sub>2</sub> ), then evaporated or diluted into liquid or edible formulations	Oral ingestion Sublingual (liquids/tinctures) Vaporized (rare, concentrated forms)
<b>7-OH-enriched / semi-synthetic products</b>	Enriched with 7-hydroxymitragynine (7OH) 7OH derived from oxidation of mitragynine or laboratory synthesis Typically standardized to high potency	Sublingual tablets/films Powders Liquid shots Gummies

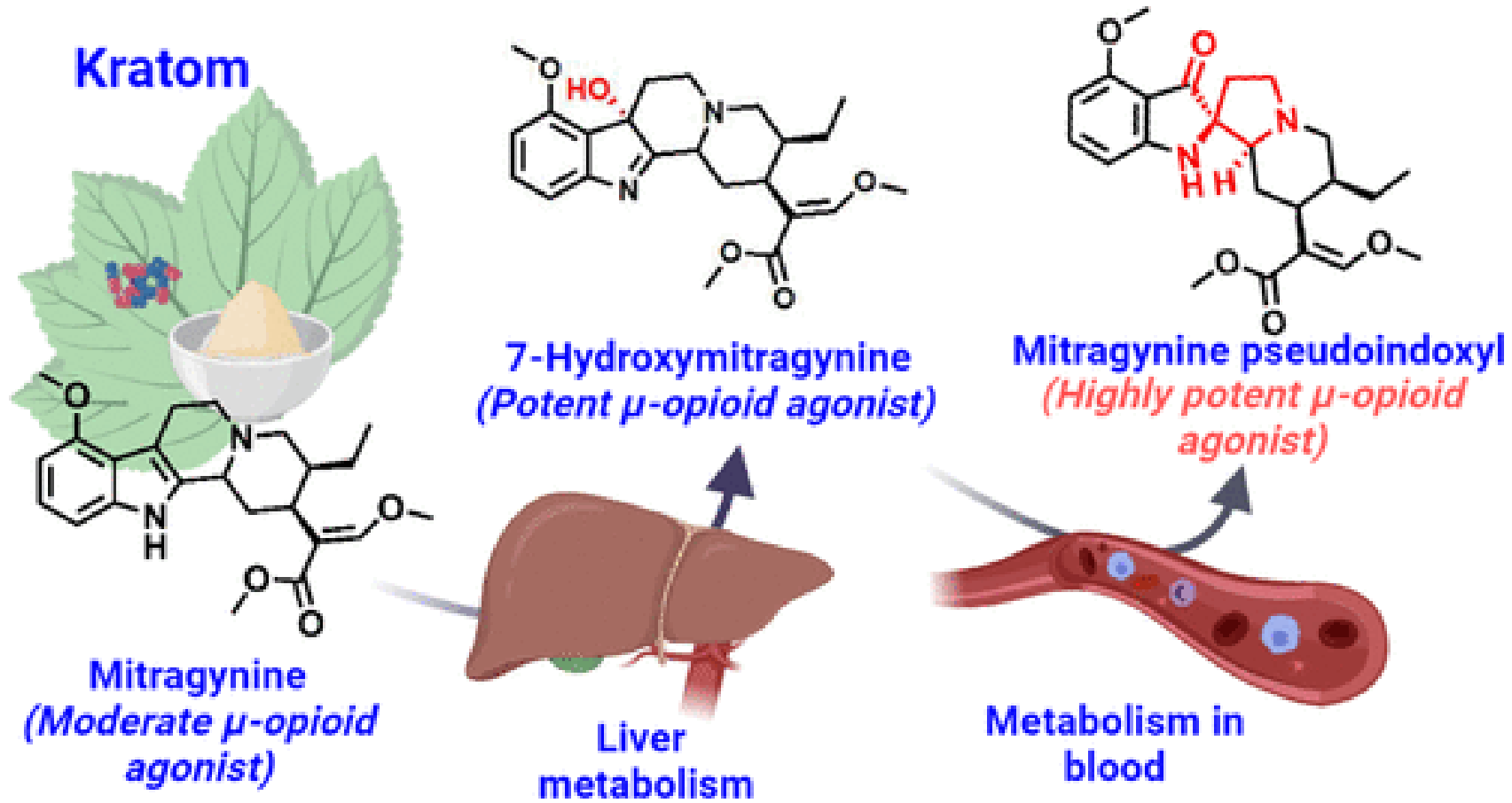




Images: <https://www.vcuhealth.org/news/is-kratom-safe-rising-health-concerns-explained/>

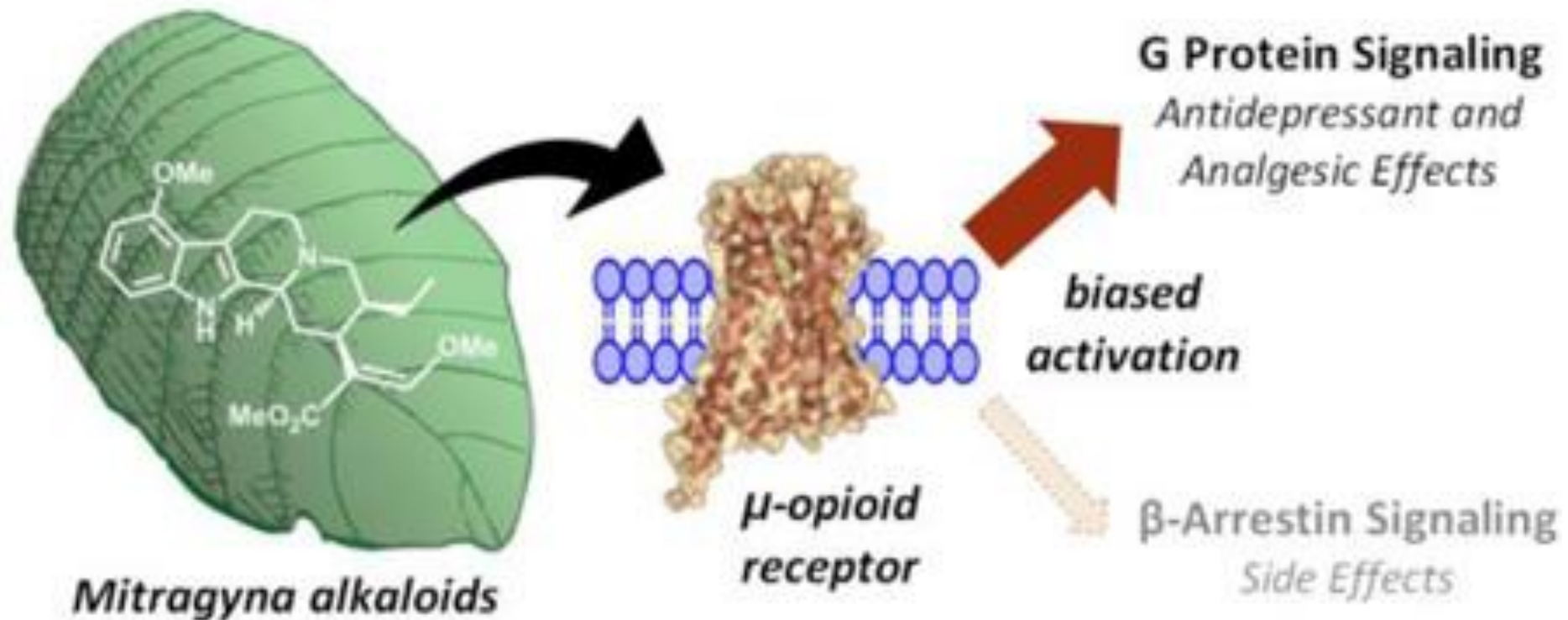
Dr. Alison Holt, UNC School of Medicine

# Kratom Pharmacology<sup>1</sup>



1. Figure from ACS pharmacology & translational science, 3(6), 1063-1068.

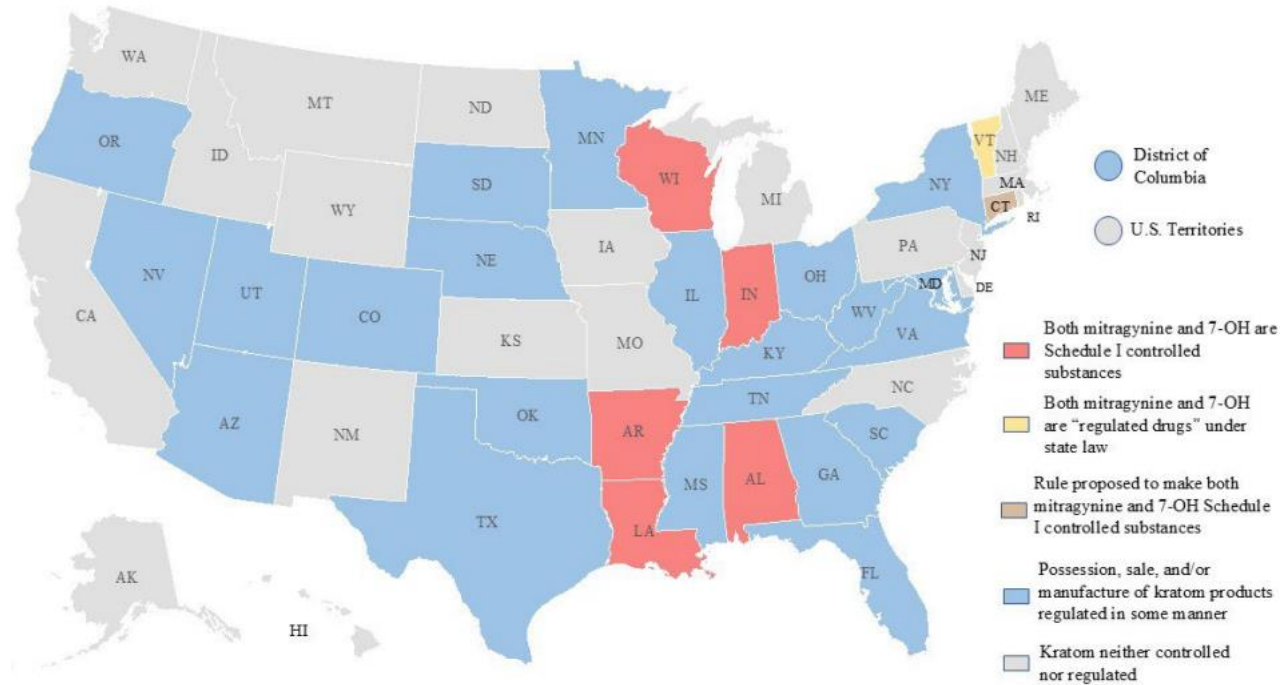
# Kratom Pharmacology<sup>1</sup>



1. Figure from Journal of the American Chemical Society, 138(21), 6754-6764.

# Kratom Legality & Market

Bans (red) and regulation (blue) of kratom in the U.S. (January 2026)<sup>3</sup>



- DEA lists kratom as a drug of concern, but not federally scheduled<sup>1</sup>
- Six U.S. states ban kratom<sup>3</sup>
- 23 states and D.C. have regulated markets<sup>3</sup>
- U.S. kratom market valued around \$2 billion (like market for peanut butter)<sup>2</sup>
- Consumers obtain kratom and derivatives via e-commerce, smoke shops, convenience stores<sup>3</sup>

1. <https://www.congress.gov/crs-product/LSB11082>

2. <https://finance.yahoo.com/news/kratom-market-surpass-usd-7-145600034.html>; <https://www.cnbc.com/video/2023/07/14/inside-americas-2-billion-peanut-butter-industry.html>

3. Figure: Legislative Analysis and Publication Policy. "Kratom: Summary of State Laws" 2026, accessed at <https://legislativeanalysis.org/wp-content/uploads/2026/02/Kratom-Summary-of-State-Laws.pdf>

# Epidemiology of Kratom Use

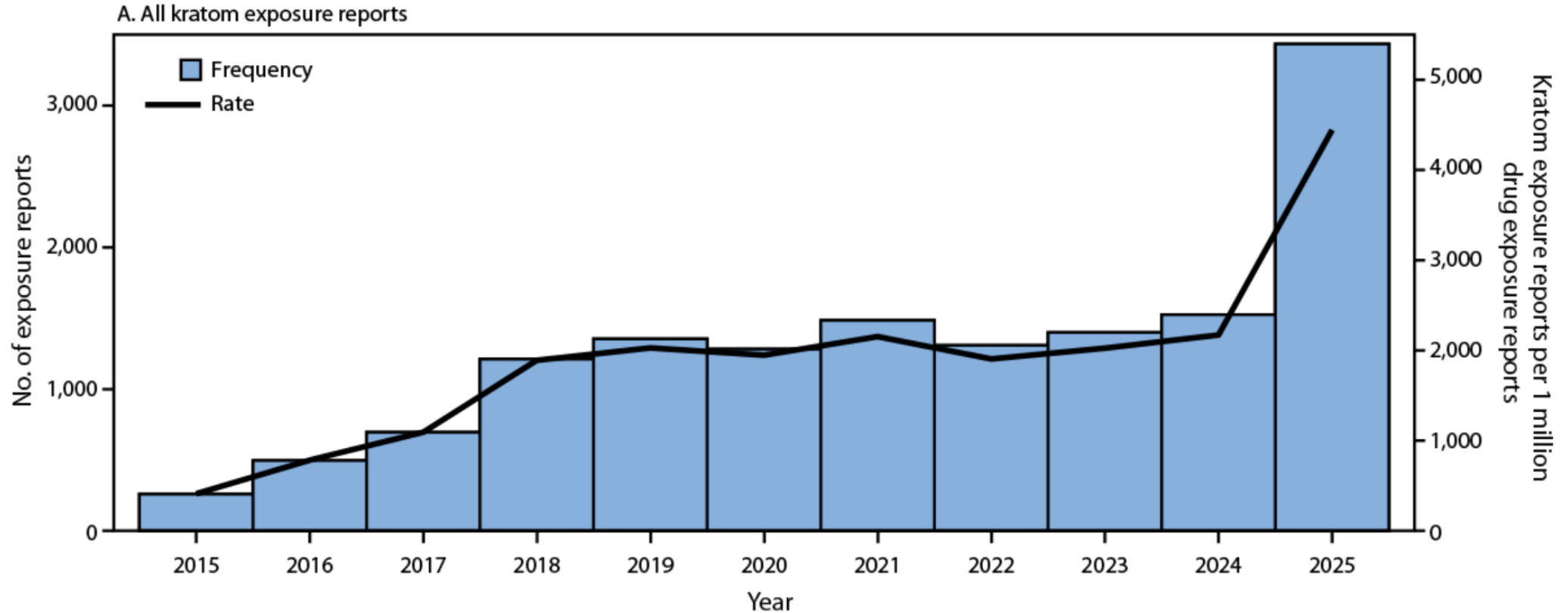


- Prevalence underestimated in clinics due to lack of screening, available toxicology testing
- Prevalence of kratom use 0.68% (95% CI: 0.60% to 0.77%) in NSDUH (2021 to 2023)<sup>1</sup>
- Prevalence higher among those:<sup>1</sup>
  - Identifying as male
  - Identifying as multiracial
  - 26 to 34 years old
  - Living in nonmetropolitan areas
  - In fair/poor health,
  - Using tobacco
  - In psychiatric distress
  - Using other stimulants, opioids, and ketamine

1. J Addict Med. 2026 Jan 26. doi: 10.1097/ADM.0000000000001637.

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# Surge in Kratom Exposures Reported to U.S. Poison Centers<sup>1</sup>



1. MMWR Morb Mortal Wkly Rep 2026;75:139–145. DOI: <http://dx.doi.org/10.15585/mmwr.mm7511a1>.

# Assessment of Kratom Use<sup>1</sup>



- Clinical experience: specifically ask about use, products types, dosages, frequency
- Mitragynine and related compounds not detected in most standard tox screens
- Risk assessment difficult due to product variability
- Assess for potential interactions with co-use of substances and prescription medications
- No formal criteria for use disorder, clinicians have used 11 DSM-5 TR criteria for OUD

1. J Psychoactive Drugs. 2019 Jan-Mar;51(1):12-18. doi: 10.1080/02791072.2018.1562133.  
Image: Public domain image accessed at [https://commons.wikimedia.org/wiki/File:Kratom\\_Pills.jpg](https://commons.wikimedia.org/wiki/File:Kratom_Pills.jpg)

# Clinical effects of kratom



- Coffee-like stimulant properties with doses < 5 g<sup>1</sup>
- Sedation, analgesia with higher doses<sup>1</sup>
- In reported exposures to high doses of kratom, adrenergic-associated rather than opioid-associated symptoms predominate: nausea / vomiting, tachycardia, hypertension, tremor, seizures<sup>2</sup>
- Other substances used in most kratom-associated deaths; potential lethality disputed<sup>1,2</sup>
- Animal studies have demonstrated respiratory depressant effect of 7-hydroxymitragynine, not demonstrated with mitragynine<sup>2</sup>

1. Front Pharmacol. 2022 Mar 2;13:801855. doi: 10.3389/fphar.2022.801855.

2. Current Addiction Reports, 10(1), 9-28. doi:<https://doi.org/10.1007/s40429-022-00464-1>

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# Withdrawal from Kratom & Products



- Withdrawal symptoms may develop 12 to 24 hours after last use and persist up to 7 days<sup>1</sup>
- Clinical features appears similar to opioid withdrawal and COWS monitoring has been used<sup>1</sup>
- Withdrawal from 7-hydroxymitragynine and mitragynine pseudoindoxyl may have more severe symptoms
- Responsiveness to alpha-2 agonists (e.g., clonidine), buprenorphine<sup>1</sup>

1. J Psychoactive Drugs. 2019 Jan-Mar;51(1):12-18. doi: 10.1080/02791072.2018.1562133.  
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# Kratom Use Disorder Treatment Options



- Case reports & series: patients treated with oral & injectable buprenorphine, methadone<sup>1,2</sup>
- Maintenance doses for buprenorphine can be lower than typically prescribed for other opioids (e.g., 4 to 8 mg daily)<sup>1</sup>
- Heavier use of kratom may require higher doses of buprenorphine (reports of 12 to 16 mg daily)<sup>1</sup>
- Little guidance on treatment monitoring and duration

1. J Addict Med. 2021 Apr 1;15(2):167-172.

2. J Addict Med. 2026 Feb 12. doi: 10.1097/ADM.0000000000001666.

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# Kratom Perinatal Considerations<sup>1</sup>



- Limited data available
- Pregnant individuals may use as opioid alternative, for management of opioid withdrawal, and for mood symptoms
- Users may view as safer than pharmaceuticals, without appreciation for risks of toxic exposures, potential for neonatal withdrawal
- Case reports exist of using buprenorphine to treat kratom withdrawal during pregnancy

1. Obstet Gynecol. 2026 Jan 1;147(1):64-72. doi: 10.1097/AOG.0000000000006110.  
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# Take home pearls



- Use of kratom & related products have increased in a market notable for a lack of product consistency and safety
- Specifically assess patients for kratom & related product use, and counsel on safety issues from dependence, intoxication, and withdrawal
- If EMR permits, add kratom use to help spread awareness of use and alert about possible interactions
- Consider offering opioid agonist therapy for cases of use disorder

Image: Public domain image, Korthals, P.W., Kruidkunde [Verhandelingen over de natuurlijke geschiedenis der Nederlandsche overzeesche bezittingen; deel Botanie], t. 35 (1839-1842), accessed at [https://commons.wikimedia.org/wiki/File:Mitragyna\\_speciosa\\_\(Korth.\)\\_Havil.jpg](https://commons.wikimedia.org/wiki/File:Mitragyna_speciosa_(Korth.)_Havil.jpg)

# Thank You



Roan Highlands, North Carolina, photo by N. Erskine