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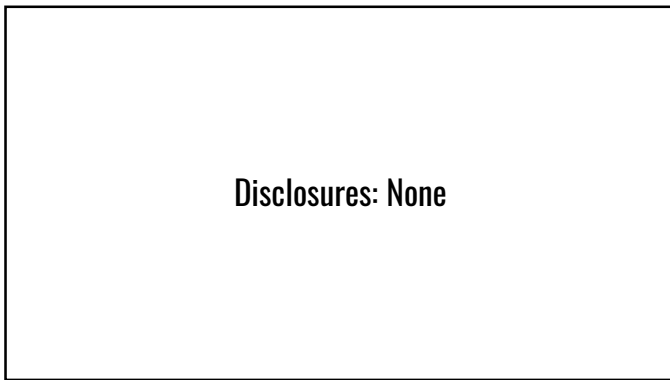
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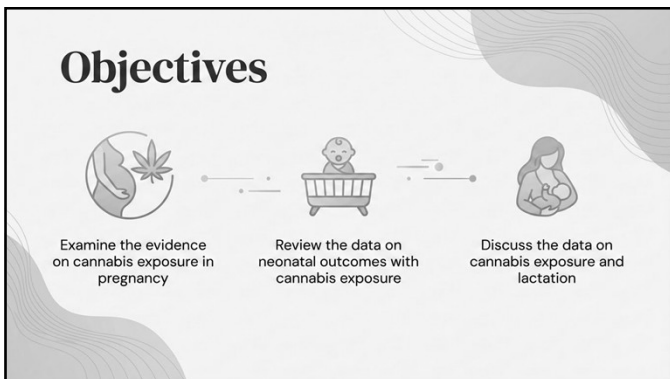
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
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# Outline

-  A review of cannabis basics
-  Cannabis epidemiology in the United States
-  Challenges with data on perinatal cannabis use
-  Data on cannabis and breastfeeding
-  Recommendations and resources

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# Cannabis or Marijuana?

**Marijuana**  
Used to boost support for drug prohibition by utilizing xenophobia and anti-immigrant sentiment

**Cannabis**  
Genus name



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# Cannabis

- Cannabinoids mediate medical and psychoactive properties
- Delta-9-tetrahydrocannabinol (THC)
- Increased dopamine release, altered mood and cognition



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**CB1**  
CB1 Receptors target:

- Motor activity
- Thinking
- Motor coordination
- Appetite
- Short term memory
- Pain perception
- Immune cells

**CB2**  
CB2 Receptors are much broader than CB1 and influence most of the body:

- Gut
- Kidneys
- Pancreas
- Adipose tissue
- Skeletal muscle
- Bone
- Eye
- Testes
- Reproductive system
- Immune system
- Respiratory tract
- Skin
- CNS
- Cardiovascular system
- Liver

Cannabis Education: All about Endocannabinoids — Consume Cannabis Blog<br/> — CONSUME

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# Cannabis

- THC – small, lipophilic
- Rapid distribution – brain and adipose
- Half life - 20 hours - 5 days
- Higher carbon monoxide levels than tobacco when smoked

Krening 2018

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Route of Administration	Inhalation	Oral
% Dose Consumed	~ 50% (loss due to pyrolysis)	100%
Trajectory to Circulation	Lungs – Bronchi-Bronchiole - Alveoli	Stomach – Small Intestines – Portal Vein - Liver
Other Factors Affecting Uptake	Intake upon inhalation (puff duration, intake volume, holding time)	Absorption (stomach contents, metabolic rate, genetic variants in CYP 450 enzyme activity, enzyme regulation by other drugs)
First-Pass Hepatic Metabolism	Bypassed	First-Pass Hepatic Metabolism by CYP450 enzymes
Bioavailability	2 – 56%	<20%
Onset	Immediate	30 – 90 minutes
Time of Peak Plasma	5 – 10 minutes	1 – 6 hours
Duration	2 - 4 hours	4 – 8 hours

**Nahtigal et al, 2017**

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### What about Medical Cannabis? Sera 2024

Table 2. The Evidence Base for Cannabisoid Therapy<sup>1,11,18,19</sup>

Level of evidence	Symptom/condition	Formulation(s) associated with therapeutic benefit			
		THC	CBD	THC:CBD (1:1)	Inhaled flower
Conclusive or substantial evidence of effectiveness • Strong evidence from RCTs (controlled) • Strong evidence from many (controlled or overall substantial) good-quality studies • Very low or no credible opposing findings	Chronic pain Chemotherapy-induced nausea and vomiting Multiple sclerosis-associated spasticity (patients reported symptoms) Insomnia associated with Lennox-Gastaut and Dravet syndromes	x		x	x
Moderate evidence of effectiveness • Several findings from good to fair-quality studies • Very low or no credible opposing findings • Some uncertainty due to chance or bias	Insomnia		x		
Limited evidence of effectiveness • Supportive findings from fair-quality studies • Mixed findings, with most showing effectiveness • Substantial uncertainty due to chance or bias No evidence or insufficient evidence • Mixed findings or a single poor-quality study or health outcomes have not been studied • No conclusion can be made due to chance or bias	HIV/AIDS-associated anorexia/weight loss Multiple sclerosis-associated spasticity (objective-measured symptoms) Symptoms associated with: • Tourette syndrome • Social anxiety disorder • Posttraumatic stress disorder Cancer Cancer-associated anorexia/weight loss/nausea Spasticity associated with spinal cord injury Substance use disorders (Opioids) Schizophrenia Symptoms associated with: • Huntington disease • Amyotrophic lateral sclerosis • Parkinson disease	x		x	x

CBD, cannabidiol; THC, delta-9-tetrahydrocannabinol.

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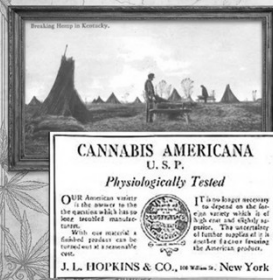
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### Cannabis History, United States, 1611-1911



- Hemp to US, Jamestown settlers
- Grown by President Washington and President Jefferson
- Included in US Pharmacopeia (1850)
- First outlawed in Massachusetts (1911)

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### Cannabis History, United States, 1937

- Push to tax cannabis to limit use
- American Medical Association opposed taxing, encouraged research



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# Perinatal Cannabis : Epidemiology

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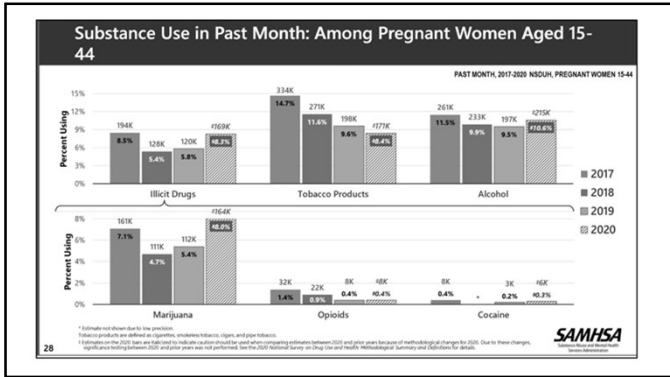
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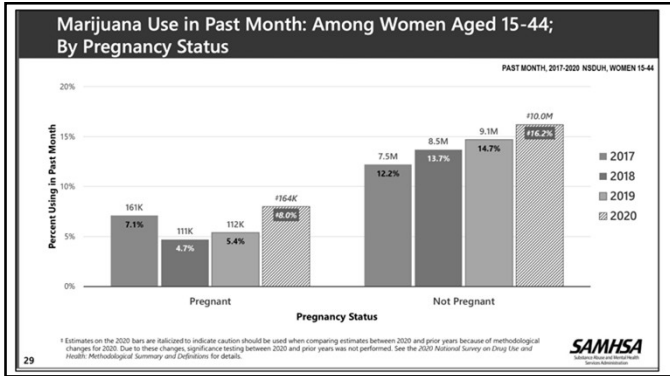
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### Data Challenges with Cannabis Outcomes



- ⚙️ Data remain limited due to funding
- ⚙️ Confounders
  - Polysubstance exposure
- ⚙️ Often self report
- ⚙️ Difficult to quantify amount of exposure
- ⚙️ Rising THC concentrations

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### Data Challenges with Perinatal Cannabis



- ⚙️ **Confounders**
  - Prenatal use
  - Second-hand smoke
  - Parenting with active exposure
- ⚙️ No long term information on isolated human milk exposure

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### Perinatal Cannabis - the data



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### Cannabis and Pregnancy

Effects of cannabis use on:

	Placenta	Fetus	Offspring
Paternal cannabis use		<ul style="list-style-type: none"> <li>Spontaneous abortion</li> <li>Low birth weight</li> </ul>	<ul style="list-style-type: none"> <li>Small for gestational age</li> <li>Sudden infant death syndrome</li> </ul>
Maternal cannabis use	<ul style="list-style-type: none"> <li>Altered placental epigenome and transcriptome</li> </ul>	<ul style="list-style-type: none"> <li>Preterm birth</li> <li>Low birth weight</li> <li>Altered fetal epigenome</li> </ul>	<ul style="list-style-type: none"> <li>Small for gestational age</li> <li>NICU admission</li> <li>Autism spectrum disorder</li> <li>Attention-deficit/hyperactivity disorder</li> <li>Psychoticlike experiences</li> </ul>

Lo, Hodges and Metz 2023

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TABLE 1 Cannabis impact on infant outcomes: Evidence from human studies

Timeline	Pregnancy	Breastfeeding
<b>Short term (&lt; 12 months)</b>	<ul style="list-style-type: none"> <li>Low birth weight<sup>1,2,3</sup></li> <li>Preterm birth<sup>4,5,6</sup></li> </ul>	<ul style="list-style-type: none"> <li>Decreased motor development<sup>7,8</sup></li> <li>Reduced height<sup>9,10</sup></li> </ul>
<b>Long term (&gt; 12 months)</b>	<p><b>18 months old</b></p> <ul style="list-style-type: none"> <li>Increases in:                             <ul style="list-style-type: none"> <li>Aggressive behaviour<sup>11</sup></li> <li>Attention deficit<sup>12</sup></li> </ul> </li> </ul> <p><b>3-4 years old</b></p> <ul style="list-style-type: none"> <li>Deficits in:                             <ul style="list-style-type: none"> <li>Verbal and perceptual skills<sup>13</sup></li> <li>Verbal, visual and quantitative reasoning<sup>14</sup></li> <li>Short term memory<sup>15</sup></li> </ul> </li> <li>Increases in:                             <ul style="list-style-type: none"> <li>Inoperativity, attention deficits and impulsivity<sup>16</sup></li> <li>Impaired vigilance<sup>17</sup></li> </ul> </li> </ul> <p><b>8-10 years old</b></p> <ul style="list-style-type: none"> <li>Deficits in:                             <ul style="list-style-type: none"> <li>Abstract reasoning<sup>18</sup></li> <li>Executive function<sup>19</sup></li> <li>Reading<sup>20</sup></li> <li>Spelling<sup>21</sup></li> </ul> </li> <li>Increases in:                             <ul style="list-style-type: none"> <li>Depressive and anxious symptoms<sup>22</sup></li> </ul> </li> </ul> <p><b>14-16 years old</b></p> <ul style="list-style-type: none"> <li>Deficits in:                             <ul style="list-style-type: none"> <li>Academic achievement<sup>23</sup></li> <li>Information processing speed<sup>24</sup></li> <li>Visual motor coordination<sup>25</sup></li> </ul> </li> </ul> <p><b>17-22 years old</b></p> <ul style="list-style-type: none"> <li>Deficits in:                             <ul style="list-style-type: none"> <li>Executive functioning<sup>26</sup></li> <li>Response inhibition<sup>27</sup></li> <li>Visuospatial working memory<sup>28</sup></li> </ul> </li> <li>Increases in:                             <ul style="list-style-type: none"> <li>Smoking and substance use<sup>29</sup></li> </ul> </li> </ul>	<p>Not studied</p>

<sup>1</sup>With use greater than once per week.  
<sup>2</sup>Cumulative literature.

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### Cannabis and Lactation

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### Key Questions

-  When are cannabis metabolites present in human milk?
-  Does isolated cannabis exposure through human milk have associated adverse infant/child outcomes?

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### Pharmacokinetics of Cannabis and Its Derivatives in Animals and Humans During Pregnancy and Breastfeeding

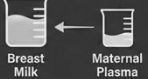
Availa Mackler<sup>1,2</sup>, Ema Farnesi<sup>1</sup>, Grigore Lucian<sup>1,2</sup> and Gregory Anton Lodginsky<sup>1,2</sup>



THC still present 4 hours after cannabis use



Case report of THC present in milk 6 days after use



THC and CBD concentrations 2x higher in breast milk than in maternal plasma

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### Human Milk Cannabinoid Concentrations and Associations with Maternal Factors: The Lactation and Cannabis (LAC) Study

-  Prospective study design
-  20 participants included:
  - Frequent cannabis use (> 1 / week)
  - < 6 months postpartum
  - Feeding infants 5+ times daily
  - No illicit substance exposure
-  **Data collection:** 5 milk samples collected after a single cannabis exposure event (following a 12-hour abstinence period).

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### Human Milk Cannabinoid Concentrations and Associations with Maternal Factors: The Lactation and Cannabis (LAC) Study



• THC peaked 120 minutes after a single use of cannabis



• The more often cannabis was used, the higher the THC concentrations at baseline and in post-use samples



• Bioaccumulation

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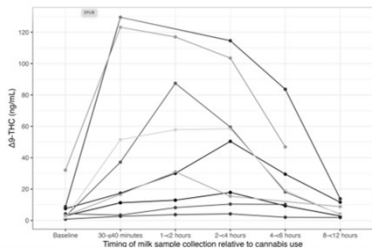
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### Human Milk Cannabinoid Concentrations and Associations with Maternal Factors: The Lactation and Cannabis (LAC) Study



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### Cannabinoid Hyperemesis Syndrome



Chronic cannabis exposure



Little relief with conventional anti-emetics



Cyclical vomiting, nausea and abdominal pain with abstinence



Improved with extended hydrothermotherapy

Kirby 2023

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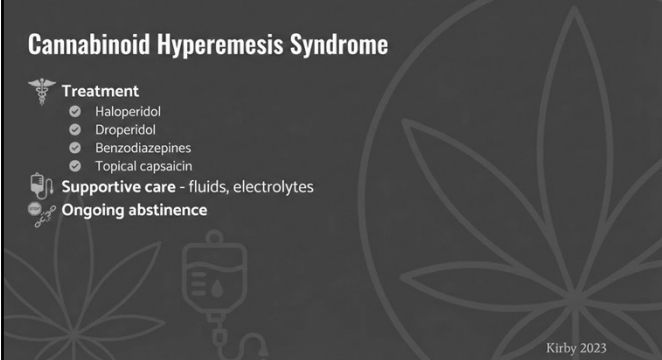
### Cannabinoid Hyperemesis Syndrome

**Treatment**

- ✓ Haloperidol
- ✓ Droperidol
- ✓ Benzodiazepines
- ✓ Topical capsaicin

**Supportive care** - fluids, electrolytes

**Ongoing abstinence**



Kirby 2023

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### Cannabinoid Hyperemesis Syndrome

**Rome IV diagnostic criteria**

Must include all of the following:

- Episodes of vomiting and nausea of less than 1-week duration
- ≥3 episodes within the last 12 months and ≥2 episodes within the last 6 months occurring at least 1 week apart
- Absence of vomiting between episodes
- ≥3 months with symptomatic onset occurring at least 6 months prior to diagnosis
- Chronic use of cannabis

Clinical characteristic	Frequency
Severe nausea and vomiting	100%
Cyclical pattern of vomiting occurring over multiple months	100%
Resolution of symptoms with cessation of cannabis consumption	96.8%
Compulsive hydrotherapy with symptom relief	92.3%
Abdominal pain	85.1%
History of regular cannabis use for ≥1 year	74.8%

Kirby 2023

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### What about CBD products?

- ✦ CBD detected in milk samples
- ✦ Small amounts
- ✦ Higher in smoking vs. edible formulations
- ✦ No information on infant/child outcomes after exposure



Yeung 2023

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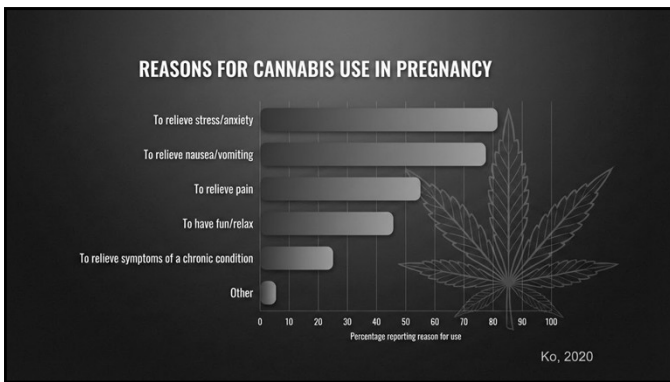
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**Reasons for cannabis use AFTER pregnancy**  
Smith 2024

**Most are treating a health condition :**

Depression

Anxiety

PTSD

Sleep disturbance

Chronic pain

- Most identify limited concern about cannabis use with lactation
- 90% report no or unhelpful advice from healthcare professionals

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### Perceptions of Cannabis Use and Its Benefits and Risks Among Breastfeeding Mothers

Zane Boerner,<sup>1\*</sup> Cristina Natha,<sup>2</sup> Teresa Baker,<sup>3,4</sup> and Christine D. Garner<sup>3,4</sup>

**98%** believed that cannabis was a safer alternative to medication for health concerns

Nausea Anxiety Depression Pain Low Appetite

- Perceived to have fewer side effects than medication

Sense of improved quality of life with use, including with parenting.

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### Healthcare professionals and counseling

Fatunbi 2024, Kitsanas 2024





→ Counseling was not standardized across all patients  
 → Increased counseling if younger, unmarried, and not identifying as white race

→ Limited counseling/resources on cannabis and breastfeeding

→ Limited awareness of impact of cannabis with human milk feeding

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### Is legal = safer?

In the context of legalization of cannabis use at the state level, does this confer a broader perception of safety during pregnancy and human milk feeding?

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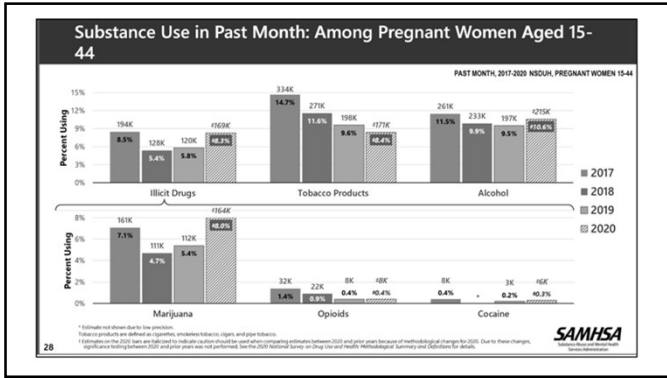
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**Legal here, but not at the federal level**

In the context of toxicology testing laws at birth for “non-prescribed use of a controlled substance”, how do we interpret cannabis?

In the context of prenatal substance exposure considered prenatal child abuse/neglect, how do we manage prenatal cannabis exposure in Minnesota?

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**Recommendations**

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## Organizational Recommendations *ACOG, AAP*



**Recommendation Against Use**

- Recommend against cannabis use while pregnant and during lactation, due to insufficient data.



**Shared-Decision Making Approach**

- Shared-decision making with medical cannabis therapy.

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Breastfeeding Medicine  
Volume 18, Number 10, 2023  
© 2023, Mary Ann Liebert, Inc., publishers  
<https://doi-org.ezp2.lib.umn.edu/10.1089/bfm.2023.29256.abm>



ACADEMY OF  
**Breastfeeding  
Medicine**

**ABM Protocol**

**Academy of Breastfeeding Medicine Clinical Protocol #21:  
Breastfeeding in the Setting of Substance Use and  
Substance Use Disorder (Revised 2023)**

Miriam Harris<sup>1,2</sup>, Davida M. Schiff<sup>3,4</sup>, Kelley Saia<sup>2,5</sup>, Serra Mutu<sup>3,4</sup>, Katherine R. Standish<sup>6</sup>,  
and Elisha M. Wachman<sup>2,7</sup>

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ACADEMY OF  
**Breastfeeding  
Medicine**

“In general, breastfeeding is recommended among mothers who stop non-prescribed substance use by the time of delivery”

(Does this include chronic cannabis exposure?)

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 **ACADEMY OF Breastfeeding Medicine**

- Cannabis: Shared-decision making, attempt cessation/reduction

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So, what do I say?

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### Talking about cannabis use



- Consider validated screening
- Provided compassionate feedback
- Ask what they know
- Ask for permission to share information and resources
- Prioritize the health of the dyad – don't forget the birthing person
- Consider alternatives

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### Tools for engagement

Respectful engagement: Antenatal counselling toolkit

- Explore obstacles and emotions**
  - Consensually explore patient perceptions, feelings and fears
  - Acknowledge existing barriers to accessing supports and assess readiness for change
- Reflection**
  - Reflect on previous parenting experiences
  - Identify positive and negative experiences antenatally, during parenthood and with healthcare providers
- Shame and stigma**
  - Address stigmatization, feelings of shame and hopelessness
  - Provide a non-judgmental and safe space for open communication
- Partnership and empowerment**
  - Explore patient-orientated goals and aspirations both antenatally and for parenthood
  - Establish ongoing supports to assist with attaining goals in early pregnancy
  - Acknowledge the inherent doctor-patient power imbalance and provide opportunities for patient-directed discussion about concerns and shared decision-making
- Ongoing support**
  - Offer culturally appropriate support and, if consensual, link in with hospital social worker
  - Foster familiarity and continuity of care with a supportive multidisciplinary team

Online Toolkit: [https://ceim.csiro.au/practice-kit/alcohol-and-other-drugs/working-with-expecting-and-new-parents/responding/respectful-engagement/#explore\\_her\\_fears\\_and\\_acknowledge\\_the\\_obstacles](https://ceim.csiro.au/practice-kit/alcohol-and-other-drugs/working-with-expecting-and-new-parents/responding/respectful-engagement/#explore_her_fears_and_acknowledge_the_obstacles)

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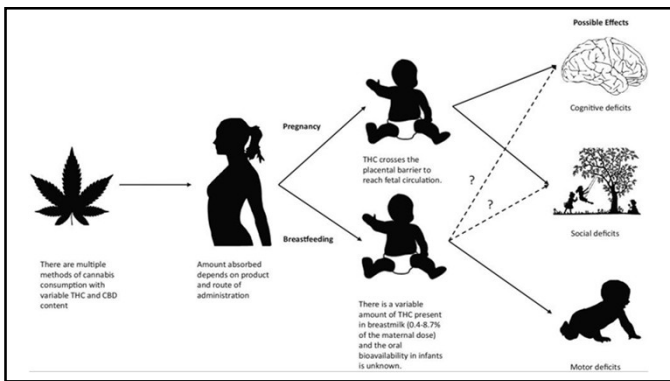
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### DSM-V Criteria – Cannabis Use Disorder

Categories of Symptoms

Symptoms of substance use disorders in the DSM-5 fall into four categories: 1) impaired control; 2) social problems; 3) risky use; and 4) physical dependence.

Impaired Control	Social Problems	Risky Use	Physical Dependence
Using more of a substance or more often than intended Wanting to cut down or stop using but not being able to	Neglecting responsibilities and relationships Giving up activities one used to care about because of their substance use Inability to complete tasks at home, school or work	Using in risky settings Continued use despite known problems	Needing more of the substance to get the same effect (tolerance) Having withdrawal symptoms when a substance isn't used

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### Perinatal Cannabis Exposure

**Cannabis metabolites cross the placenta and enter human milk, increasing with chronic use.**

**Research, especially on human milk feeding, is sparse.**

**Exposure may be associated with preterm birth, suboptimal fetal growth and altered infant neurodevelopment.**

**Shared-decision making and harm reduction are essential for optimal patient collaboration.**

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### Resources

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**Marijuana and Pregnancy** If you use marijuana during pregnancy, you may be putting your health and your fetus's health at risk.

**Possible Effects on Your Fetus**

- Disruption of brain cell growth
- Smaller size at birth, higher risk of stillbirth
- Higher chance of being born with a neural tube defect when in utero uses both marijuana and cigarettes during pregnancy
- Higher risk of stillbirth

**Possible Effects on You**

- Permanent long-term brain wiring
- Decreased ability to care for self or child
- Impaired judgment, putting you at risk of injury
- Increased risk of mental health issues

**Did you know?**

- Medical marijuana is not safer than recreational marijuana. Recreational and medical marijuana may be high in some strains, but both are high under federal law.
- There's no evidence that marijuana helps morning sickness (ask your doctor for other treatments).
- You also should avoid marijuana before pregnancy and while breastfeeding.

**Marijuana and pregnancy don't mix. If you're pregnant or thinking about getting pregnant, don't use marijuana.**

<https://patientgateway.massgeneralbrigham.org/mychart/profile/020305@WMA/Marijuana%20and%2005sheet.pdf>

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**Cannabis, You and Your Baby** With a baby, there are so many things to think about. This information can help you make the best choice for you and your baby.

**Fast Facts**

- Cannabis is not recommended to use while pregnant or breastfeeding.** Cannabis metabolites should be avoided while pregnant because they are present in your body. The more it stays in your body, the more it can affect your fetus.
- Components of cannabis can stay in the body after use of your body.** Cannabis metabolites can stay in your body for weeks or months after use. During pregnancy and breastfeeding, this means that the components can be passed to your fetus or baby.
- More use could cause more complications.** Studies show people who use cannabis more often or in larger amounts during pregnancy may have more complications, such as low birth weight babies, and your developing fetus may be at risk for developmental issues.
- There is a lot to be learned about the effects of cannabis on pregnancy.** The specific effects of cannabis on pregnancy and your developing fetus are still being studied. Research suggests that the effects of cannabis on pregnancy may be different for each individual.

**Cannabis use while smoking, vaping, eating, drinking, dabbing or use of cannabis (not including cannabis tinctures, CBD, THC, etc.) Cannabis is sometimes called many names, including marijuana, weed, pot and others.**

**Language of health: a baby's health, including improved parent self-care, directly translating to child health.**

<https://cdphe.colorado.gov/prevention-and-wellness/marijuana/marijuana-fact-sheets-in-multiple-languages>

Available in English, Spanish, Vietnamese, Korean, Chinese, Somali, and Arabic

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**HARM REDUCTION strategies for parents**

**Record how much you use.** This can help you reduce your use, even if that was not your original goal.

**Set limits on when and where you use.** Use only when you're sober or with a trusted friend.

**Make a list of the risks and benefits of stopping.** Consider your health, your family, and your future.

**Avoid going opioid, alcohol, or other depressants.** These substances can be dangerous when you are sober or feeling vulnerable.

**Switch to a safer method,** which might be different for each substance. For example, taking a pill is safer than injecting heroin, but it is easier to control your dose of cannabis with smoking rather than eating edibles.

**Set personal limits on what you use.** When you use, and how much you use. For example, don't combine substances, or plan to have no more than 2 drinks over 2 hours.

**Make a safety plan before you drive.** For example, arrange transportation so you don't need to drive.

**Make a parenting plan before any substance use,** including alcohol use. Arrange for help with childcare. Know what you'd do in an emergency.

**Attend support groups** like Maternal Management, SMART Recovery, NA, or AA. Look for peer support.

**Take good care of your body and mind.** Eat healthy foods. Get enough sleep. Exercise. Drink water.

**perinatalharmreduction.org**

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Thank You!

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