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Infant Feeding in People Living with HIV: Where Are We Now?

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Speaker Disclosures

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Disclosures: None

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Learning Objectives

1. Examine the evolution of infant feeding recommendations for people with HIV (PWH) in the US
2. Describe 2024 DHHS Perinatal Guidelines' infant feeding recommendations
3. Identify factors which increase or decrease the risk of breast milk-associated HIV transmission
4. Identify resources available for PWH who choose to breastfeed

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JIAS JOURNAL OF THE INTERNATIONAL AIDS SOCIETY Open Access

J Int AIDS Soc. 2019 Jan 18;22(1):e25224. doi: 10.1002/jia2.25224

"In the United States, we say, 'No breastfeeding,' but that is no longer realistic": provider perspectives towards infant feeding among women living with HIV in the United States

Emily L Tuthill [1,†,✉], Cecilia Tomori [2,3,†], Meredith Van Natta [4,†], Jenell S Coleman [5,†]

- National survey of OB, Adults ID, Pediatric Healthcare Providers
- **1/3 reported having PLHIV as patients who breastfed despite recommendations to formula feed**

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Did you know?

If a woman living with HIV has a sustained **UNDETECTABLE VIRAL LOAD**, the chance of transmitting HIV through breastfeeding **IS LESS THAN 1%**.

In the US and other high-resource countries, **GUIDELINES RECOMMEND PROVIDERS SUPPORT A PARENT'S DECISION TO BREASTFEED**.

Source: HHS Perinatal HIV Treatment Guidelines

BUILDING EQUITY, ETHICS, AND EDUCATION ON BREASTFEEDING AND HIV (BEEEBAH)

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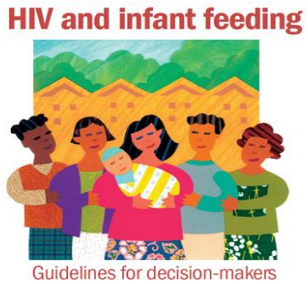
Landscape of Feeding in the Context of



World Health Organization

CLINICAL INFO HIV.gov

*Individuals **may face environmental, social, familial, and personal pressures to consider breastfeeding**, despite the risk of HIV transmission via breast milk*

***Individuals with HIV who are on ART with a sustained undetectable viral load and who choose to breastfeed should be supported in this decision. Individuals with HIV who choose to formula feed should be supported in this decision.** Providers should ask about potential barriers to formula feeding and explore ways to address them*

Infants should receive formula feeding

Replacement feeding when safe and feasible

Align with national guidelines; ***breastfeeding x 12 months or replacement feeding***

Mothers with HIV should ***breastfeed for at least 12 months and may continue breastfeeding for up to 24 months*** *or longer (similar to general population)* ***while being fully supported for ART adherence***

Breastfeeding not recommended**; Individuals who desire to breastfeed should receive patient-centered, evidence-based* ***counseling on infant feeding options

1998 2002 2010 2016 2017 2020 2023

WHO HIV and infant feeding, 2003, 2010 and 2016, https://apps.who.int/iris/handle/10665/42862; https://www.who.int/publications/i/item/9789241549707
https://clinicalinfo.hiv.gov/en/guidelines

FROM THE AMERICAN ACADEMY OF PEDIATRICS | CLINICAL REPORT | MAY 20 2024

Infant Feeding for Persons Living With and at Risk for HIV in the United States: Clinical Report FREE

Lisa Abuogi, MD, MS, FAAP ✉; Lawrence Noble, MD, FAAP; Christiana Smith, MD, MS, FAAP;
COMMITTEE ON PEDIATRIC AND ADOLESCENT HIV; SECTION ON BREASTFEEDING

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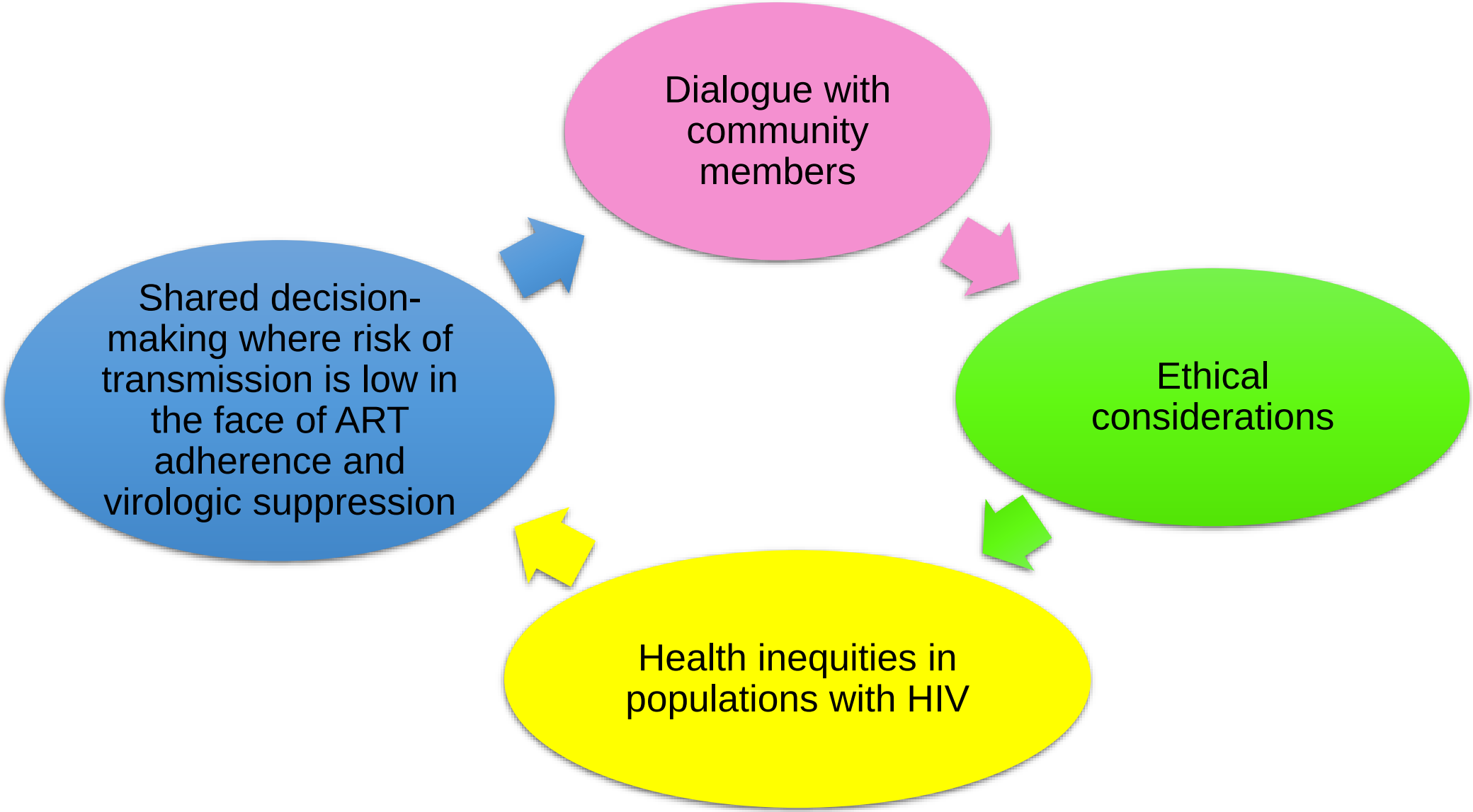
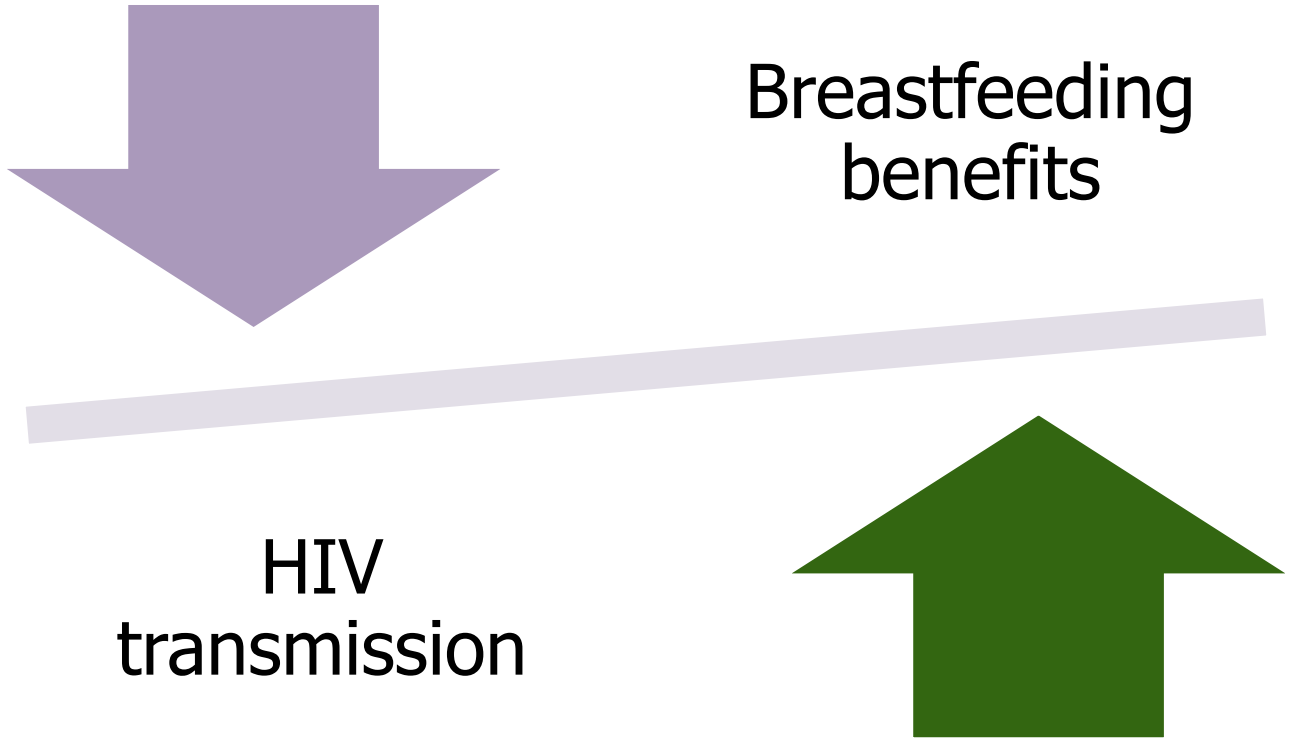
Pediatrics (2024) 153 (6): e2024066843.
https://doi.org/10.1542/peds.2024-066843 **Article history**

"Pediatricians should be prepared to offer a family-centered, nonjudgmental, harm reduction approach to support people with HIV on ART with sustained viral suppression below 50 copies per mL who desire to breastfeed."

Guidelines Evolve on Breastfeeding



Balancing Risk/Benefits



Motivations to Breastfeed

- Health benefits (for parent and baby)
- Bonding
- Cultural expectations
- Managing HIV status / disclosure concerns

Motivations to Formula Feed

- Avoid HIV transmission
- Convenience of formula feeding
- Share feeding duties
- Anxiety about potential transmission

Tariq et al. BMJ. 2016. DOI: 10.1136/sextrans-2015-052224
Greene et al. Health Care Women Int. 2015. DOI: 10.1080/07399332.2014.888720

Does U=U for breastfeeding mothers and infants? Breastfeeding by mothers on effective treatment for HIV infection in high-income settings

Catriona Waitt, Nicola Low, Philippe Van de Perre, Fiona Lyons, Mona Loutfy, Karoline Aebi-Popp

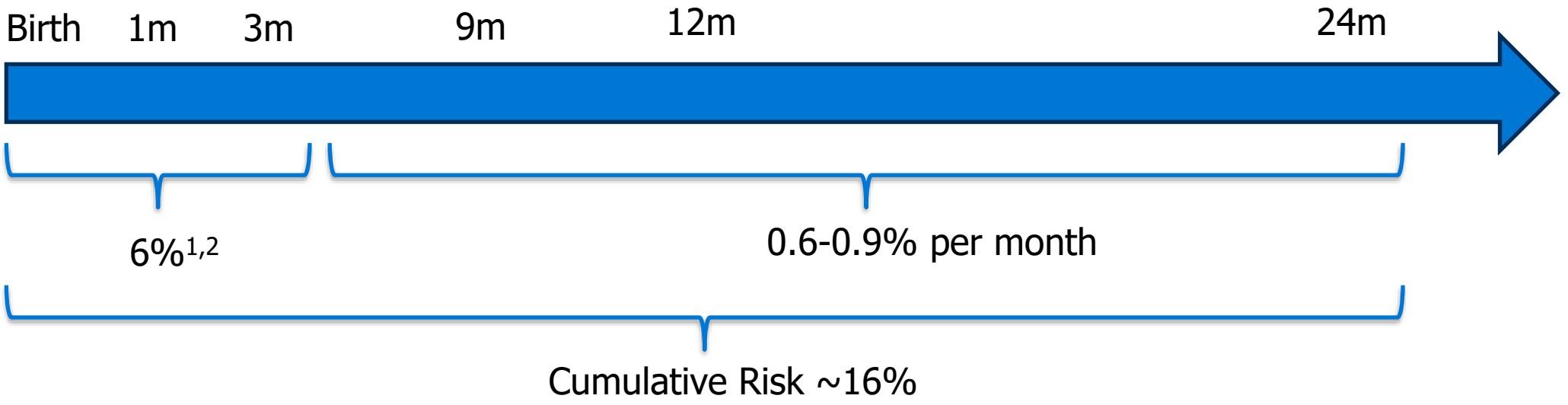
Sexual: No transmissions if partner with HIV is taking ART and has a viral load consistently <200 c/mL

Perinatal: No transmissions if pregnant person on ART before and during pregnancy and VL <50 c/mL during 3rd tri & at delivery

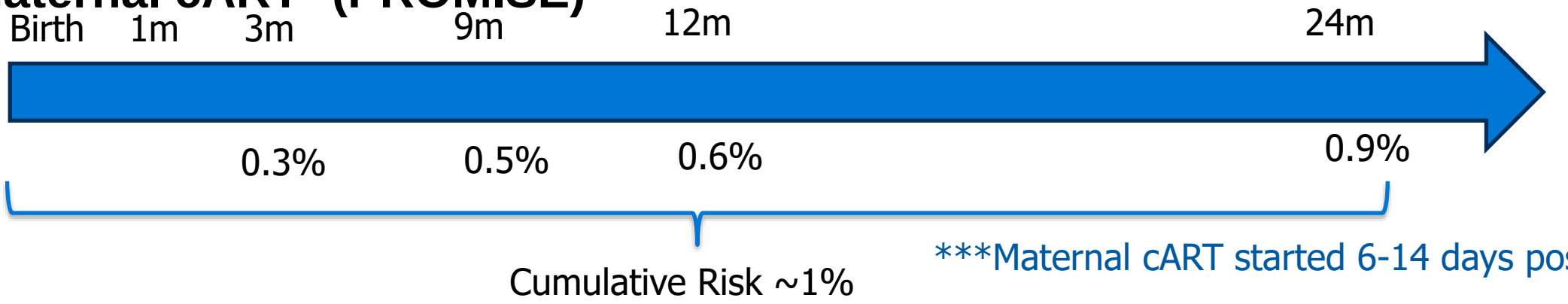
Wait Lancet 2018

Risk of HIV transmission during Breastfeeding

No maternal cART



Maternal cART[3] (PROMISE)



***Maternal cART started 6-14 days postpartum

[1]Nduati JAMA 2000; [2]Moodley JID 2003; [3]Flynn JAIDS 2018

Study	Population	ART Timing	Infant Transmission
Shapiro NEJM 2010	N=560 Botswana	Mat cART Pregnancy (3rd Trim)	2/709 infant tramissions due to BF a 6 months • 1 Mat Postpartum plasma VL <50, BM VL<50, Delivery VL 257 • 1 Mat Pp plasma, BM VL <50, reported ART adherence
Guiliano PLoS One 2013 DREAM	N= Ma		7 days) 0 40 • 4 mat plasma VL detectable
Luoga JAIDS 2018	N=216 Tanzania	Mat cART prior to or during pregnancy 23 mos (IQR 4-52)	2/186 (1%) infant transmissions • 1 mat plasma VL 511K • 1 mat d/c ART
Flynn JAIDS 2018 PROMISE	N=1220 Multi-center	Mat cART post-partum	7/1220 postnatal transmissions • 1 Mat pVL <40 sustained 14-36 weeks • 1 Mat pVL <40 at 14 weeks

Most transmissions occurred in following scenarios:

- Maternal VL>50 copies/mL
- Report of poor ART adherence

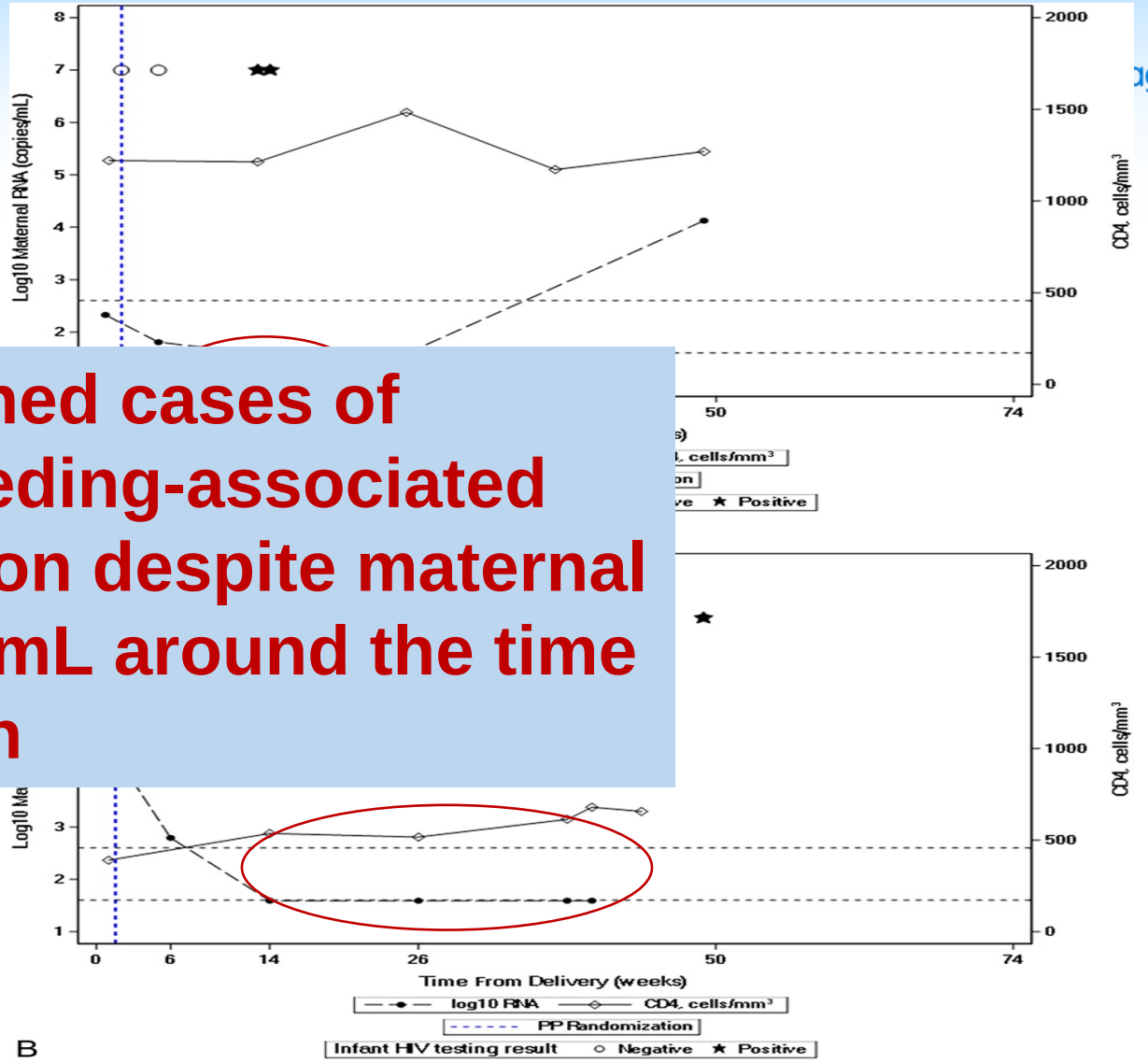
PROMISE
IMPAACT 1077
Promoting Maternal and Infant Survival Everywhere

1,220 mothers
ART

7 cases of
transmission

2 cases with maternal
HIV RNA < 40
1 at Week 14
1 at Week 36

Several published cases of breast/chestfeeding-associated HIV transmission despite maternal VL <50 copies/mL around the time of transmission



Flynn PM et al. JAIDS. 2021 Oct 1;88(2):206-213
Cohan et al. AIDS, 2015
Malaba et al. Lancet HIV. 2022
Guiliano et al. PLoSONE. 2013
Shapiro et al. NEJM. 2010

Forms of HIV Found in Breast Milk

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Cell-free HIV

- HIV that circulates and replicates in cell-free fraction of breast milk
- Measured as HIV RNA (viral load [VL])
- Maternal/Parental ART → suppresses breast milk VL
  - Each 10-fold increase in viral load doubles transmission risk

Cell-associated HIV

- HIV DNA in resting CD4 cells (latent reservoir)
  - Immune activation induces HIV expression from reservoir
  - **10x more efficient activation** of HIV from infected cells in **milk vs. plasma**
- **ART does not suppress cell-associated HIV in breast milk**
  - Inducible HIV expression in breast milk despite maternal ART
- May play important role in breast milk transmission

Montano M et al. JID 2003
Shapiro R et al. JID 2005

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No reported infant BF transmission with pre-conception maternal ART- NO RCT 

Study	Population	ART Timing	Infant Transmission
Nashid JPIDS 2020	N=3 Canada	Mat cART prior to pregnancy Infant cART duration BF (6-12 weeks)+3 weeks	No infant transmission Mat plasma, BM RNA VL <40 3/3 Mixed feeding 1/3
Crisinel EACS 2021	N=20 Switzerland	Mat cART prior to pregnancy No infant ppx	No infant transmissions
Yusef et al, JPIDS 2022	N=10 USA	Mat cART prior to pregnancy Infant cART 4-6 weeks, NVP 4 weeks after BF cessation	No infant transmissions
ISOSS	N=150 England	Not reported; HIV diagnosis prior to pregnancy (955)	No infant transmissions (106/150 follow up to date)
Levison et al CID 2023	N=72 US/Canada	86% on cART pre-conception	No infant transmissions (68/72 with follow-up to date)

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Recommendations for the Use of Antiretroviral Drugs During Pregnancy *and* Interventions to Reduce Perinatal HIV Transmission in the United States

Developed by the HHS Panel on Treatment of
HIV During Pregnancy and Prevention of Perinatal Transmission—
A Working Group of the Office of AIDS Research Advisory Council (OARAC)

Infant Feeding for Individuals With HIV in the United States

Updated: December 19, 2024
Reviewed: December 19, 2024

Panel's Recommendations

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When a parent living with HIV chooses to breast/chestfeed, *support is fundamental!*

"All I wanted to do was feed my baby. I was not seeking approval, I just needed support."

– Breastfeeding mother living with HIV

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People with HIV should receive evidence-based, patient-centered counseling to support shared decision-making about infant feeding. Counseling about infant feeding should begin prior to conception or as early as possible in pregnancy; information about and plans for infant feeding should be reviewed throughout pregnancy and again after delivery.

Replacement feeding with properly prepared formula or pasteurized donor human milk from a milk bank eliminates the risk of postnatal HIV transmission to the infant.

Achieving and maintaining viral suppression through antiretroviral therapy (ART) during pregnancy and postpartum decreases breastfeeding transmission risk to less than 1%, but not zero.

DHHS Recommendations for the Use of Antiretroviral Drugs During Pregnancy, Jan 2024. https://clinicalinfo.hiv.gov

Counseling PWH about Breastfeeding

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- Hardline prohibition of breastfeeding may inhibit people from expressing their wishes/plans
  - Lost opportunity to educate
  - PWH may breastfeed intermittently
    - Approximately **doubles the risk** of HIV transmission
- Non-judgmental open-ended questions re: feeding preferences
- Understand context of motivation:
  - Well-established health benefits
  - Cultural norm in resource limited settings
    - Fear of disclosure of own HIV status
    - Plans to return to home country in near future

- Validate desires, then educate re: risk vs. benefit to allow an informed decision
- Infant feeding plans should be made **during the antenatal period and coordination with OB and pediatric HIV specialists** should occur ideally prior to delivery

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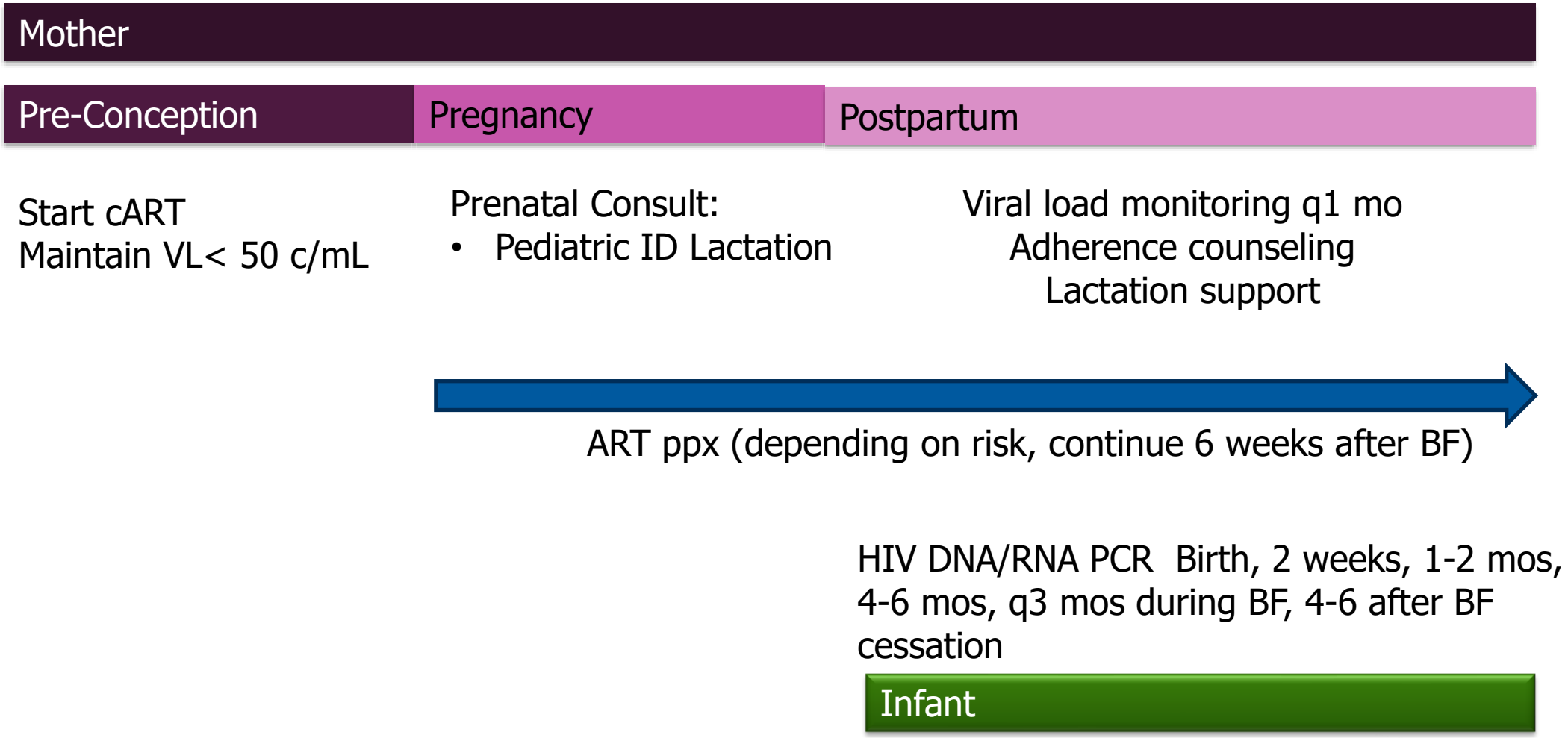
Johnson et al. CID 2016
Levison J et al. CID 2014

Continuum of Care for Mother and Infant



Viremia Associated with Breast Milk Transmission

- High plasma HIV RNA levels associated with higher transmission risk
- Even when ART renders plasma HIV viral load to undetectable, episodic detection of HIV RNA is not uncommon
- May result from:
  - Fluctuations in adherence
  - Declines in drug levels, e.g., due to drug interactions
  - Transient immune activation ⟶ expression of cell-associated HIV from reservoir

Shapiro RL et al. JID 2009
Jones LE et al. JAIDS 2007

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Issues to Address when Breastfeeding

- Mastitis
- Exclusive breastfeeding up to 6 months of age
- Consult Pediatric and OB ID

Subclinical Mastitis Associated with Elevated Breast Milk HIV Viral Loads

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- Mastitis increases mucosal permeability of mammary epithelium → elevated Na^+ concentrations in breast milk
- Subclinical mastitis, defined as Na^+ concentrations >12 mmol/L in the absence of symptoms, was **detected in 182/273 (67%)** women at some time during 6 weeks postpartum
- Subclinical mastitis had **significantly higher HIV RNA in breast milk at 1 week, 4 weeks and 6 weeks postpartum** (all $P < 0.05$).

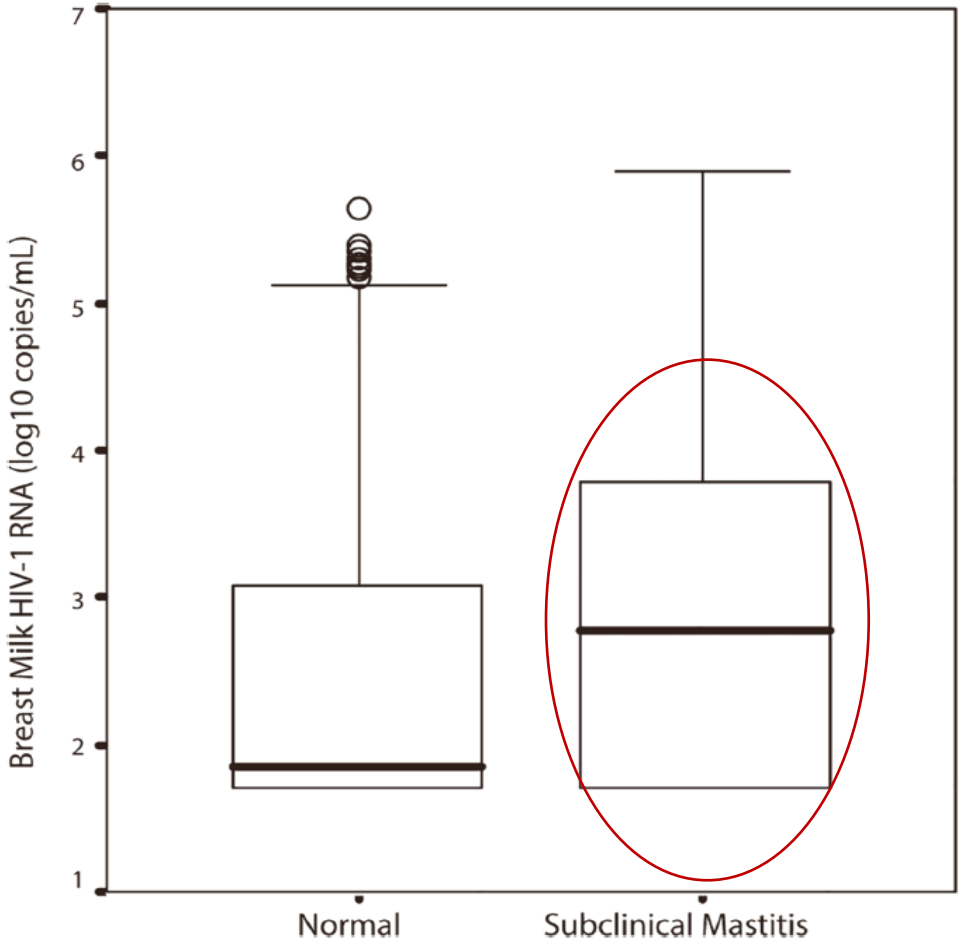

Fig 4. Breast Milk HIV-1 RNA in Samples from Breasts with and without Subclinical Mastitis. Subclinical mastitis is defined as sodium (Na^+) concentrations >12 mmol/L. All breast milk samples with HIV-1 RNA and Na^+ concentrations were used (744 samples with Na^+ concentration ≤ 12 mmol/L and 453 samples with Na^+ concentration >12 mmol/L). Box plots display medians, quartiles and outliers.

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Salado-Rasmussen K et al. PLoS One 2015

Issues to Address when Breastfeeding

- Mastitis
- Exclusive breastfeeding up to 6 months of age
- Consult Pediatric and OB ID

Exclusive Breast vs. Mixed Feeding

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Exclusive breast feeding

- No other fluids or food other than breast milk
- Originally evaluated to minimize exposure to breast milk in resource-limited settings

Mixed feeding

- Both breast milk and other fluids/food

- Infants on mixed feeding vs. exclusive breastfeeding have roughly **2 times greater risk** for HIV acquisition

Coovadia HM et al. Lancet 2007;369(9567):1107-1116.

Kuhn L et al. 2007. PLoS One

Issues to Address when Breastfeeding

Ann & Robert H. Lurie Children's Hospital of Chicago

Mastitis

Exclusive breastfeeding up to 6 months of age

Consult Pediatric and OB ID

- VL monitoring for mother
- Infant PCR testing
- Additional ARV prophylaxis
- Weaning
- Counseling about surveillance for mastitis, adherence support

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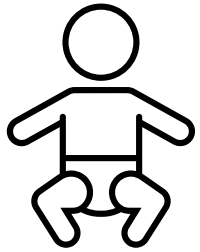
Maternal testing/ monitoring

Mother		
Pre-Conception	Pregnancy	Postpartum
Start cART Maintain VL< 50 c/mL	Prenatal Consult: • Pediatric ID Lactation	Viral load monitoring q1 mo Adherence counseling Lactation support

- If detectable VL, discontinue breastfeeding with the following options:
  - ➢ Give previously stored expressed milk from a date when person was virally suppressed while encouraging pumping and discarding breast milk to ensure that breastfeeding can resume;
  - ➢ Pump and flash heat breast milk before feeding it to the baby;
  - ➢ Provide replacement feeding with formula or pasteurized donor human milk;
  - ➢ Permanent cessation of breastfeeding (VL≥ 200 copies/mL)

Infant testing/ monitoring

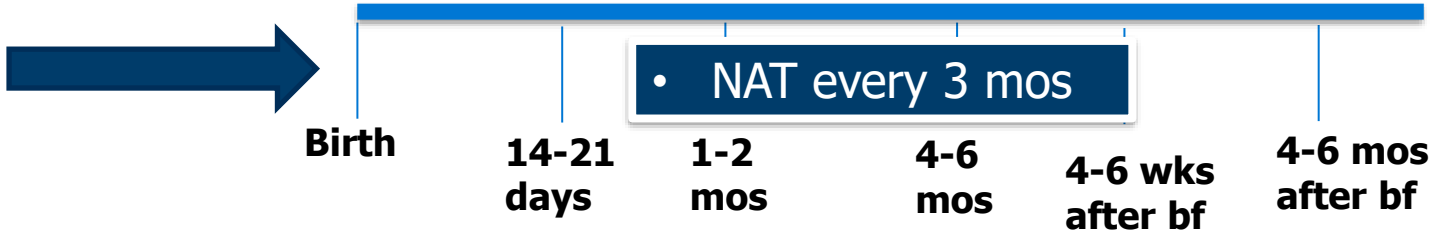
Virologic Testing During Breastfeeding



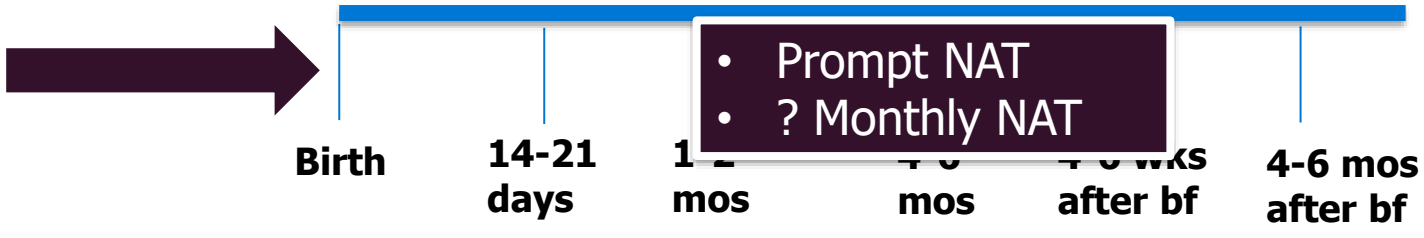
Age at Testing

From Birth – age 6 months

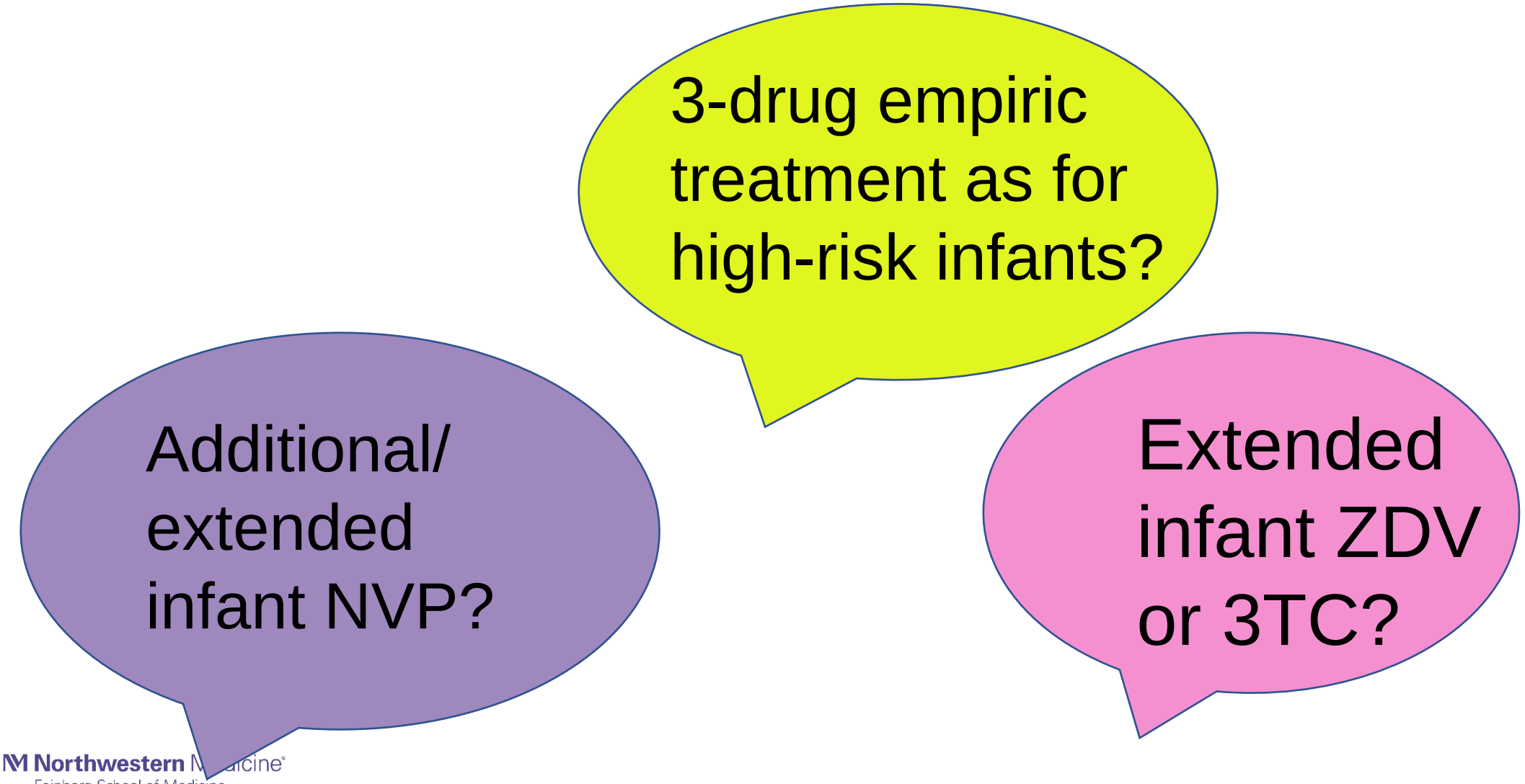
Breastfeeding beyond 6 mos



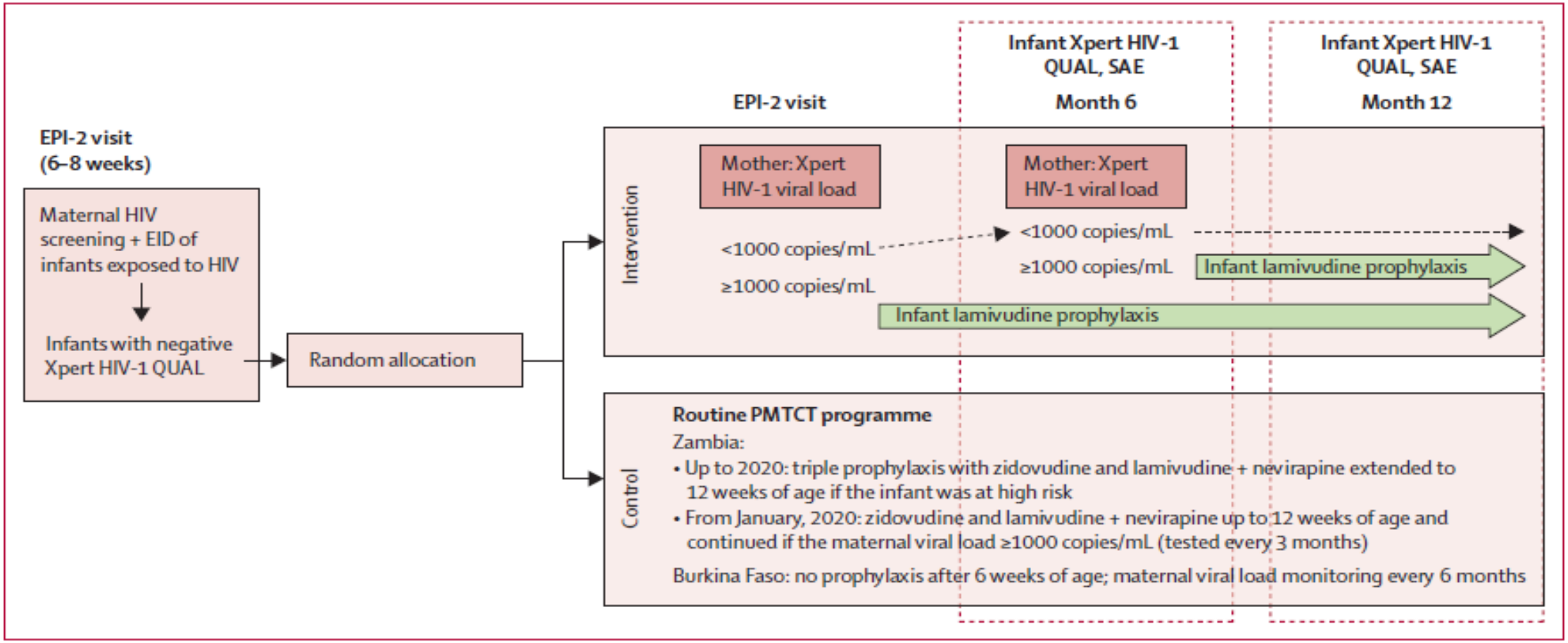
BF parent develops viremia



Breastfeeding: Infant Additional Prophylaxis



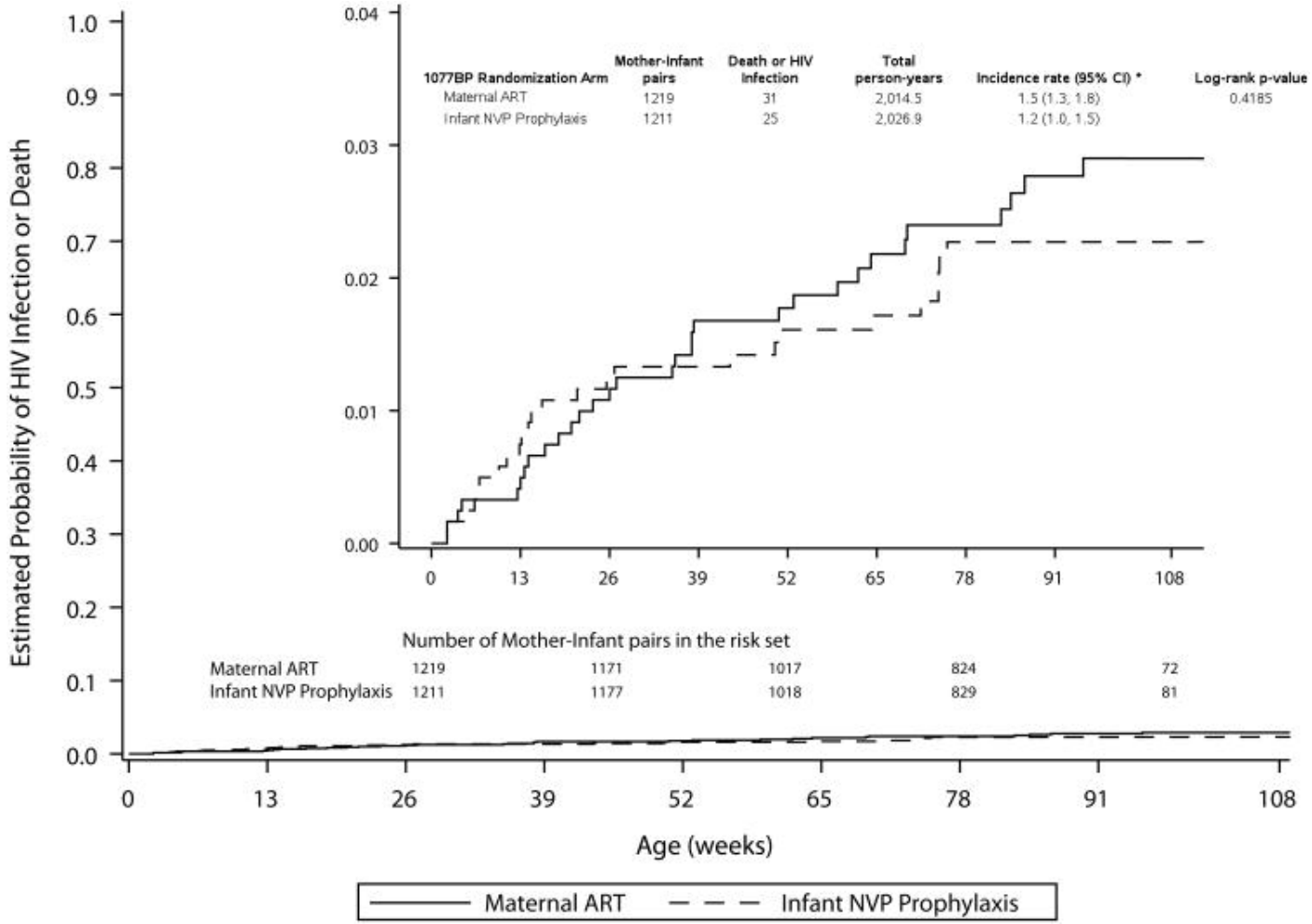
Options for extended prophylaxis: 3TC



Number of HIV transmission: 1 intervention; 6 in control arm

PROMISE-EPI, Kankasa et al, Lancet 2024

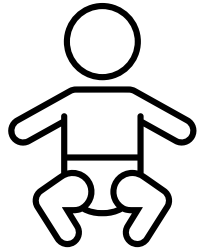
Options for extended prophylaxis: NVP



Number of HIV transmission: 7/1219 in the maternal ART ; 7/1211 in the infant NVP arm

PROMISE-, Flynn et al, JAIDS 2019

Level of Transmission Risk During Breastfeeding by HIV RNA Levels in Breastfeeding Parent



Infant ARV management

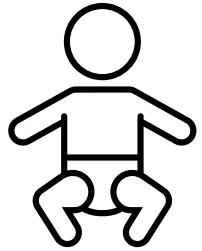
Sustained viral suppression (<50 copies/mL)

Current RNA levels <50 copies/mL, concerns about future risk

- 2 weeks of ZDV
- Extended prophylaxis with NVP or 3TC
  - Until 6 weeks after BF
- Discontinue prophylaxis sooner if concern for viremia is low

- Consider extended prophy with NVP or 3TC
- Consider BF cessation earlier if concerns about future risk of viremia

Level of Transmission Risk During Breastfeeding by HIV RNA Levels in Breastfeeding Parent



Infant ARV management

New viremia during BF (< 200 copies/mL)

- BF stopped temporarily
- Infant HIV NAT
- Some recommend initiation of single ARV prophylaxis/ presumptive ARV therapy
- Management based on repeat HIV RNA testing

New viremia during BF (≥200 copies/mL)

- Permanent discontinuation
- Initiate presumptive HIV therapy with 3 drugs regimen
- Duration 2-6 weeks
- If 3 drug regimen < 6 weeks, NAT is negative, continue ZDV alone for 6 weeks

Weaning

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- Plan ahead
- Rapid weaning associated with increased risk viral shedding in breast milk and transmission in pre-ART era
- Weaning over 2-4 weeks may be safer

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Kuhn L et al. N Engl J Med. 2008;359(2):130-141
Kuhn L et al. Sci Transl Med. 2013;5(181):181ra151.

Key Takeaways

- Counseling and discussion about infant feeding choices should occur ideally during the antenatal period, be approached in a non-judgmental manner, and present evidence-based recommendations.
- Breast milk - associated HIV transmission is low when the breastfeeding individual is virologically suppressed with excellent adherence but not zero.
- The only way to eliminate the risk of breast milk-associated HIV transmission is formula feeding.
- Coordinated Obstetric and Pediatric ID input are essential in supporting individuals who choose to breastfeed.

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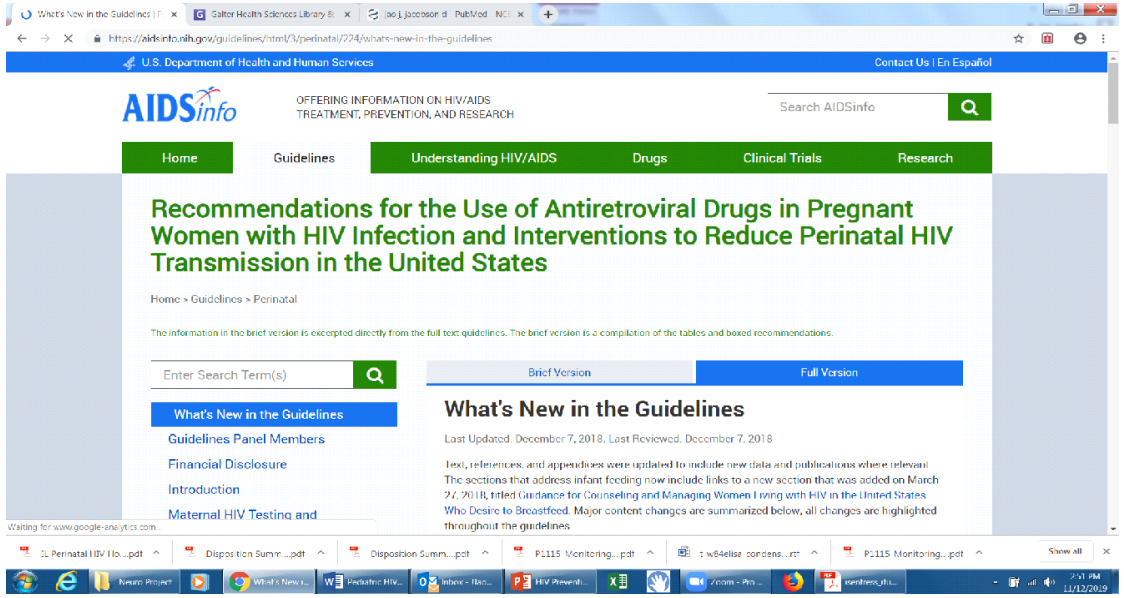
Additional References / Resources



https://clinicalinfo.hiv.gov/en/guidelines/perinatal/whats-new

- National Clinician Consultation Center
  http://nccc.ucsf.edu/
  - HIV Management
  - Perinatal HIV
  - HIV PrEP
  - HIV PEP line
  - HCV Management
  - Substance Use Management
- AETC National HIV Curriculum
  https://aidsetc.org/nhc

ACKNOWLEDGMENTS

DHHS - Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States 2024
https://clinicalinfo.hiv.gov/en/guidelines/perinatal/whats-new

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Danielle Campbell, MPH	Lisa Rahangdale, MD, MPH	Rodney L. Wright, MD, MSc
Rana Chakraborty, MD, MS, PhD	**Julia Rosebush, DO, FAAP**	Others
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