# What's New in Newborn Medicine?

### Leela Sarathy, MD MSEd

Pediatric and Newborn Hospitalist

Medical Director, Newborn Nursery

Mass General Brigham Mass General for Children



- 1. Neonatal hyperbilirubinemia: AAP 2022 Clinical practice guideline revision and review of some evidence
- 2. Congenital ankyloglossia and the 2024 AAP clinical report
- 3. HIV and Infant Feeding: 2023 NIH and 2024 AAP guidance



- Ex 39-week newborn, now 4 days old
- Exclusively breastfeeding, weight down 6% from birthweight (previously 7%)
- 4 wet diapers in past 24 hours, stools now yellow
- Serum bilirubin 19.0 mg/dL (direct 0.3)
- Phototherapy threshold 21.5



What would you do next?

- A. Readmit to birth hospital for phototherapy
- B. Start formula supplementation
- C. Recheck a serum bilirubin in 4-24 hours
- D. Provide reassurance
- E. B and C



# NEONATAL HYPERBILIRUBINEMIA

History

- 1950s: phototherapy
- 1960s: Rhogam
- 1994: first AAP guidelines

 Table 2.
 Management of Hyperbilirubinemia in the Healthy

 Term Newborn\*

| Age,<br>hours <sup>-</sup> | TSB Level, mg/dL (µmol/L)      |              |   |  |  |  |  |
|----------------------------|--------------------------------|--------------|---|--|--|--|--|
|                            | Consider<br>Photo-<br>therapy† | Phototherapy | Exchange<br>Transfusion<br>if Intensive<br>Phototherapy<br>Fails‡ | Exchange<br>Transfusion<br>and Intensive<br>Phototherapy |  |  |  |
| ≤24 <u>§</u>               |                                | •••          |   |  |  |  |  |
| 25-48                      | ≥12 (170)                      | ≥15 (260)    | ≥20 (340)   | ≥25 (430)  |  |  |  |
| 49-72                      | ≥15 (260)                      | ≥18 (310)    | ≥25 (430)   | ≥30 (510)  |  |  |  |
| >72                        | ≥17 (290)                      | ≥20 (340)    | ≥25 (430)   | ≥30 (510)  |  |  |  |

• 2004: nomograms, universal screening recommendation



CLINICAL PRACTICE GUIDELINE Guidance for the Clinician in Rendering Pediatric Care





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# Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation

Alex R. Kemper, MD, MPH, MS, FAAP,<sup>a</sup> Thomas B. Newman, MD, MPH, FAAP,<sup>b</sup> Jonathan L. Slaughter, MD, MPH, FAAP,<sup>c</sup> M. Jeffrey Maisels, MB BCh, DSc, FAAP,<sup>d</sup> Jon F. Watchko, MD, FAAP,<sup>e</sup> Stephen M. Downs, MD, MS,<sup>f</sup> Randall W. Grout, MD, MS, FAAP,<sup>g</sup> David G. Bundy, MD, MPH, FAAP,<sup>h</sup> Ann R. Stark, MD, FAAP,<sup>i</sup> Debra L. Bogen, MD, FAAP,<sup>j</sup> Alison Volpe Holmes, MD, MPH, FAAP,<sup>k</sup> Lori B. Feldman-Winter, MD, MPH, FAAP,<sup>l</sup> Vinod K. Bhutani, MD,<sup>m</sup> Steven R. Brown, MD, FAAP,<sup>n</sup> Gabriela M. Maradiaga Panayotti, MD, FAAP,<sup>o</sup> Kymika Okechukwu, MPA,<sup>p</sup> Peter D. Rappo, MD, FAAP,<sup>q</sup> Terri L. Russell, DNP, APN, NNP-BC<sup>r</sup>

# What is most relevant for outpatient providers?

- 1. New Phototherapy thresholds
- 2. Post-discharge follow-up recommendations
- 3. Rebound Bilirubin after phototherapy
- 4. Other considerations
  - Home phototherapy
  - Feeding
  - G6PD deficiency
  - Direct hyperbilirubinemia



1. Phototherapy Thresholds: rationale

"The primary goal of phototherapy is to decrease the likelihood of further increases in the TSB concentration that would lead to a need for escalation of care, including exchange transfusion"

New evidence:

- Bilirubin neurotoxicity does not occur until concentrations well above the 2004 exchange transfusion thresholds
- NNT to prevent exchange transfusion threshold varies widely
- Increased risk of epilepsy among children treated with phototherapy



- 1. Phototherapy Thresholds: Evidence
- Neurotoxicity does not occur until concentrations well above the 2004
   exchange transfusion thresholds



Ebbesen et al, Ac*ta Paediatrica* 2012; Wu, Y et al. *JAMA Pediatrics*, 2015; Kuzniewicz, M et al. *Pediatrics*, 2014; Wickremasinghe et al., *Pediatrics* 2015 slide adapted from T. Newman MD MPH

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# 1. Phototherapy thresholds: NNT

|                        | NNTs (95% CI)                   |                                     |                                      |                               |  |  |
|------------------------|---------------------------------|-------------------------------------|--------------------------------------|-------------------------------|--|--|
|                        |                                 |                                     |                                      |                               |  |  |
| Gestational<br>Age, wk | Age at Qualifying<br>TSB: <24 h | Age at Qualfying<br>TSB∶24 to <48 h | Age at Qualifying<br>TSB:48 to <72 h | Age at Qualfying<br>TSB:≥72 h |  |  |
| Boys                   |                                 |                                     |                                      |                               |  |  |
| 35                     | 14 (7–40)                       | 26 (14–57)                          | 83 (36–190)                          | 171 (70–426)                  |  |  |
| 36                     | 10 (6–19)                       | 19 (12–39)                          | 59 (31–101)                          | 122 (68–236)                  |  |  |
| 37                     | 16 (10–28)                      | 29 (20–58)                          | 95 (52–168)                          | 196 (100–407)                 |  |  |
| 38                     | 35 (14–100)                     | 67 (31–215)                         | 222 (107–502)                        | 460 (196–1352)                |  |  |
| 39                     | 74 (31–244)                     | 142 (62–554)                        | 476 (197–1385)                       | 989 (373–3607)                |  |  |
| 40                     | 106 (44–256)                    | 204 (98–487)                        | 682 (367–1294)                       | 1419 (634–3755)               |  |  |
| ≥41                    | 148 (54–428)                    | 284 (127–780)                       | 953 (366–3017)                       | 1983 (676–8408)               |  |  |
| Girls                  |                                 |                                     |                                      |                               |  |  |
| 35                     | 21 (12–49)                      | 40 (21–86)                          | 126 (50–267)                         | 261 (105–585)                 |  |  |
| 36                     | 15 (11–26)                      | 28 (20–51)                          | 90 (43–146)                          | 186 (102–347)                 |  |  |
| 37                     | 23 (16–39)                      | 44 (31–75)                          | 145 (73–243)                         | 300 (146–671)                 |  |  |
| 38                     | 53 (23–134)                     | 102 (43–236)                        | 339 (154–730)                        | 705 (314–2016)                |  |  |
| 39                     | 113 (58–342)                    | 217 (103–713)                       | 729 (272–1730)                       | 1516 (614–4520)               |  |  |
| 40                     | 162 (75–400)                    | 312 (164–704)                       | 1046 (491–2136)                      | 2176 (922–6107)               |  |  |
| ≥41                    | 226 (92–702)                    | 435 (183–1140)                      | 1461 (510–4842)                      | 3041 (888–11096)              |  |  |



# 1. Risks of Phototherapy

- Breastfeeding/bonding, parental wellbeing, healthcare utilization
- Small increased risk of epilepsy among children treated with phototherapy
- AHR 1.22-1.98 (1.4-2.78)
- Only seen/higher in boys



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Kemper et al *Am J Dis* Child 1990; Chambers et al, *Pediatr Emerg Care* 2011, Usatin et al *Pediatrics* 2010 Maimburg et al, *Epilepsy Research* 2006; Newman et al, *Pediatrics* 2018

# 1. New Phototherapy Thresholds



## Comparison to 2004 curves



Chou, J. "Bilirubin treatment thresholds/" *Incidental findings.* Aug 31, 2022. Accessed Oct 18, 2022. https://www.incidentalfindings.org/posts/2022-08-31\_bilirubin-thresholds/



# 2. Post-Discharge Follow-Up



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# 2. Post-discharge follow-up: Evidence

# Predicting the Need for Phototherapy After Discharge

Michael W. Kuzniewicz, MD, MPH,<sup>ab,c</sup> Jina Park, MD,<sup>c</sup> Hamid Niki, MS,<sup>a</sup> Eileen M. Walsh, RN, MPH,<sup>a</sup> Charles E. McCulloch, PhD,<sup>d</sup> Thomas B. Newman, MD, MPH<sup>ab,d</sup>

|  | From: 0/)     |                       | Predicted Probability of Exceeding Phototherapy Threshold |                |                 |  |
|--|---------------|-----------------------|---|----------------|-----------------|--|
|  | Frequency (%) |                       | Within 24 h, %  | Within 48 h, % | Ever (<30 d), % |  |
| Δ-TSB (mg/dL below<br>the AAP phototherapy<br>threshold) |               |                       |   |                |                 |  |
| 0 to -1  | 611(0.4)      | 120.44 (96.78–149.89) | 49  | 55             | 56              |  |
| <-1 to -2  | 2240 (1.5)    | 51.35 (43.94–60.01)   | 24  | 34             | 36              |  |
| <-2 to -3  | 5911 (4.0)    | 16.69 (14.44–19.29)   | 6   | 13             | 16              |  |
| <-3 to -4  | 14 078 (9.5)  | 4.58 (3.95–5.31)      | 0.4   | 3              | 5               |  |
| <-4 to -5  | 30 355 (20.5) | Reference             | n/a   | 0.4            | 1.1             |  |
| <−5 to −6  | 38 612 (26.1) | 0.14 (0.1–0.19)       | n/a   | 0.03           | 0.2             |  |
| <-6 to -7  | 26 102 (17.6) | 0.03 (0.01–0.06)      | n/a   | n/a            | 0.03            |  |
| <-7  | 30 253(20.4)  | 0.007 (0.002–0.029)   | n/a   | 0.008          | 0.008           |  |



# 2. Post-Discharge Follow-Up

- Follow-up based on how many mg/dL away from phototherapy threshold
  - For infants who have *not* received phototherapy

| Photot        | therapy threshold minus TcB or TSB  | Discharge Recommendations   |  |  |  |
|---------------|-------------------------------------|---|--|--|--|
| 0.1-1.9 mg/dL | Age <24 hours                       | Delay discharge, consider phototherapy, measure TSB in 4 to 8 hours   |  |  |  |
|               | Age≥24 hours                        | <ul> <li>Measure TSB in 4 to 24 hours<sup>a</sup></li> <li>Options:</li> <li>Delay discharge and consider phototherapy</li> <li>Discharge with home phototherapy if all considerations in the guideline are met</li> <li>Discharge without phototherapy but with close follow-up</li> </ul> |  |  |  |
| 2.0-3.4 mg/dL | Regardless of age or discharge time | TSB or TcB in 4 to 24 hours <sup>a</sup>  |  |  |  |
| 3.5-5.4 mg/dL | Regardless of age or discharge time | TSB or TcB in 1-2 days  |  |  |  |
| 5.5-6.9 mg/dL | Discharging <72 hours               | Follow-up within 2 days; TcB or TSB according to clinical judgment <sup>b</sup>   |  |  |  |
|               | Discharging ≥72 hours               | Clinical judgment <sup>b</sup>  |  |  |  |
| ≥7.0 mg/dL    | Discharging <72 hours               | Follow-up within 3 days; TcB or TSB according to clinical judgment <sup>b</sup>   |  |  |  |
|               | Discharging ≥72 hours               | Clinical judgment <sup>b</sup>  |  |  |  |



- Risk factors for rebound hyperbilirubinemia:
  - younger gestational age, hemolytic disease, younger age at phototherapy initiation, ending TSB closer to phototherapy threshold (Chang *Pediatrics* 2017)
- AAP recommendations:
  - IF phototherapy started <48hol OR DAT+/suspected hemolysis: obtain rebound 6-12 hours after phototherapy discontinuation
  - For all others, obtain rebound the next day
  - If photo only during readmission, obtain rebound in 1-2 days

\*TcB is acceptable if they have been off photo for at least 24h



## Bilirubin Measurement and Phototherapy Use After the AAP 2022 Newborn Hyperbilirubinemia Guideline

Leela Sarathy, MD,\* Joseph H. Chou, MD, PhD,\* Giuseppina Romano-Clarke, MD, Katherine A. Darci, MD, Paul H. Lerou, MD

- 8 hospitals, studied before and after guideline update, >22k newborns
- Phototherapy reduced by half, also saw decrease in serum bilirubin measurement.
- No significant increase in readmissions, outpatient bilirubin measurements, or incidence of IVIG/exchange transfusions



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Baby eligible for home phototherapy if all of the below:

- Gestational age  $\geq$  38 weeks
- No neurotoxicity risk factors
- $\geq$  48 hours old
- No previous phototherapy
- TSB no more than 1 mg/dL above the phototherapy threshold
- Clinically well

Chang et al. J Pediatrics, 2022



## breastfeeding jaundice $\rightarrow$ suboptimal intake jaundice

"Breastfed infants who are adequately hydrated should not routinely receive supplementation with commercially available infant formula"

- Hyperbilirubinemia risk is increased in infants feeding < 8x/day</li>
- Monitor for signs of adequate intake
  - urine output, transitional stools, normal weight loss (<75<sup>th</sup> percentile per NEWT tool), swallowing at the breast
  - consider supplementation if suboptimal may prevent readmission for phototherapy

Chen et al, Pediatr Int 2015, Wickremasinghe et al, JAMA Pediatrics 2018



# 4. Other Considerations: G6PD

- "one of the most important causes of hazardous hyperbilirubinemia leading to kernicterus in the United States and across the globe"
- Severe, atypical, or late-onset jaundice should raise suspicion
- If G6PD deficiency is strongly suspected but the measurement of G6PD activity is normal or close to normal, the G6PD activity should be measured at least 3 months later



https://step1.medbullets.com/hematology/107038/g6pd-deficiency



# 4. Other Considerations: direct hyperbilirubinemia

### Biliary atresia is the most common indication for liver transplant in children

### Presentation:

- Usually healthy at birth
- Elevated direct bilirubin levels shortly after birth
- Jaundice, dark urine, acholic stools within first few weeks of life; hepatosplenomegaly

Treatment: Kasai portoenterostomy

- restores bile flow from liver to proximal small bowel
- Kasai by 30 days of life can delay/prevent need for liver transplant

Screening can aid in prompt diagnosis

 repeat elevated dbili by 2 weeks of life had 100% NPV and led to earlier detection

(Harpavat JAMA 2020)





# 4. Direct hyperbilirubinemia: AAP recommendations



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- Elevated direct/conj. bilirubin: repeat within a few days to 2 weeks
- Persistent clinical jaundice (2 weeks for formula-fed, 3-4 weeks for breastfed): check total **and direct** (or conjugated) bilirubin levels
- What is abnormal:  $dbili \ge 1.0/cbili \ge 0.3$ 
  - *"an increase in the direct or conjugated bilirubin concentration suggests the possibility of pathologic cholestasis that requires further evaluation"*
  - Don't forget causes other than BA!



- Full term newborn, now 3 days old
- Weight loss stable, 3 wet diapers in past 24h
- Mom reports some initial pain/pressure with latch that quickly subsides, no nipple damage
- On exam, noted to have tight frenulum; LATCH score 9
- Parents inquiring about frenotomy. Have friends whose children have had breastfeeding issues later attributed to tongue tie. Also read on the internet about possible speech issues later in life.



What would you do next?

- A. Provide reassurance
- B. Refer to a lactation consultant and/or SLP
- C. Refer to ENT/dentist for lingual frenulectomy/frenotomy
- D. Start formula supplementation



# CONGENITAL ANKYLOGLOSSIA

## Tethered oral tissue (TOT)

Frenum Frenulum in mouth

Lingual frenulum

Cleveland Clinic ©2023



Mintz, Sheldon M. et al. An overview of oral frena and their association with multiple syndromic and nonsyndromic conditions. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics, Volume 99, Issue 3, 321 - 324



# Lingual frenulum anatomy

1. Presumed popular model of lingual frenulum stucture: A submucosal band



2. New evidence based understanding of lingual frenulum structure: A fascial layer with overlying mucosa - with explanation for morphological variability



Thomas J, Bunik M, Holmes A, Keels MA, Poindexter B, Meyer A, Gilliland A; SECTION ON BREASTFEEDING; SECTION ON ORAL HEALTH; COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY; COMMITTEE ON FETUS & NEWBORN; SECTION ON OTOLARYNGOLOGY-HEAD AND NECK SURGERY. Identification and Management of Ankyloglossia and Its Effect on Breastfeeding in Infants: Clinical Report. Pediatrics. 2024 Aug 1;154(2):e2024067605. doi: 10.1542/peds.2024-067605. PMID: 39069819.

# Congenital ankyloglossia

### 4.1. Frenulum thickness





### 4.2. Frenulum attachment to the tongue



https://www.rdhmag.com/career-profession/article/16405230/lingual-labial-frenums-early-detection-can-prevent-health-effects-associated-with-tongue-tie







Michael Woolridge, The 'anatomy' of infant sucking. Midwifery, 1986, 2, 164-71.

### The intraoral vacuum



## Breastfeeding and ankyloglossia



#### FIGURE 3

A, Ultrasound image of an infant with ankyloglossia prefrenulotomy. The base of the nipple is compressed. B, Postfrenulotomy, the base of the nipple is compressed to a lesser degree compared with prefrenulotomy.





#### FIGURE 5

A, Ultrasound image of an infant with ankyloglossia prefrenulotomy. The tip of the nipple is compressed. B, Postfrenulotomy the tip of the nipple is compressed to a lesser degree compared with prefrenulotomy.

Geddes, Donna & Langton, Diana & Gollow, Ian & Jacobs, Lorili & Hartmann, Peter & Simmer, Karen. (2008). Frenulotomy for Breastfeeding Infants With Ankyloglossia: Effect on Milk

| JAMA Network   |                        |                |               |  |  |  |  |
|--|------------------------|----------------|---------------|--|--|--|--|
| → JAMA Otolaryngology-<br>Head & Neck Surgery                              |                        |                |               |  |  |  |  |
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### **Original Investigation**

FREE

July 11, 2019

### Association of Feeding Evaluation With Frenotomy Rates in Infants With Breastfeeding Difficulties

Christen Caloway, MD<sup>1</sup>; Cheryl J. Hersh, MS, CCC-SLP<sup>2</sup>; Rebecca Baars, MS, CCC-SLP<sup>2</sup>; Sarah Sally, MS, CCC-SLP<sup>2</sup>; Gillian Diercks, MD, MPH<sup>2</sup>; Christopher J. Hartnick, MD, MPH<sup>1</sup>

» Author Affiliations | Article Information

JAMA Otolaryngol Head Neck Surg. 2019;145(9):817-822. doi:10.1001/jamaoto.2019.1696

- 115 newborns referred for feeding difficulty and evaluation for initial frenotomy
- First underwent SLP evaluation
- 43 (37.4%) felt to have functional impairments related to TOT, recommended for lip/tongue tie release
- 72 (62.6%) provided alternate strategies



## Epidemiology



Wei EX, Tunkel D, Boss E, Walsh J. Ankyloglossia: update on trends in diagnosis and management in the United States. 2012–2016. *Otolaryngol Head* Neck Surg. 2020;163(5):1029–1031; by way of AAP clinical report.

## Epidemiology



**OPERATING PROFITS** 

# Inside the Booming Business of Cutting Babies' Tongues

Dentists and lactation consultants around the country are pushing "tongue-tie releases" on new mothers struggling to breastfeed.





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# Identification and Management of Ankyloglossia and Its Effect on Breastfeeding in Infants: Clinical Report

Jennifer Thomas, MD, MPH, FAAP,<sup>a</sup> Maya Bunik, MD, MPH, FAAP,<sup>b</sup> Alison Holmes, MD, MPH, FAAP,<sup>c</sup> Martha Ann Keels, DDS, PhD,<sup>d</sup> Brenda Poindexter, MD, MS, FAAP,<sup>e</sup> Anna Meyer, MD, FAAP,<sup>f</sup> Alison Gilliland, MD, FAAP,<sup>g</sup> SECTION ON BREASTFEEDING, COUNCIL ON QUALITY IMPROVEMENT AND PATIENT SAFETY, SECTION ON ORAL HEALTH, COMMITTEE ON FETUS & NEWBORN, SECTION ON OTOLARYNGOLOGY-HEAD AND NECK SURGERY



## AAP recommendations

- Anatomic variation in the lingual frenulum has been observed
- 34%-96% of breastfeeding mothers experience nipple pain in the immediate postpartum period
- Fewer than 50% of infants with physical findings consistent with ankyloglossia had difficulty breastfeeding

### symptomatic ankyloglossia:

### the combination of a tight lingual frenulum and concomitant breastfeeding difficulties that do not improve with lactation support

Hogan M, Westcott C, Griffiths M. Randomized, controlled trial of division of tongue-tie in infants with feeding problems. *J Paediatr Child Health*. 2005;41(5–6):246–250 Srinivasan A, Dobrich C, Mitnick H, Feldman P. Ankyloglossia in breastfeeding infants: the effect of frenotomy on maternal nipple pain and latch. *Breastfeed Med*. 2006;1(4):216–224 Messner AH, Lalakea ML, Aby J, Macmahon J, Bair E. Ankyloglossia: incidence and associated feeding difficulties. *Arch Otolaryngol Head Neck Surg*. 2000;126(1):36–39 Dennis CL, Jackson K, Watson J. Interventions for treating painful nipples among breastfeeding women. *Cochrane Database Syst Rev*. 2014;2014(12):CD007366



## AAP recommendations

- Team-based approach
  - partnering of pediatricians and lactation specialists/nursing
  - if dentist consulted, collaborate with above team
- Consider ddx of ineffective feeding/poor growth
- Assess latch using standardized tool (LATCH, IBAT)



https://www.nurse.com/blog/bridging-roles-how-to-become-a-lactation-consultant/



For symptomatic ankyloglossia:

- Scissor clipping or laser (no comparative data)
- PT, craniosacral therapy, myofascial therapy not well studied
- Postfrenotomy stretching exercises are NOT recommended
- Osteopathic manipulation may be helpful for latching issues, but no evidence specifically for ankyloglossia



http://tonguetie.ballardscore.com/treatment.htm

### Ankyloglossia Algorithm



# Assessing lingual frenulum

### TABBY Tongue Assessment Tool

|  | 0 | 1 | 2 | SCORE |
|--|---|---|---|-------|
| What does the tongue-tip look like?        |   |   |   |       |
| Where it is fixed to the gum?              |   |   |   |       |
| How high can it lift<br>(wide open mouth)? |   |   | Î |       |
| How far can it stick out?                  |   |   |   |       |

C University of Bristol Design and Illustration: Hanna Oakes | oakshed.co.uk

Ingram J et al International Breastfeeding Journal 2019

### Posterior tongue tie



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Thomas J Pediatrics 2024
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"Posterior ankyloglossia is a poorly defined term, lacking agreement from experts, and should not be used as a reason to perform surgical intervention on an infant" Other ties

BREASTFEEDING MEDICINE Volume 16, Number 4, 2021 © Mary Ann Liebert, Inc. DOI: 10.1089/bfm.2021.29179.ylf ABM Position Statement

### Academy of Breastfeeding Medicine Position Statement on Ankyloglossia in Breastfeeding Dyads

Yvonne LeFort,<sup>1</sup> Amy Evans,<sup>2,3</sup> Verity Livingstone,<sup>4</sup> Pamela Douglas,<sup>5,6</sup> Nanette Dahlquist,<sup>7</sup> Brian Donnelly,<sup>8</sup> Kathy Leeper,<sup>9</sup> Earl Harley,<sup>10</sup> Susan Lappin<sup>11</sup>; and the Academy of Breastfeeding Medicine

 "The upper labial frenulum specifically is a normal structure with poor evidence for intervention improving breastfeeding and therefore cannot be recommended. Additionally, surgery to release a "buccal tie" should not be performed."







Clinical Consensus Statement 🔂 Free Access

### **Clinical Consensus Statement: Ankyloglossia in Children**

Anna H. Messner MD 減, Jonathan Walsh MD, Richard M. Rosenfeld MD, MPH, MBA, Seth R. Schwartz MD, MPH, Stacey L. Ishman MD, MPH, Cristina Baldassari MD ... See all authors  $\, \smallsetminus \,$ 

First published: 14 April 2020 | https://doi.org/10.1177/0194599820915457 | Citations: 14

### **Table 13.** Ankyloglossia and Oral Tie Action Statements for Clinicians.

| No. | Statement  | Mean | Outliers |
|-----|--|------|----------|
| 1   |  |      |          |
| 15  | Presence of an upper lip frenulum is normal in an infant.  | 8.45 | 0        |
| 17c | Upper lip tie has an unclear relationship to breastfeeding difficulties.   | 7.27 | 1        |
| 56c | Upper lip frenotomy in infants or children with primary dentition will not prevent the occurrence of an upper interincisor diastema. | 7.82 | 0        |
| 36  | Surgery to release a "buccal tie" should not be performed.   | 8.64 | 1        |



## Limitations/needs for future research

- Standardized approach for identifying and classifying ankyloglossia
- Long-term outcome measures
- Natural history of ankyloglossia/ long-term risk of feeding problems
- Lack of validated tool for diagnosing ankyloglossia







- Full term newborn born to G3P2→3 mother with HIV, on ART with undetectable viral load throughout pregnancy
- Was told she could not breastfeed first two children, feels guilty and sad about having missed out on this aspect of parenting
- Has been reading about promising studies for parents on ART who wish to breastfeed. Would like to try with this baby.



- A. Review the recommendation that breastfeeding is not recommended for patients with HIV
- B. Refer to child protective services
- C. Consult an infectious diseases specialist
- D. Review risks and benefits of breastfeeding with HIV and allow patient to come to an informed decision
- E. C and D



# **HIV AND HUMAN MILK**

# Background – pre-ART

- 30% HIV transmission occurs through breastfeeding
  - Primarily through persons not on ART/on ART but not virally suppressed
  - Highest in first 4-6 weeks of life
  - Highest if HIV acquired during lactation
  - also if high viral load, low CD4 count
- Other risks associated with transmission:
  - Breast problems (mastitis, cracked/bleeding nipples) infant thrush
  - Mixed feeding (human milk + formula and/or other foods)
  - Abrupt weaning

Abuogi L, Noble L, Smith C, COMMITTEE ON PEDIATRIC AND ADOLESCENT HIV; SECTION ON BREASTFEEDING. Infant Feeding for Persons Living With and at Risk for HIV in the United States: Clinical Report. *Pediatrics* (2024) 153 (6): e2024066843.



## Prior recommendations

- For countries with safe and affordable formula, safe drinking water, low mortality associated with respiratory/GI infections:
  - risk of HIV transmission through breastmilk > benefits of breastfeeding



# HIV and Breastfeeding



| Outcome and<br>Reference                                   | % Lower Risk | Breastfeeding <sup>a</sup> | Compared With:    | Comments <sup>b</sup>                     | OR, RR, or HR     | 95% CI                 |   |
|--|--------------|----------------------------|-------------------|---|-------------------|------------------------|---|
| SIDS <sup>87</sup>   | 40           | 2-4 mo                     | None              | Breastfeed at least<br>2 mo to reduce     | OR 0.60           | 0.44-0.82              |   |
|  |              |                            |                   | SIDS                                      |                   |                        |   |
|  | 60           | 4–6 mo                     | None              |   | OR 0.40           | 0.26-0.63              |   |
|  | 64           | >6 mo                      | None              |   | OR 0.36           | 0.22-0.61              |   |
| Infant mortality,<br>United States <sup>88</sup>           | 19           | Ever                       | Never             | US cohort                                 | OR 0.81           | 0.68–0.97              |   |
| Neonatal mortality<br>(8–27 d) <sup>88</sup>               | 51           | Ever                       | Never             | US cohort                                 | OR 0.49           | 0.34-0.72              |   |
| Postneonatal<br>mortality <sup>8</sup>                     | 21           | Ever                       | Never             | US nationally<br>representative<br>sample | OR 0.79           | 0.67-0.93              |   |
|  | 38           | >3 mo                      | Never             |   | OR 0.62           | 0.46-0.82              |   |
| Infant mortality<br>(7–365 d) <sup>9</sup>                 | 26           | Ever                       | Never             | US national cohort                        | OR 0.74           | 0.70-0.79              |   |
| Neonatal mortality<br>(7–27 d) <sup>9</sup>                | 40           | Ever                       | Never             | POLICY STAT                               | EMENT org         | ganizational Principl  | es to Guide and Define the Child Health                   |
| Postneonatal<br>mortality                                  | 19           | Ever                       | Never             |   | Car               | e system and/or m      |   |
| lnfant mortality,<br>developing<br>countries <sup>89</sup> | 33           | Exclusive                  | Predominant       |   |                   |                        | American Academy<br>of Pediatrics                         |
|  | 79           | Exclusive                  | Partial           |   |                   |                        | COLAID ®  |
|  | 93           | Exclusive                  | None              |   |                   |                        | DEDICATED TO THE HEALTH OF ALL CHILDREN                   |
| Infant mortality,<br>developing<br>countries <sup>90</sup> | 25           | Initiated in first<br>hour | >1st hour         |   |                   |                        |   |
| Lower respiratory<br>tract<br>infection <sup>91</sup>      | 19           | Exclusive 6 mo             | Exclusive <4 mo   |   | <b>O</b> ( ) ( )  |                        |   |
| Severe or<br>persistent                                    | 30           | Exclusive 6 mo             | Exclusive $<4$ mo | Policy                                    | State             | ement:                 | Breastfeeding and   |
| Otitis media <sup>92</sup>                                 | 33           | Even                       | Never             | tha IIa                                   | co of l           | Human                  | Millz   |
|  | 33           | More                       | less              |   |                   | lullall                |   |
|  | 43           | Exclusive 6 mo             | None              |   |                   |                        |   |
| Asthma 5–18 y <sup>93</sup>                                | 10           | More                       | Less              | Joan Younger Mee                          | k, MD, MS, RD, FA | AP, FABM, IBCLC,ª Lawr | ence Noble, MD, FAAP, FABM, IBCLC, <sup>b,c</sup> and the |
|  | 12           | Ever                       | Never             | Section on Breast                         | feeding           |                        |   |
| Asthma ever, all   | 22           | Longer                     | Shorter           | most protostiro ioi                       | -                 | 0.1 0.01               |   |
| ages <sup>94</sup>   |              |                            |                   | wheezing in first<br>2 y                  |                   |                        |   |
| Eczema first, 2 y <sup>93</sup>                            | 26           | Exclusive 3-4 mo           | Shorter           |   | OR 0.74           | 0.57-0.0.97            |   |
| Crohn's disease <sup>90</sup>                              | 29           | Ever                       | Never             |   | OR 0.71           | 0.59-0.85              |   |
| Illoonativo colitio <sup>95</sup>                          | 08           | 12 mo                      | 5—6 mo<br>Neven   |   | UK 0.20           | 0.08-0.50              |   |
| orderative contis  | 22           | 12 mo                      | 3–6 mo            |   | 0R 0.78           | 0.07-0.91              |   |
| Childhood<br>obesity <sup>96</sup>                         | 22           | Ever                       | Never             |   | OR 0.78           | 0.74-0.81              |   |
| ,  | 10           | <3 mo                      | Never             |   | OR 0.90           | 0.84-0.95              |   |
|  | 12           | 3—5 mo                     | Never             |   | OR 0.88           | 0.79-0.97              |   |
|  | 17           | 5–7 mo                     | Never             |   | OR 0.83           | 0.76-0.90              |   |
|  | 21           | >7 mo                      | Never             |   | OR 0.79           | 0.70-0.88              |   |
| Childhood and  | 23           | Ever                       | Never             |   | OR 0.77           | 0.69-0.86              | 👝 Mass General Brigham                                    |

OR 0.74

OR 0.69

0.68-0.80

0.61-0.79

TABLE 2 Breastfeeding and Infant Outcomes<sup>a</sup>

adult obesity97

26

31

Greater

Exclusive

Less

Nonexclusive

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## Post-ART era

- Risk very low (0.3% at 6mo, 0.6% at 12mo)
- But not 0%
  - transmission has been documented despite viral suppression
  - reports of low-level VL in milk of people with undetectable VL
- Growing number of reports of people with HIV desiring to breastfeed





### Infant Feeding for Individuals With HIV in the United States

Updated: January 31, 2023 Reviewed: January 31, 2023



#### **Panel's Recommendations**

- 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 (AIII). During counseling, people should be informed that—
  - 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 (AI).
  - Achieving and maintaining viral suppression through antiretroviral therapy (ART) during pregnancy and postpartum decreases breastfeeding transmission risk to less than 1%, but not zero (AI).
- Replacement feeding with formula or banked pasteurized donor human milk is recommended to eliminate the risk of HIV transmission through breastfeeding when people with HIV are not on ART and/or do not have a suppressed viral load during pregnancy (at a minimum throughout the third trimester), as well as at delivery (AI).
- Individuals with HIV who are on ART with a sustained undetectable viral load and who choose to breastfeed should be supported in this decision (AIII).
- 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 (AIII).
- Engaging Child Protective Services or similar agencies is not an appropriate response to the infant feeding choices of an individual with HIV (AIII).

Clinicians are encouraged to consult the national Perinatal HIV/AIDS definition (1-888-448-8765) with questions about infant feeding by individuals with HIV (AIII).

CLINICAL REPORT Guidance for the Clinician in Rendering Pediatric Care





DEDICATED TO THE HEALTH OF ALL CHILDREN™

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

Lisa Abuogi, MD, MS, FAAP,<sup>a</sup> Lawrence Noble, MD, FAAP,<sup>b</sup> Christiana Smith, MD, MS, FAAP,<sup>a</sup> COMMITTEE ON PEDIATRIC AND ADOLESCENT HIV, SECTION ON BREASTFEEDING

American Academy of Pediatrics



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- Breastfeeding should be supported for people with HIV who strongly desire to breastfeed after comprehensive counseling if all of the following criteria are met:
  - ART was initiated early in or before pregnancy;
  - There is evidence of sustained viral suppression in the parent (HIV viral load <50 copies per mL);</li>
  - The parent demonstrates a commitment to consistently taking their own ART and to giving infant ARV prophylaxis;
  - The parent has continuous ART access.

the AAP recommends that people with HIV be advised that **complete replacement of human milk** with infant formula or certified, banked donor human milk are the only infant feeding options that **completely eliminate the risk** of postnatal HIV transmission via human milk



## AAP recommendations





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- Discussion should begin prenatally
- Importance of exclusive breastfeeding through 6 months of life
- Gradual weaning over 2 to 4 weeks
- Enhanced monitoring
  - plasma HIV RNA or DNA polymerase chain reaction:
    - 14 to 21 days, 1 to 2 months, and 4 to 6 months of life
    - and then every 2 months throughout lactation
    - at 4 to 6 weeks and 3 and 6 months after weaning
  - Regular assessment of viral load in the breastfeeding parent
    - eg, every 1–2 months



### Patient education



**Newborn Family Unit** 

# Breastfeeding Guide for People with HIV

If you choose to breastfeed your baby, we are here to help you. This handout will provide you with information on breastfeeding your baby. If you have any questions, please ask your care team. Your care team includes your obstetrician (OB) and/or midwife, nurse, lactation consultant, and baby's pediatrician.

### **Starting Breastfeeding**

- Talk to your care team and family about your feeding plans.
- Make sure you feel comfortable with your feeding plan before you leave the hospital.
- Take your HIV medicine every day:
  - This is important to prevent HIV from getting into your breast milk.
  - Make a plan with your care team and family to help you remember.
- Take care of yourself:



### **Tips for Successful Breastfeeding**

## Key Messages

- The 2022 AAP neonatal hyperbilirubinemia guidelines offer new thresholds for phototherapy and clearer guidance for follow-up; these changes have been shown to reduce unnecessary testing/treatment without any adverse consequences.
- Anatomical variation of the lingual frenulum is normal, and the only indication for a frenulectomy/tongue tie release is symptomatic ankyloglossia, ie a tongue tie causing latching issues that cannot be attributed to other maternal or infant factors.
- For HIV+ patients on ART with an undetectable viral load, the decision to breastfeed should be discussed using shared decision making and those who choose to breastfeed should be supported and carefully monitored in the outpatient setting.



# **QUESTIONS/COMMENTS**

# Thank you!

### Isarathy@mgb.org

Mass General Brigham
Mass General for Children