GUIDELINE

Canadian Pediatric & Perinatal HIV/AIDS Research Group consensus recommendations for infant feeding in the HIV context

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BACKGROUND: Providing comprehensive infant feeding guidance to families affected by HIV is complex and requires a multidisciplinary approach. While exclusive formula feeding remains the preferred recommendation for infants born to women living with HIV (WLWH) in high-income countries, a more nuanced approach that may include the option of breastfeeding under certain circumstances is emerging in many resource-rich countries. **METHODS:** The Canadian Pediatric & Perinatal HIV/AIDS Research Group (CPARG) hosted a Canadian Institute of Health Research-funded meeting in 2016 to develop consensus among multidisciplinary providers around counselling and recommendations for infant feeding. After presentations by adult and paediatric health care providers, basic scientists, and community-based researchers, a subgroup drafted summary evidence-informed recommendations. Along with revisions among CPARG members, a community review was performed by a convenience sample of WLWH who had given birth in the past 5 years from Ontario and Quebec. A legal review was also conducted to ensure understanding of the criminalization potential and concern of HIV transmission and exposure. **RESULTS:** The Canadian consensus guidelines continue to support formula feeding as the preferred method of infant feeding as it eliminates any residual risk of postnatal vertical transmission. Formula should be made available for all infants born to mothers living with HIV for their first year of life. A comprehensive approach to counselling WLWH is outlined to assist providers to effectively counsel on current evidence to ensure WLWH are fully informed in their decision making. For women meeting criteria to and elect to breastfeed, frequent maternal virologic monitoring and follow-up is required of both mother and infant. Antiretroviral prophylaxis and monitoring are recommended for breastfed infants. The community review highlighted the importance of other supports and counselling needed for implementing effective formula feeding, aside from access to formula. The legal review provided clarifying language around child protection services involvement and the need to provide referral to legal resources or information upon request. Surveillance systems to monitor for cases of breastmilk transmission should be in place to improve gaps in care and develop further knowledge in this area. **CONCLUSION:** The Canadian infant feeding consensus guideline is designed to inform and enable better care for WLWH and their babies. Ongoing evaluation of these guidelines as new evidence emerges will be important.

KEYWORDS: breastfeeding, breastmilk, HIV, HIV transmission, infant feeding

HISTORIQUE : La transmission de conseils détaillés sur l'alimentation du nourrisson aux familles touchée par le VIH est complexe et exige une approche multidisciplinaire. Il est recommandé de recourir exclusivement aux préparations commerciales chez les nourrissons de mères vivant avec le VIH (MVIH) dans les pays à revenu élevé, mais une approche plus nuancée, qui peut inclure l'allaitement dans certaines situations, émerge dans de nombreux pays riches en ressources. **MÉTHODOLOGIE :** Le Groupe canadien de recherche pédiatrique et périnatale sur le VIH/sida (CPARG) a tenu un congrès financé par Les Instituts de recherche en santé du Canada en 2016 pour parvenir à un consensus de la part des professionnels multidisciplinaires sur le counseling et les

recommandations à l'égard de l'alimentation du nourrisson. Après les présentations de professionnels de la santé pédiatrique, de chercheurs fondamentaux et de chercheurs communautaires, un sous-groupe a rédigé une synthèse des recommandations reposant sur des données probantes. En plus des révisions proposées par les membres de la CPARG, un échantillon de commodité de MVIH qui avaient accouché dans les cinq années précédentes en Ontario et au Québec a procédé à un examen communautaire. Une révision juridique a également permis de bien comprendre le potentiel de criminalisation et les inquiétudes quant à la transmission du VIH et à l'exposition à ce virus. **RÉSULTATS :** Les lignes directrices consensuelles canadiennes continuent de préconiser l'utilisation des préparations commerciales pour l'alimentation des nourrissons, car elles éliminent tout risque résiduel de transmission verticale après la naissance. Ces préparations doivent être mises à la disposition de tous les nourrissons nés de MVIH jusqu'à l'âge d'un an. Une approche détaillée du counseling auprès des MVIH est présentée pour aider les professionnels à leur donner des conseils efficaces sur les données probantes à jour, afin qu'elles puissent prendre une décision pleinement éclairée. Chez les femmes qui respectent les critères et qui choisissent d'allaiter, la surveillance virologique fréquente de la mère et un suivi de la mère et du nourrisson s'imposent. La prophylaxie antirétrovirale et la surveillance des nourrissons allaités sont recommandées. La révision communautaire a fait ressortir l'importance d'autres mesures de soutien et de counseling pour mettre en place une alimentation efficace à l'aide des préparations commerciales, en plus de l'accès à ces préparations. L'analyse juridique a permis de préciser les énoncés entourant la participation des services de protection de l'enfance et la nécessité de diriger les familles vers des ressources ou de l'information juridiques, sur demande. Des systèmes de surveillance visant à répertorier les cas de transmission par le lait maternel devraient être en place pour corriger les lacunes en matière de soins et accroître les connaissances dans ce domaine. **CONCLUSION :** Les lignes directrices consensuelles canadiennes sur l'alimentation des nourrissons sont conçues pour éclairer les soins aux MVIH et à leurs nourrissons et pour les améliorer. Il sera important d'assurer l'évaluation continue de ces lignes directrices à mesure que de nouvelles données probantes seront découvertes.

MOTS-CLÉS : alimentation du nourrisson, allaitement, lait humain, transmission du VIH, VIH

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INTRODUCTION

Exclusive formula feeding remains the preferred recommendation for infant feeding in the HIV context in resource-rich settings as it is the only strategy that completely eliminates post-partum HIV transmission risk (1–3). However, with the emergence of data from low-resource settings demonstrating that antiretroviral therapy (ART) can significantly reduce (but not eliminate) the risk of vertical transmission through breastmilk, the need for consensus recommendations specific to the Canadian context has become apparent.

With the provision of combination ART to women during pregnancy, intravenous zidovudine treatment during labour, and 4–6 weeks of oral zidovudine prophylaxis for the newborn along with exclusive formula feeding, vertical HIV transmission has declined significantly in high-resource countries to 0.27%–2.9% (4–8). Literature to date estimates the risk of breastmilk transmission to be low (<1% to 5%) but not zero, even if a woman is on ART and has an undetectable viral load, and optimal risk reduction measures for maternal and infant health are maintained (9–13). At the present time, there are very limited reliable published

data on the risk of HIV transmission through breastmilk in mothers who have been on effective ART with sustained virologic suppression over a prolonged period of time. However, it is anticipated that the risk of breastmilk transmission in this context would be low (<0.5%).

Recognizing a growing community of women and families affected by HIV who are choosing breastfeeding[1] for their infants, a group of experts from the United States and Canada published a consensus statement on HIV and infant feeding (14). Among other recommendations, the statement called for an increase in resources available to providers who support families affected by HIV to ensure families are making fully informed, autonomous decisions (14).

In response to the current state of evidence and advocacy in this area, these recommendations were developed by Canadian medical experts in the field by consensus, and after discussion and consultation with women living with HIV and AIDS Services Organizations (ASOs) serving these families.

FOREGROUNDING WOMEN'S EXPERIENCES IN THE CANADIAN CONTEXT

Infant feeding practices vary across individuals, families, communities, and cultures. They are informed by myriad factors including age, education level, culture, ethnicity, social location, beliefs, parenting philosophy, and the desire for choice and autonomy. Research has described the acute and permanent grief, feelings of loss, and ongoing sadness some mothers living with HIV feel when they cannot breastfeed their infants (15,16). These experiences are rarely validated outside of the immediate post-partum period (15,17). Understanding the short- and long-term impacts infant feeding decisions can have on the mother, infant, and relationships is important when providing ongoing support for families affected by HIV. Collaboration with women living with HIV has highlighted the gap between a woman's experiences of infant feeding counselling in the Canadian context and their providers' understanding of that clinical interaction (16). Women living with HIV appear to prioritize evidence-based counselling, followed by the opportunity to make an informed decision about their preferred infant feeding method. Some women may not be fully informed about the risk of vertical HIV transmission, the reasons why recommendations differ between low- versus high-resource settings, how to bond with their infants in ways other than breastfeeding, and methods to suppress lactation or ways to communicate to others why they are not breastfeeding without fearing involuntary HIV disclosure. As such, women living with HIV require clear communication on transmission and other risks, options where choice can safely exist, and a nonjudgmental, unbiased approach when offering counselling and support on infant feeding choices.

Based on the best available evidence—including a comprehensive review of the current literature, taking into account the needs identified by women living with HIV in Canada, and in consideration of other relevant documents—the purposes of this guidance document are to: (1) provide recommendations for counselling women on infant feeding in the HIV context; (2) delineate clinical management strategies for when women living with HIV decide to breastfeed their children; and (3) review evidence on breastmilk transmission of HIV. This document summarizes clinical care recommendations and includes counselling and breastfeeding resources, the supplementary material reviews the evidence for these recommendations in detail, and the appendix includes dosing guidelines, additional background information, an example of an agreement that can be signed for families that decide to breastfeed, and a legal consultation on current laws, rights, and HIV in the context of infant feeding.

RECOMMENDATIONS

Recommendation 1: Exclusive formula feeding is the recommended method for feeding infants born to women living with HIV in Canada.

Exclusive formula feeding is the most effective infant feeding method to prevent HIV transmission in the post-partum period. It is important to note that not being able to breastfeed may come with significant emotional, social, and psychological stressors and challenges for the woman and her family. It is important to situate this recommendation in the knowledge that among the general population in Canada only 12.7% of mothers report not initiating breastfeeding for a variety of reasons (18). This is distinctly different from the patterns in women living with HIV, who are recommended to not initiate breastfeeding in the Canadian context. We emphasize the importance of appropriate, trauma-informed, and culturally inclusive support to help women cope with any impacts they may experience from not breastfeeding. Following comprehensive unbiased counselling about infant feeding in the

[1] References to and recommendations for 'women' in this document should also be considered to apply to other parents who gestate a fetus but do not identify as 'women', including transgender men and non-binary people. Similarly, while nursing a baby is often referred to as 'breastfeeding', this terminology may not apply to all nursing parents for whom the term 'chestfeeding' or 'bodyfeeding' may be the appropriate terms.

context of maternal HIV, providers must understand the beliefs and goals women have concerning their infant feeding choices to adequately counsel them around options to optimize their child's health and well-being. Women and families must feel secure in voicing their beliefs and goals concerning infant feeding choices to develop care partnerships for the mother, infant, and families. In some situations, exclusive formula feeding may not be the method of feeding selected for a particular family; such a decision should ideally be made after a thorough discussion with care providers and a full understanding of the risks and implications for the child and family in both the short and long terms.

Recommendation 2: Free formula should be made available for all infants born to mothers living with HIV for the first year of life.

Infant formula is available in most areas of the country at no cost and its exclusive use eliminates the possibility of breastmilk transmission of HIV. The provinces which at this time do not have a provincially funded formula program include the Yukon Territory, the Northwest Territories, Nunavut, Prince Edward Island, Newfoundland, Nova Scotia, and New Brunswick. While free formula improves its availability to families affected by HIV, accessibility is contingent on many additional factors such as geography and transportation barriers, access to clean water, disclosure imperatives, pharmacy knowledge and support, formula varieties available, and the acceptability of formula for infant nutrition among nuclear and extended families. Canadian Pediatric & Perinatal HIV/AIDS Research Group (CPARG) and others involved in the care of women living with HIV and their children in Canada advocate that all women living with HIV have access to free formula for their infants and removal of any barriers to access that may be encountered as exclusive formula feeding continues to be the preferred clinical recommendation for infants of women living with HIV. Solutions may include delivery of formula, free bottles and supplies, distilled water, teaching how to prepare formula and necessary support to formula feed, especially for women living in shelters, on Indigenous reservations, or in remote areas. For parents without access to safe water for preparing formula, tailored solutions should be made available (eg, use of ready-to-feed formula, or supplying distilled water for mixing concentrate or powdered formula). Parents facing additional access barriers as noted in the previous recommendation should also receive tailored solutions to support their access to the formula if desired.

Recommendation 3: All women living with HIV should benefit from detailed multidisciplinary counselling about infant feeding well in advance of delivery by adult HIV, paediatric HIV, and pre-natal care providers.

Care providers should engage all families in a dialogue to answer any questions about infant feeding options, and understand motivations for choosing a specific feeding method, all the while doing so in a nonjudgmental manner. When multidisciplinary care is not available within a woman's community, opportunities for virtual consultation and/or support for travel to a site where multidisciplinary care is available, should be sought.

The consultation should include:

- A person-centred and trauma and violence aware approach to counselling and support
- Understanding the woman's knowledge of the risks and benefits of breastfeeding versus exclusive formula feeding in the HIV context
- Understanding the woman's current plans regarding infant feeding, and the reasons for those plans
    - For women who wish to breastfeed solely for the immunologic and maternal benefits, the exploration of expressed breastmilk banks may be considered. However, it must be recognized that this may not be feasible as there is limited availability of expressed breastmilk banks in Canada.
- Assess for psychological stressors including pressures to breastfeed from family or friends, stressors anticipated post-partum, and support available to the mother
- Providing clear explanations and counselling on breast milk transmission and risk, differences in guideline based on setting, types of infant feeding, use of donor milk, ART medication for infant and monitoring, aspects of counselling for formula and breastfeeding (Table 1)
- Practical considerations include what to expect in the hospital—messaging in 'breastfeeding friendly' hospitals, how a mother can advocate for her infant feeding choice and confidentiality in HIV management and discussions.
- Resources to support counselling related to infant feeding (available in the Resources section)
- Providers should document the counselling discussion in clear, accurate and unbiased terms as a record of the decision-making process for future reference for both the provider and patient. Providers should ensure the woman and her support persons have a full understanding of the clinical care requirements for both mother and infant in the breastfeeding context and the importance of adhering to requirements. If the health care team

Table 1: Infant feeding information and counselling topics to be clearly explained to women living with HIV

Guidelines and the science of HIV transmission through breastmilk	The differences in WHO guideline recommendations based on context (low versus high resource settings)
	Risk of HIV transmission with breastfeeding including a review of risk factors that could increase the risk of transmission such as detectable maternal viral load, incomplete ART adherence, breast issues (engorgement, nipple bleeding/cracking, etc.), infant oral mucosa or gut inflammation (due to mixed feeding) or infection (eg, thrush)
	Biological aspects of HIV transmission through breastmilk including the roles of cell-free and cell-associated viruses and differences in viral load in serum versus milk. The variability in excretion of different antiretroviral medications into breastmilk and their potential for toxicity or induction of HIV resistance should also be discussed (20; see Appendix 1)
Types of infant feeding including exclusive formula (recommendation), exclusive breastfeeding, and mixed feeding	For women *who choose to breastfeed*, exclusive breastfeeding is recommended until weaning is initiated *Mixed feeding* should generally be avoided or minimized as early research suggested that mixed feeding carries a higher risk of breastmilk transmission to infants. It should be noted, however, that there is a paucity of data on the risk of transmission with mixed feeding when mothers are virologically suppressed on combination ART during breastfeeding
	In situations where the primary reason for wanting to breastfeed is because of the perceived *nutritional or immunologic benefits of breastmilk*, obtaining breastmilk through banked donor milk programs can be explored
	In scenarios where wet nurses are a cultural tradition, consider acquiring breastmilk from a properly screened HIV-negative wet nurse. However, an understanding of potential risks to this approach should be discussed in advance should the donor's HIV status change while donating breastmilk
	Mixed feeding includes a higher risk of transmission, therefore the introduction of complementary foods at around 6 months of age is recommended by Health Canada (19)
Safety of post-natal ART medications for the infant	Reaffirming the overall safety of post-natal ART medications used for infants but also the need for monitoring for potential side effects (eg, anemia, neutropenia)
Counselling when formula feeding is planned	Use of lactation suppressant (cabergoline (21,22)) (see Resources section for more detail) Dealing with breast engorgement and breast care (see Resources section for more detail)
	How to access formula, how to prepare formula, how to bottle feed, how to clean bottles, how to sterilize, resources for support with bottle feeding
	How to decide what type of bottle to use and what indications for trying a different type of bottle
	How to talk to family and friends about feeding, how to avoid involuntary disclosure (explanations as to why formula feeding)
	Approaches to encourage parent-infant bonding (eg, skin-to-skin contact)
Counselling when breastfeeding is planned	How to breastfeed effectively; achieving a good latch, maintaining a good supply, ensuring the infant is sucking and swallowing effectively, monitoring infant growth and hydration
	Signs of breastmilk or breast-feeding jaundice
	Avoiding engorgement, clogged milk ducts, and mastitis
	Maintaining nipple health
	Requirements of monitoring of mother and infant for HIV, medication compliance, antiretroviral toxicity, and frequency of follow-up visits. Close follow-up of mother by their HIV specialists with frequent viral load testing (eg, in most circumstances every 1–2 months). Follow-up of the infant with monthly HIV molecular testing is recommended in most circumstances

ART = Antiretroviral therapy

determines there is a significant risk of HIV transmission due to inconsistent compliance with clinical recommendations, referral to child protection services may be considered but only as a last resort where the child's health and safety is a real and imminent concern.
- Providers should be prepared to provide access to legal information and/or legal advice resources, for legal questions.
- For families that decide to breastfeed, a signed agreement may be considered as a mutually agreed upon source of documentation of the decision-making process. A sample agreement is available in Appendices 2 and 3.

Recommendation 4: As a prerequisite to breastfeeding, health care providers should counsel and support women on how to optimize their health and minimize the risk of HIV transmission through breastmilk.

- The mother should be fully adherent to ART and have sustained virologic suppression as measured by the viral load in the blood (ideally from before conception).
- The mother should have had regular attendance to standard follow-up visits for her pre-natal care.
- The mother, and where appropriate, their chosen support persons, are fully aware of the potential risk of HIV transmission with breastfeeding. Clear unbiased documentation should be made of the discussion of the potential risks by the provider with the mother and her support persons. Documentation should be shared with the mother and her support persons for clarity of discussion.
- If a health care provider is unwilling to support a mother's choice to breastfeed, they should refer her to a provider that can continue to provide safe care.

Recommendation 5: For women who meet the criteria to breastfeed in recommendation 4 and elect to breastfeed, frequent maternal monitoring (including viral load testing) (e.g., in most circumstances every 1–2 months) and follow-up is recommended until cessation of breastfeeding to ensure ongoing support and to address any challenges.

- Barriers to care and monitoring should be minimized, recognizing the challenges and extra support that may be needed to ensure ART adherence during the postpartum period.
- Extra supports should include reducing barriers to care, mental health, breastcare, and referral to allied health including social work, peer support, and lactation consultants as necessary.
- In exceptional circumstances (eg, international travel or rurality) monthly maternal monitoring may not be feasible and alternate testing intervals or compliance monitoring measures may be required

Clinical care recommendations for women while breastfeeding

- Maintaining adherence and virologic suppression:
  - Close monitoring that the mother is adherent to therapy and is not facing any difficulties in maintaining full adherence, including issues related to medication toxicity, ART cost, and social support.
  - To the extent possible, the maternal ART regimen during breastfeeding should not be altered in order to avoid the risk of a detectable viral load and/or any unanticipated side effects that may impact adherence or absorption.
  - In general, monthly or bimonthly viral load measurement until cessation of breastfeeding is recommended; however, depending on clinical circumstances more or less frequent monitoring may be appropriate. Consider providing access to maternal viral load monitoring in the paediatric clinic setting to reduce burden on the mother attending multiple appointments, and to allow the paediatric care team rapid access to results
  - If a maternal viral load becomes detectable, urgent consultation with adult and paediatric HIV care providers is necessary.
    - Initiation of triple antiretroviral prophylaxis to the infant may be considered if not already commenced depending on the perceived level of risk (eg, low-level increase in viral load suspected to be a viral blip versus significant increase in viral load suggestive of non-adherence or treatment failure). If triple ART prophylaxis is initiated, this should be re-assessed after the maternal viral load becomes undetectable (not detected is the definition used at the time of drafting these recommendations, though some labs/instruments now report down to <20 copies/mL).
    - Infant feeding options may include cessation of breastfeeding, temporary interruption of breastfeeding with maternal pumping, and discarding of breastmilk until re-testing can be done, or ongoing breastfeeding with close monitoring.
    - If there is persistent viral load elevation, an open discussion about cessation of breastfeeding is warranted given the significantly increased risk of vertical transmission.
  - Breastmilk viral load testing is not recommended due to lack of availability of testing, challenges in

interpreting results and delays in availability of results reducing ability to affect management.

- Maintaining optimal breast health:
  - Ensure adequate support for a good feeding latch to minimize the risk of cracked nipples, engorgement, or mastitis.
  - Engagement with lactation consultants in the prenatal period is a useful resource when possible. Opportunities to support access to free lactation support should be prioritized. Lactation support should be provided in a confidential way (eg, not in breastfeeding support group setting). Consideration should be given to referral to a lactation consultant who is aware of the complexities of HIV care and breastfeeding in the HIV context in Canada.
  - If mastitis occurs, it should be promptly treated, and the milk from the affected breast should be pumped and discarded, until mastitis resolves. Additional cleaning of the pump equipment after pumping from the affected breast should be performed. Pumping and feeding from another breast should be done prior to use of the pump on the affected breast.
    - On a case-by-case basis, consideration should be given to:
      - Cease breastfeeding
      - Temporarily interrupt breastfeeding with maternal pumping and discarding of breastmilk until resolution of mastitis
      - Continue breastfeeding with close monitoring
    - For significant or persisting breast inflammation consider initiating triple antiretroviral prophylaxis (Table 2) to the infant exposed to breastmilk during maternal mastitis whether or not breastfeeding continues. The choice of antiretroviral agents should take into consideration is known archived maternal HIV resistance. Continuation of triple antiretroviral prophylaxis can be re-assessed 4 weeks after the episode.
    - If not previously done, referral to a lactation consultant should be prioritized. Considerations for referral to lactation consultants are noted above.

Table 2: Recommendations on antiretroviral prophylaxis for breastfed infants

Preferred recommendations*
- Combination antiretroviral therapy with zidovudine, lamivudine, and nevirapine† for the first 4 to 6 weeks, followed by monotherapy with nevirapine until 4 weeks after cessation of breastfeeding
  - For infants whose mothers have known or suspected NNRTI resistance, prophylaxis with zidovudine, lamivudine, and raltegravir is appropriate as triple-drug therapy, followed by monotherapy with zidovudine
  - *Alternative for prolonged courses or if bone marrow toxicity arises consider exchanging zidovudine with abacavir after confirming negative HLA B5701 status*

Alternative recommendation options*
- Monotherapy with nevirapine† until 4 weeks after cessation of breastfeeding*
- Combination therapy with zidovudine, lamivudine, and nevirapine† until 4 weeks after cessation of breastfeeding
  - *Alternative for prolonged courses or if bone marrow toxicity arises consider exchanging zidovudine with abacavir after confirming negative HLA B5701 status*

For more detailed dosing of infants (including premature infants) see PMTCT dosing guidelines and Supplementary Material https://clinicalinfo.hiv.gov/en/guidelines/perinatal/antiretroviral-management-newborns-perinatal-hiv-exposure-or-hiv-infection?view=full

*Other guideline bodies or studies have used different recommendations or regimens for prophylaxis for the infant which are not currently recommended by the CPARG group in the Canadian context, including
- no antiretroviral prophylaxis for the duration of breastfeeding if mother is on ART
- nevirapine monotherapy for 6 weeks
- monotherapy with zidovudine, lamivudine, lopinavir/ritonavir, raltegravir

**Current evidence is not clear on merits of using monotherapy versus triple therapy in infant prophylaxis, especially if a woman meets all the criteria for risk reduction of transmission from breastfeeding. Risk of breastmilk transmission during the first month of life is higher, due to the high lymphocytic content of colostrum and early breastmilk. CPARG recommends triple antiretroviral therapy at least during this early period of higher risk*

†Nevirapine is a Special Access Programme medication in Canada and there could be delays obtaining stock unless the site where the baby is born has future use stock on hand

ART = Antiretroviral therapy; CPARG = Canadian Pediatric & Perinatal HIV/AIDS Research Group

- The total duration of breastfeeding should be minimized; weaning (ie, transitioning from breastfeeding to bottle feeding) before the introduction of solids at 4–6 months is recommended to minimize the period of mixed feeding.
- Weaning from breast to bottle feeding can be done by a willing mother and an accepting infant over a period of less than 2 weeks. Generally, gradual weaning from breast to bottle feeding up to 2–4 weeks is recommended; however, maternal preferences should be considered. To ensure a smooth transition to formula feeding, attempt transitioning over to expressed breastmilk by the bottle for a few days to weeks before switching to formula. While mixed feeding should be discouraged, if weaning does not occur by 6 months of age the addition of complementary foods as per standard nutrition guidance should be recommended, with counselling provided on the potential increased breastmilk transmission risk in the context of mixed feeding (other food exposures).

Recommendation 6: For infants being breastfed, a comprehensive management strategy is recommended.

- Antiretroviral prophylaxis is recommended for infants who are being breastfed, preferably until 1 month after complete cessation of breastfeeding (Table 2; see Appendices 4 and 5).
- Clinical and laboratory monitoring should be carried out to assess for possible antiretroviral medication toxicity (Table 3).
- Repeated molecular testing for HIV (HIV polymerase chain reaction [PCR] or viral load) of the infant to rule out perinatal and post-natal HIV infection (birth, 2 weeks, 4 weeks, then every 1–2 months until 2–4 months after last breastmilk exposure).
- Toxicity and monitoring:
  - HIV PCR testing of infant (birth, 2 weeks, 4 weeks, then every 1–2 months until 2–4 months after last breastmilk exposure).
  - Monitoring for medication-related toxicity should include periodic complete blood count, alanine transaminase (ALT), creatinine.
  - Given the unknown additional effects of prolonged antiretroviral prophylaxis through breastmilk, ongoing neurodevelopmental follow-up is recommended.
  - Infant's oral and gut health should be monitored and promptly treated if concerns arise (eg, oral thrush). If the child develops thrush or gastroenteritis, consideration should be given to stopping breastfeeding (Table 4).

Recommendation 7: Service providers should not report a person living with HIV to child protection services or police for breastfeeding.

When a woman living with HIV has decided to breastfeed her infant, a detailed assessment, as delineated above, of the mother's health, including her treatment adherence and degree of HIV virologic control (current and historic), and the reasons for her choice to breastfeed should be explored in detail. Working with the mother, and her support will achieve the outcome that is best for her and her infant.

If there is no significant risk of infant HIV infection as determined by the health care provider team, then there will be no referral to child protective services. However, if after detailed counselling of the woman, the health care provider team feels that the child is at significant risk of HIV infection due to demonstrated repeated lack of adherence to recommendations on the part of the mother, it may be necessary to engage with child protective services for additional support or child welfare needs. Lack of adherence may include failure to attend scheduled follow-up visits, compliance with treatment or diagnostic testing, sustained periods of detectable maternal viral load, nutritional concerns in the infant, or other child welfare concerns. The woman should be told that this is mandated by the HIV care provider's legal duty to report a situation where a child's health is being put at significant risk. Contacting child protection services should be seen as a

Table 3: Monitoring of infant for toxicity and transmission during breastfeeding

	Birth	2 weeks	4 weeks	Monthly until 2–4 months after last breastmilk
HIV PCR	X	X	X	X
CBC, ALT, creatinine	X	X	X	
Neurodevelopmental monitoring history and physical	X	X	X	X
History of feeding, gut health of infant	X	X	X	
History of breast health in mother, and ART compliance	X	X	X	X

ALT = Alanine transaminase; ART = Antiretroviral therapy; CBC = Complete blood count; PCR = Polymerase chain reaction

Table 4: Indications where cessation or temporary discontinuation of breastfeeding should be considered

Maternal	Infant (relative indications)
• Poor adherence to ART • Detectable plasma viral load • Psychological or psychosocial concerns on ability to adhere to follow-up • Cracked or bleeding nipples • Significant or recurrent mastitis or blocked ducts due to increased inflammatory response in breast tissue and potential for progression to mastitis	• Gut inflammation (eg, prolonged diarrheal, or vomiting illness) • Oral or esophageal candidiasis • Inability to adhere to ART • Concerns of antiretroviral toxicity

ART = Antiretroviral therapy

last resort in supporting women in their care during breastfeeding. It should be made clear at the outset of infant feeding counselling sessions at what point child protection services would be engaged with for support or for care needs if clinical recommendations/treatment is not being adhered to.

Recommendation 8: A robust surveillance system should be in place to monitor for cases of breastmilk transmission of HIV in order to further knowledge and detect gaps in care.

To date, the preponderance of research pertaining to breastmilk transmission of HIV has been performed in resource-limited settings and involved women on variable ART combinations and with variable degrees and duration of virologic control. For example, in the PROMISE cohort (12), two cases of breastmilk transmission occurred in women who had undetectable viral loads at the time, but who had only recently achieved virologic suppression in peripheral blood. There are very limited reliable published data on the risk of HIV transmission through breastmilk in mothers who have been on effective ART with sustained virologic suppression over a prolonged period of time.

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RESOURCES

Access to free formula programs: https://www.catie.ca/is-formula-good-for-my-baby/free-formula-programs.

British Columbia's Women's Hospital and Health Centre - http://www.bcwomens.ca/Professional-Resources-site/Documents/Oak%20Tree/HIV%20-%20Postpartum%20Orders%20for%20Woman%20who%20is%20Known%20HIV%20Positive%20PD%20Dec%2021%202016.pdf.

British HIV Association (BHIVA)

Canadian Pediatric & Perinatal HIV/AIDS Research Group. HYPERLINK "https://www.cparg.ca/" CPARG.ca – Home • Accueil.

Centre d'infectiologie mère-enfant (CIME) of the Centre hospitalier universitaire Sainte-Justine (CHUSJ) - http://www.cimechusj.ca/.

Counselling resources and checklist: https://cep.health/media/uploaded/CEP_HIVTool_Clinician_Nov24.pdf.

Dealing with breast engorgement and breast care

General information on infant feeding for women living with HIV – HYPERLINK "https://www.bhiva.org/file/5bfd308d5e189/BF-Leaflet-2.pdf" \l ":~:text=The%20British%20HIV%20Association%20recommends%20that%20the%20safest,to%20think%20about%20when%20feeding%20your%20new%20baby." https://www.bhiva.org/file/5bfd308d5e189/BF-Leaflet-2.pdf#:~:text=The British HIV Association recommends that the safest,to think about when feeding your new baby.

HIV and breastfeeding your baby with the "Safer Triangle" – https://www.bhiva.org/file/5bfd3080d2027/BF-Leaflet-1.pdf.

How to make formula: Written instructions: HYPERLINK "https://www.canada.ca/en/health-canada/services/milk-infant-formula/preparing-handling-powdered-infant-formula.html" Preparing and handling powdered infant formula – Canada.ca. Visual instructions: HYPERLINK "https://www.albertahealthservices.ca/assets/info/nutrition/if-nfs-safe-prep-inf-formula-powder.pdf" Safe Preparation of Infant Formula from Powder (albertahealthservices.ca).

Is Formula Good for My Baby? The Teresa Group and CATIE (Canadian AIDS Treatment Information Exchange). https://www.catie.ca/sites/default/files/2021-08/formula-en.pdf.

Ontario HIV Treatment Network: HIV Transmission Through Breastfeeding VIDEO (in English, French, and Spanish): HYPERLINK "https://www.ohtn.on.ca/hiv-transmission-through-breastfeeding/" HIV Transmission Through Breastfeeding | The Ontario HIV Treatment Network (ohtn.on.ca).

POSTPARTUM Orders for Woman who is KNOWN HIV POSITIVE, including use of lactation suppressant (Cabergoline)

Risks of HIV transmission through breastfeeding VIDEO (Dr. Lena Serghides). HYPERLINK "https://www.youtube.com/watch?v=n7sRKeUTmeE" Winner, IHDCYH Talks 2019: HIV transmission through breastfeeding – YouTube.