British Columbia Lactation Consultants Association (BCLCA)

Cannabis Use and Lactation

The goal of this document is to provide an unbiased look at what is known about cannabis use in lactation.

It is important to note that cannabis/lactation research to date has focused on inhalation via smoking of THC. Very little is known about other methods of ingestion and other products. Given this limitation, the intention of this report is to provide an overview of our current understanding about THC transfer to human milk and some of the known and hypothesized implications. We also include summary recommendations from credible sources. At BCLCA, we encourage families to thoughtfully consider their own situation in the context of reliable, up-to-date information and to work closely with trusted healthcare providers.

The Endocanabinoid System (ECBS)

The human body has a molecular signaling system, called the endocannabinoid system (ECBS), that has a variety of important regulatory functions in the human body. The ECBS produces many chemical compounds, called endocannabinoids, that act on receptors throughout the body. Researchers have identified two cannabinoid receptors in the body: CB1, predominantly present in the nervous system; and CB2, predominantly found in the immune system and its associated structures (Mackie, 2008). Many tissues contain both CB1 and CB2 receptors, as each are linked to a different action. It is now understood that the endocannabinoid system (ECBS) influences the brain and nervous system including their development, immune function, inflammation, appetite, metabolism and energy, homeostasis, cardiovascular function, digestion, bone development and bone density, synaptic plasticity and learning, pain, reproduction, psychiatric disease, psychomotor behaviour, memory, wake/sleep cycles, and the regulation of stress and emotional state/mood (LLLI, 2019; Government of Canada, 2018).

Phytocannabinoids

More than 100 cannabinoids, called phytocannabinoids, have been identified in the cannabis plant (National Institute of Health, 2019). Phytocannabinoids are plant substances that are ingested and not naturally occurring in the body. Many phytocannabinoids lock into the same receptors that are acted upon by naturally produced endocanabinoids, and therefore affect the same systems (listed above) as the ECBS (LLLI, 2019; Government of Canada, 2018).

To date, research on cannabis phytocannabinoids has largely focused on delta-9-tetrahydro-cannabinol (THC), the principal phytocannabinoid responsible for the

psychoactive effects of cannabis. In addition to its interaction with the endocannabinoid system, THC interacts with the body through the dopamine, opioid, GABA, glutamate and serotonin-associated systems (Mourh and Rowe, 2017).

As information about how the drug metabolizes is primarily available about the THC component of cannabis, THC is the focus of this document.

Medical Cannabis

Medical Cannabis (sometimes known as *Medical Marijuana*) is a general term and commonly refers to cannabis in any form, used for the purposes of medical or therapeutic treatment. Because it is not specific, the term may refer to the whole, unprocessed cannabis plant (of which there are multiple varieties), one or more of the components of the plant, such as cannabidiol (CBD), or synthetically derived products.

CBD is a non-psychoactive phytocannabinoid that engages the body's endocannbinoid system and may be used for a wide range of medicinal purposes. Depending on the condition being treated, non-psychoactive CBD may be combined with varying amounts of psychoactive THC for an enhanced medicinal effect (Government of Canada, 2018). Unless products are pharmaceutically sourced, it is difficult to reliably and accurately know the types and dose of active ingredients. If cannabis (as THC, CBD or a combination of both) is being considered as part of a treatment plan, it is helpful to consult with a healthcare provider that is knowledgeable about cannabis use during lactation.

How Cannabis Distributes Throughout the Body

When cannabis is inhaled, THC rapidly enters plasma through the lungs and then quickly passes into the brain and central nervous system, resulting in psychoactive effects that last for about two hours. Dosing is highly variable when cannabis is smoked (due to differences in number, duration, and spacing of puffs, hold time, and inhalation volume) and the amount of THC ingested can differ even between the same user at different times (Huestis, 2007).

After ingestion, as the plasma circulates through the liver, THC levels in plasma decrease rapidly (Huestis, 2007). THC is highly lipophilic and initially taken up by tissues that are highly vascularised, such as the lung, heart, brain, and liver (Huestis, 2007). From there, THC and its metabolites accumulate and are stored in muscle and fatty tissue, and are slowly released over time (Hale, 2019; Baker, 2018; Government of Canada, 2018). This release from muscle and fat back into the plasma occurs over days to weeks, depending on the extent of use (Lactmed, 2019). THC has been found in

human milk tested six days (Bertrand et al., 2018) to six weeks (Wymore et al., 2018) after reported use. Because metabolites remain in the body much longer than the original form of the drug, drug tests usually test for metabolites (Moeller et al, 2017; Government of Canada, 2018).

Neurobehavioral Effects of Cannabis on Adults

As the psychoactive component of cannabis, THC is responsible for the 'high' or intoxicating effects on the central nervous system (CNS) that last for approximately two hours (Baker et a., 2018). Pleasurable effects of cannabis are usually described as a feeling of elation or amusement, followed by a sense of calm, an increase in appetite, and relaxation (Hill & Reed, 2013). Additionally, some people might have negative effects such as anxiety and dysphoria (Government of Canada, 2018).

THC can alter a parent's perception of and their ability to react to changes in the environment, impacting the parent's caregiving capacity. In addition to the psychoactive effects, drowsiness can occur as a result of generalized CNS depression (Government of Canada, 2018), which may have implications for families that share a sleep surface.

It may be especially relevant to the lactating parent that animal studies indicate that cannabis can decrease prolactin levels (Hale, 2019; Mourh & Rowe, 2017). Although there is a lack of data demonstrating an impact for THC on milk production, this may be a particularly important consideration in the early days after birth, as prolactin is known to play an important role in establishing milk production during this sensitive period.

For general information about cannabis use while parenting, families can review the ***Thinking about using cannabis while parenting*** section of the Government of Canada website: https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/health-effects/parents.html

Transfer of THC into Human Milk

The process of THC transfer into human milk is dependent on many factors, including the user's age, gender and method of ingestion (inhaled, oral, topical), and frequency/duration of use (Best Start, 2019). Recent research indicates that an average of 2.5% (actual range 0.4 - 8.7%) of the maternal THC dose is transferred into human milk (Baker et al., 2018; Hale et al., 2018).

The Baker and Hale research team undertook an important study that contributed to our knowledge on transfer of THC into human milk. This study was prospective, did not rely on self-report, and specified the amount of THC ingested, (in both potency and amount),

and measured the THC milk levels of eight lactating mothers over regular time intervals after they had abstained from any cannabis in the previous 24 hours and then smoked 0.1 g of cannabis containing 23.3% THC.

THC levels were detected in the milk as early as 20 minutes after inhalation, peaking at about one hour (average level of 94 ng/mL) after inhalation, and at 4 hours, the longest interval measured post inhalation, an average level of 26 ng/mL (actual range 4.7 - 67.2 ng/mL) (Baker et al., 2018). This means that at 4 hours, based on the average transfer (26 ng/mL), the infant dose is calculated to be 130 nanograms (ng) in 100 cc of milk, compared with an adult dose of THC which is 23,000,000 nanograms (Dr. Hale, personal communication, August 8, 2019).

Preliminary data suggests that THC transfer into human milk also varies considerably when occasional use is compared to regular, chronic use (Bertrand et al., 2018). Suggestively, the Baker and Hale research team found that a participant who regularly used at a dose and frequency higher than others in the study also had milk levels that were three times higher despite abstaining prior to testing (Baker et al., 2018; Hale et al., 2018). Similarly, an older published report of a single case involving a lactating mother who smoked cannabis multiple times per day found that she produced milk with THC levels eight times higher than maternal plasma level (Perez-Reyes & Wall, 1982), suggesting that regular, chronic use may result in higher human milk transfer.

Amount transferred for any substance is dependent on the potency (concentration) of the active ingredient. A challenge of real world use of cannabis may be that it may be difficult to reliably and accurately know the concentration and the presence of unknown active ingredients depending on the source. A general trend is that from 1995 to 2014, the average concentration of THC in cannabis has risen from 3.96% (+/- 1.82%) to 11.84% (+/- 6.60%) (Mourh & Rowe, 2017). With legalization, the federal government aims to quantify active ingredients and label products that are sold through approved outlets (Government of Canada, 2018), which will add a measure of reliability.

Infant Absorption of THC from Human Milk

As discussed above, an average of 2.5% of the lactating parent's THC intake will end up in their milk (Baker et al, 2018). Data on the bioavailability once ingested by the baby – how much the baby will actually absorb from the milk ingested – is lacking. Evidence indicates that the systemic bioavailability via oral ingestion for adults is somewhere between 4-12% (Hale, 2019). However, the extent of oral absorption in breastfeeding infants, the differences in metabolism and accumulation patterns, and pharmacologic

effects of even low levels of cannabinoids on neurodevelopment in infants are all unknown (Bertrand et al., 2018).

It is hypothesized that THC enters the infant's plasma and is distributed through the body as described earlier for adults, which involves metabolic conversion via the liver. However, it is important to note that the newborn liver is not mature and will be much less able to metabolize THC than the liver of an adult or older child (Mourh & Rowe, 2017). Therefore, there is more risk for greater circulating levels of THC with a younger infant versus an older nursing child.

Infants and children who ingest milk from mothers who have used cannabis may have detectable THC metabolites in their fecal and urine samples for long periods of time depending on the method of testing used (Mourh and Rowe, 2017). Additionally, continuous daily exposure could result in greater accumulation of the various cannabinoids in the child because of slow elimination from body fat stores (Bertrand, 2018).

Finally, it is important to consider the potential for passive inhalation of smoke from the child's environment. This may be especially significant in relation to risk for sudden infant death syndrome (Mourth and Rowe, 2017), which is discussed in more detail below.

Effect of Cannabis on the Infant

Infancy is a critical time for brain development. The short and long term effects of cannabis exposure through human milk feeding, including effects on neurodevelopment, are yet unknown. Contemporary, high quality research is only just beginning and unfortunately studies will not be completed for some time.

Two often cited studies on this issue have methodological limitations. In a longitudinal study, Astley and Little (1989) found reduced motor development using the Bayley scale at one month; however, the cannabis-exposed through lactation group did not exclude prenatal exposure or exposure to other substances. Additionally, their definition for lactation was "breastfed for at least two weeks with less than 16 ounces of supplemental formula per day".

Another longitudinal study (Tennes et al.,1985), examined 61 babies exposed to cannabis through breastfeeding, was similarly confounded by including prenatal exposure to cannabis and did not define breastfeeding. However, this study found no statistical difference in Bayley scores between users and non-users at one year of age.

Although there is a lack of quality evidence demonstrating negative long-term neurodevelopmental effects of cannabis exposure ingested through human milk, there remains concern since THC and its metabolites easily enter tissues of the brain during a sensitive time for brain development (Ryan, 2018).

Another potential infant effect is the concern that exposure to cannabis may increase sudden infant death (SIDS) risk. One case control study matched 239 infants who died of SIDS with controls and found that maternal recreational drug use during pregnancy, including cannabis, was not associated with SIDS when adjusted for other risk factors such as poverty and concurrent alcohol use (Klonoff-Cohen & Lam-Kruglick, 2001). The number of breastfeeding participants (n=3) was insufficient to allow researchers to calculate specific breastfeeding-related effects.

However the same study noted a statistically significant difference between case and control fathers' use of cannabis during pregnancy (OR=2.0; 95% CI, *P*=.05) and the postnatal period (OR=2.8; 95% CI, *P*=.04). These results indicate that a father's use may increase SIDS risk, which may be relevant in assessing the risk/benefits of an individual family situation, taking into account the well-established protective effect of breastfeeding against SIDS (Task Force on Sudden Infant Death Syndrome, 2016).

Recommendations from Clinical and Professional Guidelines

There are significant known positive health, psychological and physiological effects of breastfeeding for both the baby and the mother, and significant known risks of formula use for the baby. This knowledge informs current recommendations.

There is some variance in messaging from various health professional and clinical practice standards. The general consensus, however, is that in the absence of evidence, abstinence is suggested as the preferable option. If this is not possible, breastfeeding should continue while minimizing cannabis use and infant exposure.

> **Academy of Breastfeeding Medicine** (2015) "at this time, although the data are not strong enough to recommend not breastfeeding with any marijuana use, we urge caution."
>
> **American Academy of Pediatrics** (2018) "present data are insufficient to assess the effects of exposure of infants to maternal marijuana use during breastfeeding. As a result, maternal marijuana use while breastfeeding is discouraged. Because the potential risks of infant exposure to marijuana metabolites are unknown, women

should be informed of the potential risk of exposure during lactation and encouraged to abstain from using any marijuana products while breastfeeding."

American College of Obstetrics and Gynecology (2017) "insufficient data to evaluate the effects of marijuana use on infants during lactation and breastfeeding, and in the absence of such data, marijuana use is discouraged."

Best Start (2019) "breastfeeding is still the healthiest choice for your baby. Until further information about the potential harms is available, it is recommended that women stop using cannabis while they are pregnant or while breastfeeding. Caution is advised

Hale (2019) "While [the] data poses numerous limitations, and does not directly examine the benefits of breast milk versus risks of exposure to marijuana in milk, cannabis use in breastfeeding mothers should be discouraged at this time. Healthcare professionals should encourage alternative treatment options for maternal health conditions requiring the use of marijuana."

LACTMED (2019) "in general, professional guidelines recommend that cannabis use should be avoided by nursing mothers, and nursing mothers should be informed of possible adverse effects on infant development from exposure to cannabis compounds in breastmilk".

The Society of Obstetricians and Gynaecologists of Canada (2019) "until we have more definitive answers, not using cannabis or CBD during pregnancy or when breastfeeding is the safest option for you and your baby".

Going Forward

Canada's federal funding agency for health research has developed an Integrated Cannabis Research Strategy and has recently made available significant funding for cannabis research on a number of topics. Neurodevelopmental outcomes associated with exposure through maternal cannabis use, including breastfeeding, is one of the identified research priorities (Canadian Institutes of Health Research, 2019).

New research is needed to address the serious lack of rigorous data on many issues related to lactation and cannabis: clinical effects of THC and other cannabis compounds on the infant exposed to cannabis; the effect of occasional vs. frequent use on THC transfer into milk; transfer into milk across the various methods of ingestion;

identification and contribution of confounding factors; and assessment of long-term psychological, neurobehavioral, physiological, and developmental outcomes in human infants.

Current and future research will continue to develop our knowledge and provide additional clarity regarding these and other important questions about the effect of cannabis exposure on the human infant.

Making Decisions about Cannabis Use During Lactation

In the context of personal patterns of use, families are encouraged to review available information carefully. Some families might find the following questions helpful:

- What are my reasons for use? Are there other ways to address those needs that present less risk?
- Are there ways to cut down my use? Is it possible to use a less potent product (preferably one without tobacco) and use less often?
- If I decide to use, how can I reduce exposure to my infant and/or child? How can I ensure that caregiving for my infant remains responsive and safe?
- Are there risks of exposure to my infant from our family environment? If so, how might I reduce those risks?

Many families have found it valuable to speak to a knowledgeable healthcare provider in more detail about the specifics of their situation. Families should expect to receive non-judgmental, respectful support as they make informed decisions about lactation and cannabis use.

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Prepared by:

Tina Revai, MN, BScN, IBCLC, LLLC-L

Sandra Yates, BSc, LLLC-L, retired IBCLC

Editing help by:

Ingrid Tilstra, IBCLC, LLLC-L

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