# What Is Ankyloglossia ?

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- **We have nothing to disclose**
- **We will not discuss off – label medications**

# GOALS OF PRESENTATION

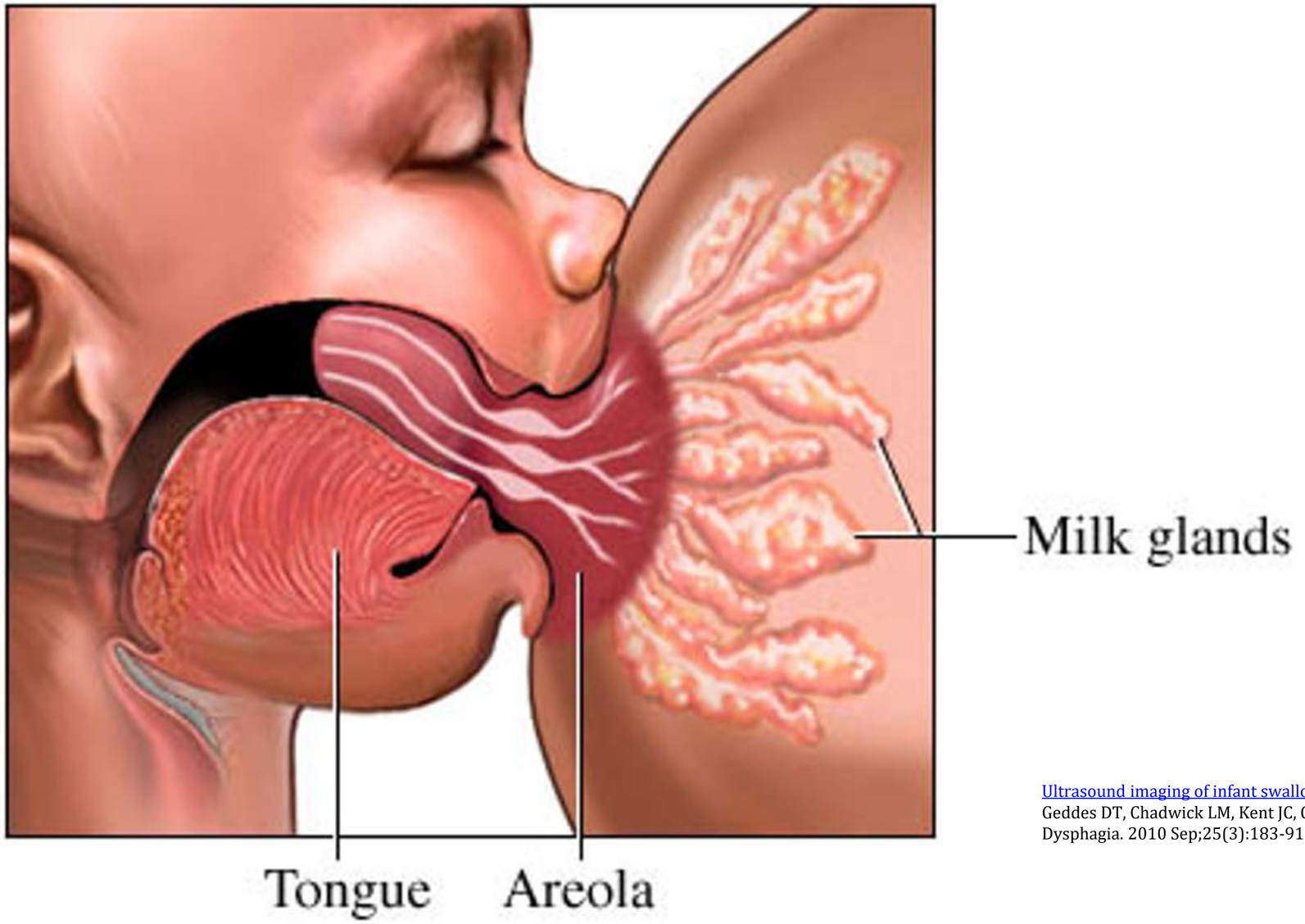
- What is tongue – tie and its relationship to breastfeeding ?
- What is “Upper Lip Tie” and its relationship to breastfeeding ?
- What is “Buccal Tie” and its relationship to breastfeeding ?

# Consider this…

**A sampling of patients recently seen in ENT clinic for evaluation of ankyloglossia :**

- 3 week old late preterm (36 weeks GA) referred for ”posterior tongue tie.” Mother is a dentist.
- 4 month old referred for “feeding difficulties”, history of slow weight gain and nursing difficulties that are improving over time. Family is Spanish speaking.
- 4 week old referred for “shallow latch”; second opinion following diagnosis of 6 tethered oral tissues (tongue tie, lip tie, buccal tie x 4) by pediatric dentist.
- 7 week old with GERD and torticollis, referred for “difficulty breastfeeding and poor weight gain.” Prior evaluations by lactation counselor x 2, chiropractor, physical therapist with differing diagnoses.

# Anatomy of Breastfeeding




Ultrasound imaging of infant swallowing during **breast-feeding**.
Geddes DT, Chadwick LM, Kent JC, Garbin CP, Hartmann PE.
Dysphagia. 2010 Sep;25(3):183-91.

# Mechanics of Breastfeeding

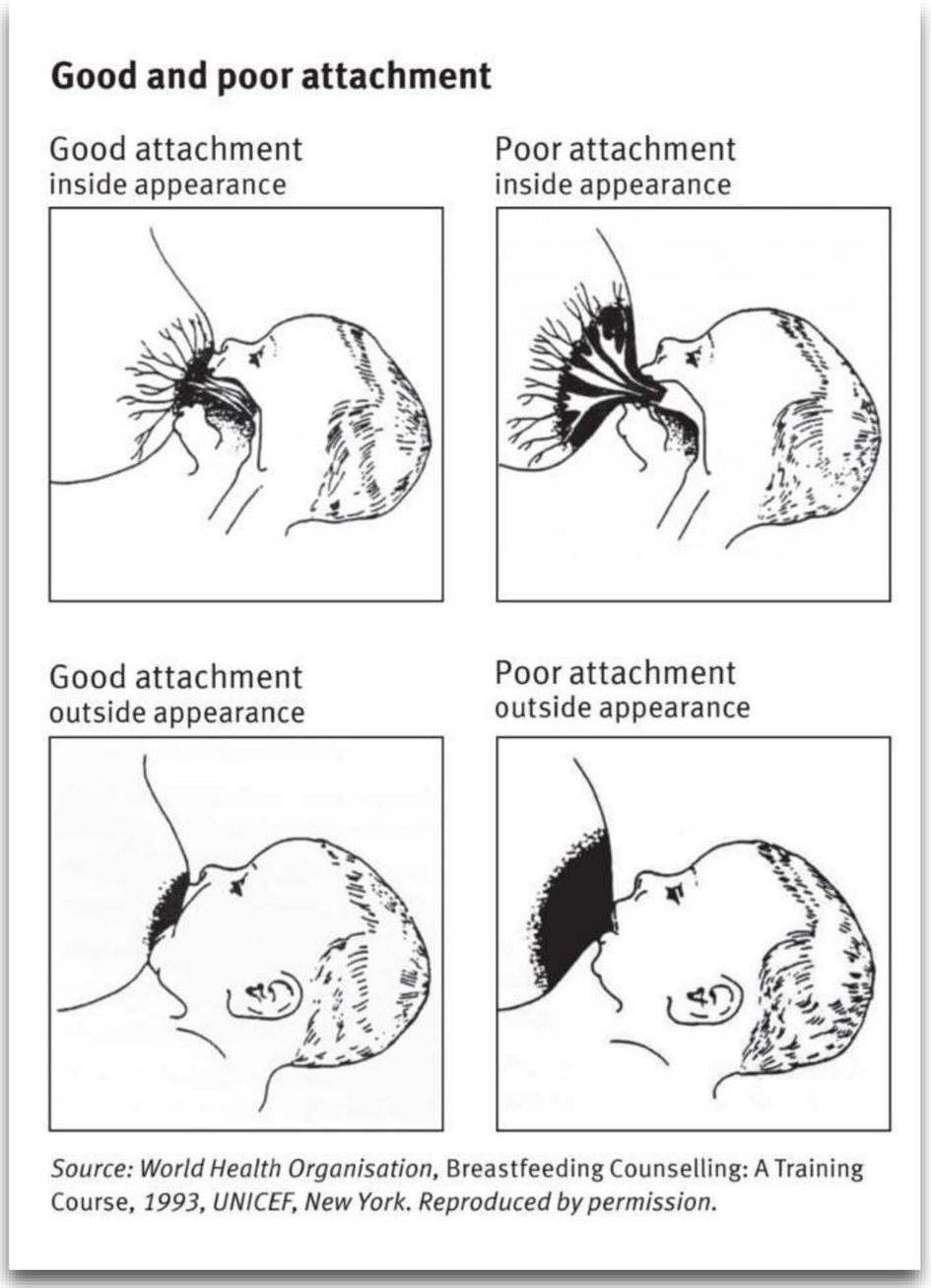
## Sequence to Successful Latch

- Head tilts back and mouth gapes wide
- Infant moves tongue **forward** to grasp and draw the nipple and areola into the mouth
- Front to mid-dorsal tongue **lifts** the nipple against the hard palate and forms an airtight seal with minimal compression
- Tongue base drops **down**, expanding the chamber and creates negative pressure in order to extract milk from the breast
- Latch will appear asymmetrical

Poor latch**? Troubleshoot**

- Positional? Try repositioning
- Restriction? Evaluate oral opening, tongue, palate.

Cadwell, K., & Turner-Maffei, C. (2017). *Pocket Guide for Lactation Management* (3rd ed., pp. 16-26). Jones & Bartlett Learning.

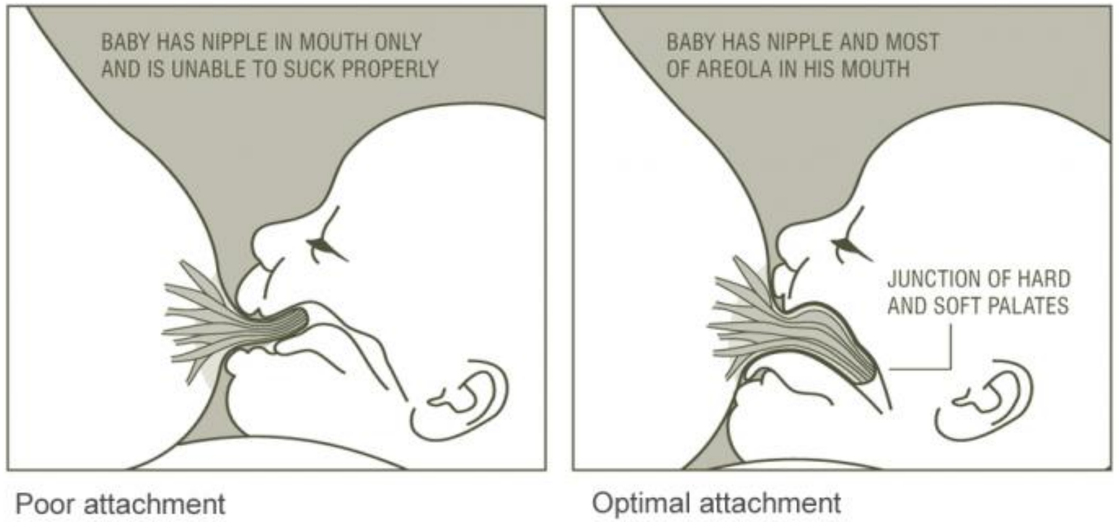


# Concern: Restricted Latch Feeding Pattern

**Baby has difficulty initiating and maintaining latch onto breast or bottle**

Signs and symptoms:

- **Shallow appearing latch**, not asymmetrical
- **Feeding** times are **very short** or **very long**
- **Ineffective milk transfer**, no 2:1 or 1:2 suck : swallow pattern
- Baby at risk for:
  - Inadequate weight gain
  - Jaundice
  - Gassiness and reflux from swallowing excess air
  - Frustration, biting at nipple
- Mother at risk for:
  - Breast engorgement
  - Decline in milk supply
  - Nipple injury, plugged milk ducts and mastitis




https://www.thewomens.org.au/health-information/breastfeeding/breastfeeding-overview/how-to-breastfeed

**Cadwell, K., & Turner-Maffei, C. (2017). Pocket Guide for Lactation Management (3rd ed., pp. 52-75). Jones & Bartlett Learning.**

# Many Factors to Consider…

**There are various maternal and infant elements that can contribute to neonatal feeding difficulties :**

- Infant factors may include :
  - Oromotor tone
  - Anatomical differences in palate, jaw (cleft palate, micrognathia and retrognathia)
  - Cardiovascular and respiratory factors
  - Infection, jaundice, hypoglycemia, birth injury, milk protein intolerance, etc. A comprehensive pediatric evaluation is essential
- Maternal factors may include :
  - Insufficient milk supply
  - Anatomical differences (h/o breast surgery)
  - Maternal desire to breastfeed, family support, stress

**Cadwell, K., & Turner-Maffei, C. (2017). *Pocket Guide for Lactation Management* (3rd ed., pp. 112-159). Jones & Bartlett Learning.**

# Could it be a tongue tie?

## Considerations :

- **Diagnosis** must include the physical **appearance** of the lingual frenulum **AND** a **functional** assessment of tongue mobility
- The incidence of tongue tie in the general population is estimated between 0.02% - 12%
- Epidemiological studies have reported an increase in the diagnosis of tongue tie and tongue tie release procedures

- Why the variability?
  - A diverse group of providers may encounter a baby with feeding difficulties
  - No current consensus exists regarding appropriate diagnostic tools


Walsh, Jonathan, and Margo McKenna Benoit. “Ankyloglossia and Other Oral Ties.” *Otolaryngologic Clinics of North America*, vol. 52, no. 5, Oct. 2019, pp. 795–811.

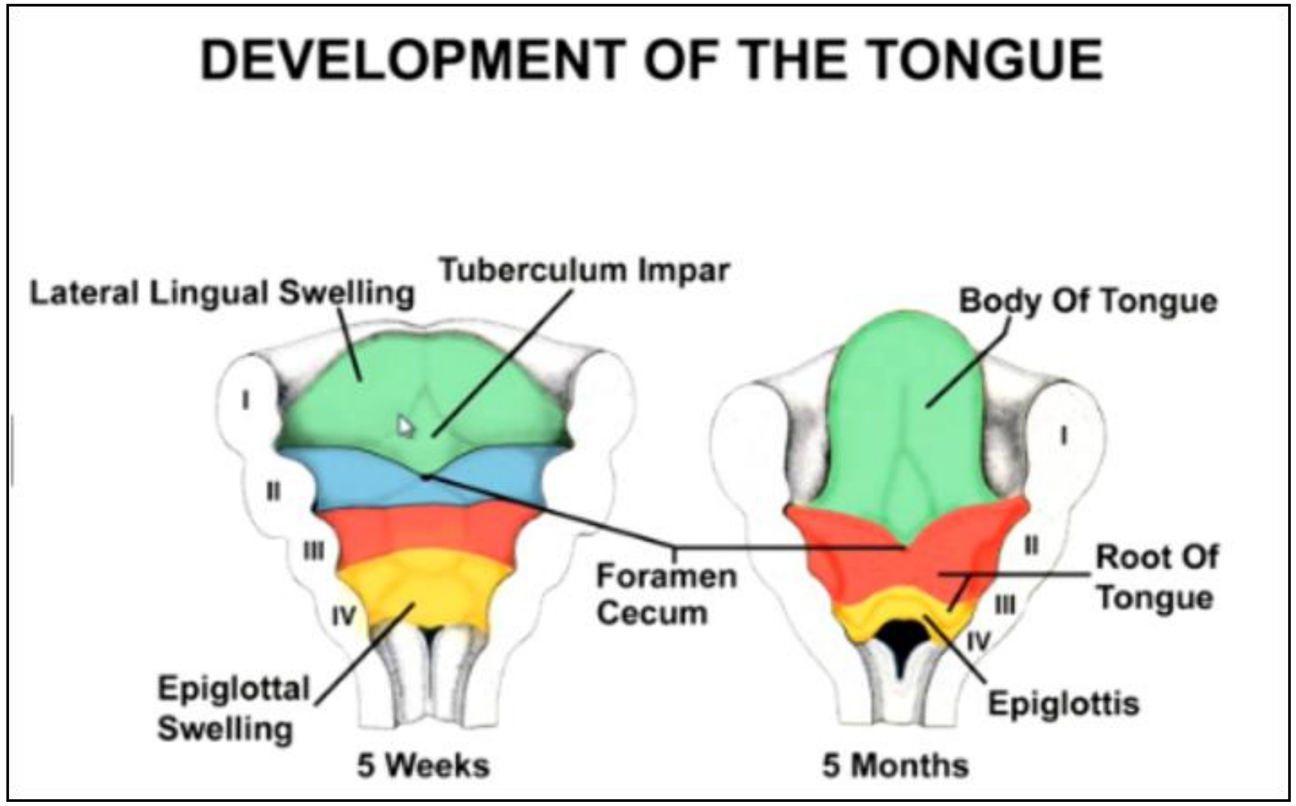
# Hazelbaker Assessment Tool

| Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLLF) | | | |
|---|---|---|---|
| Appearance items | Score | Function items | Score |
| Appearance of tongue when lifted | | Lateralization | |
| Round or square | 2 | Complete | 2 |
| Slight cleft in tip apparent | 1 | Body of tongue but not tongue tip | 1 |
| Heart-shaped | 0 | None | 0 |
| Elasticity of frenulum | | Lift of tongue | |
| Very elastic (excellent) | 2 | Tip to mid-mouth | 2 |
| Moderately elastic | 1 | Only edges to mid-mouth | 1 |
| Little or no elasticity | 0 | Tip stays at alveolar ridge or rises to mid-mouth only with jaw closure | 0 |
| Length of lingual frenulum when tongue lifted | | Extension of tongue | |
| More than 1 cm or embedded in tongue | 2 | Tip over lower lip | 2 |
| 1 cm | 1 | Tip over lower gum only | 1 |
| Less than 1 cm | 0 | Neither of above, or anterior or midtongue humps | 0 |
| Attachment of lingual frenulum to tongue | | Spread of anterior tongue | |
| Posterior to tip | | Complete | 2 |
| At tip | | Moderate or partial | 1 |
| Notched tip | | Little or none | 0 |
| Attachment of lingual frenulum to inferior alveolar ridge | | Cupping | |
| Attached to floor of mouth or well below ridge | 2 | Entire edge, firm cup | 2 |
| Attached just below ridge | 1 | Side edges only, moderate cup | 1 |
| Attached at ridge | 0 | Poor or no cup | 0 |
| Total appearance score | | Peristalsis | |
| Function items score<br>▪ 14: perfect score (regardless of *Appearance item* score)<br>▪ 11: acceptable, if *Appearance item* score is 10<br>▪ <11: function impaired<br>Frenotomy should be considered if management fails.<br>Frenotomy necessary if *Appearance item* score is <8. | | Complete, anterior to posterior (originates at the tip) | 2 |
| | | Partial: originating posterior to tip | 1 |
| | | None or reverse | 0 |
| | | Snapback | |
| | | None | 2 |
| | | Periodic | 1 |
| | | Frequent or with each suck | 0 |
| | | Total function score | |

Prevalence of neonatal ankyloglossia in a tertiary care hospital in Spain: a transversal cross-sectional study - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Hazelbaker-Assessment-Tool-for-Lingual-Frenulum-Function-HATLLF-15_fig2_343677587 [accessed 13 Mar, 2023]

# Tongue Embryology

- Tongue develops between 4 – 7 weeks of gestation
- Contributions from all 4 pharyngeal arches and their nerves
- Fusion of bilateral tissue buds from floor of the mouth
- Buds fuse from back to front
- Apoptosis ( programed cell death ) separates tongue from floor of mouth
- The frenulum is a remnant of this process with a variable degree of persistence

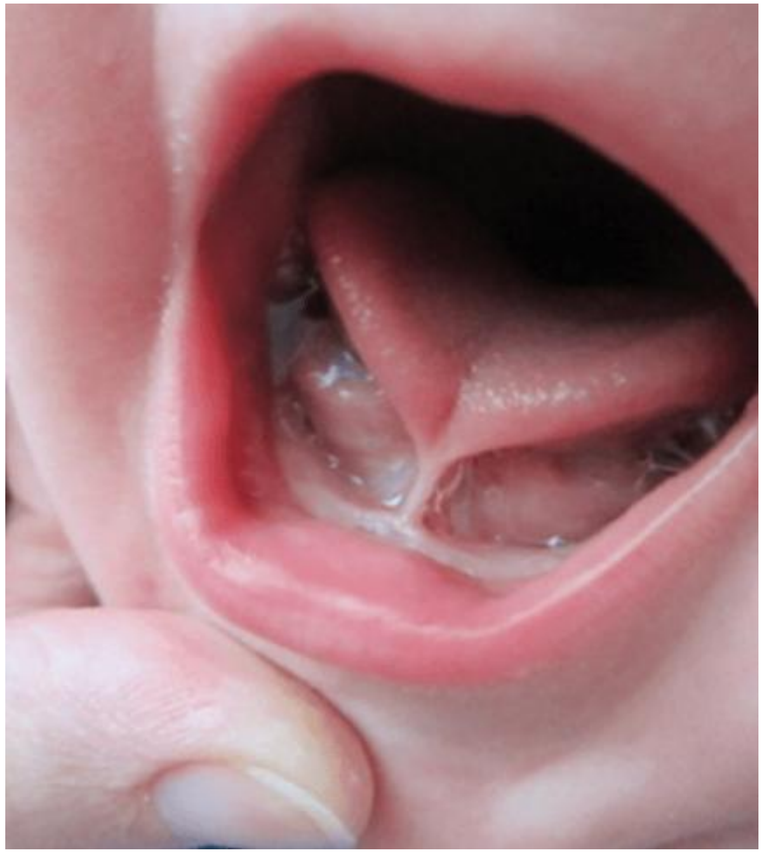


# TONGUE - TIE

- Ankylo = stiff , fused
- Glossia = [gk] tongue

- What is tongue – tie and when is it relevant?

- Breastfeeding in newborns
- Speech in toddlers / children
- Social issues in teens



# HISTORY OF TONGUE TIE

- Tongue tie has been described in ancient texts
- In medieval times , midwives competed with surgeons :
  - midwives used fingernail
  - surgeons used instruments
- Historically 1 – 3 % have congenital tongue - tie

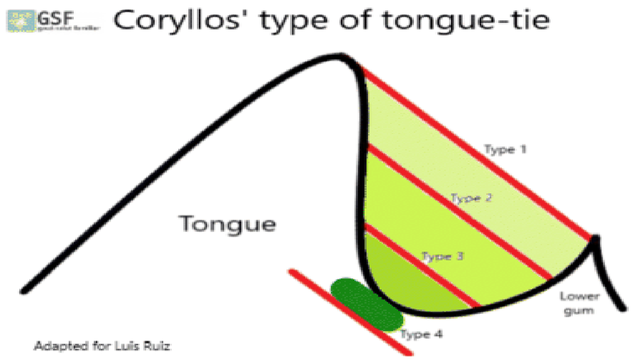
# WHAT STARTED THE UPWARD TREND IN DIAGNOSIS OF TONGUE TIE ?

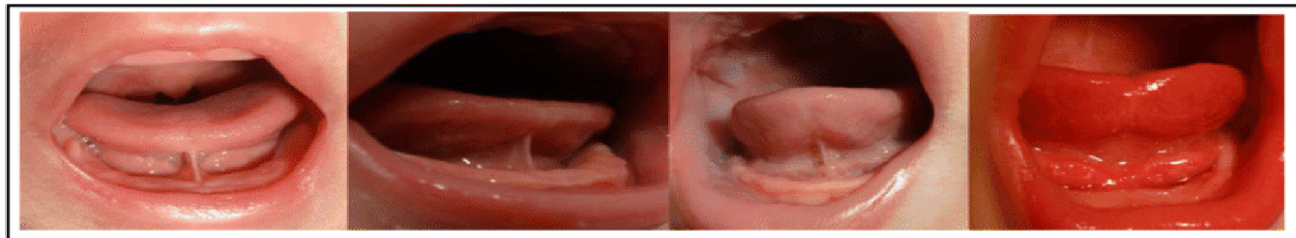
- AAP publication in 2004 on breastfeeding and tongue – tie by Elizabeth “ Betty ” Coryllos , MD et. al.
- Report gives no explanation or data to substantiate a new classification system
- “She has performed over 500 frenotomies since 1953 and has found the results to be satisfactory in all cases , and excellent in most , with few complications.”

# Coryllos Classification

Types of ankyloglossia according to Coryllos [8].

- Type 1: Insertion of the frenulum to the tip of the tongue.
- Type 2: Insertion of the frenulum slightly (two to four mm) behind the tip of the tongue.
- Type 3: Thickened frenulum attached to the mid-tongue and the middle of the floor of the mouth, usually tighter and less elastic.
- Type 4: Thick, shiny and very inelastic submucosal frenulum that restricts movement at the base of the tongue.



Type 1 Type 2 Type 3 Type 4

GSF

Types 1 and 2, considered "classical" tongue-tie, are the most common and obvious tongue-ties. Types 3 and 4 are less common, and since they are more difficult to visualize, they are the most likely to go untreated. Photographs taken by Dr. Luis Ruiz-Guzmán after obtaining written permission from the infants' parents.

Prevalence of neonatal ankyloglossia in a tertiary care hospital in Spain: a transversal cross-sectional study - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Types-of-ankyloglossia-according-to-Coryllos-8-Type-1-insertion-of-the-frenulum-to_fig1_343677587 [accessed 13 Mar, 2023]

# FACTORS INCREASING DIAGNOSIS OF TONGUE TIE

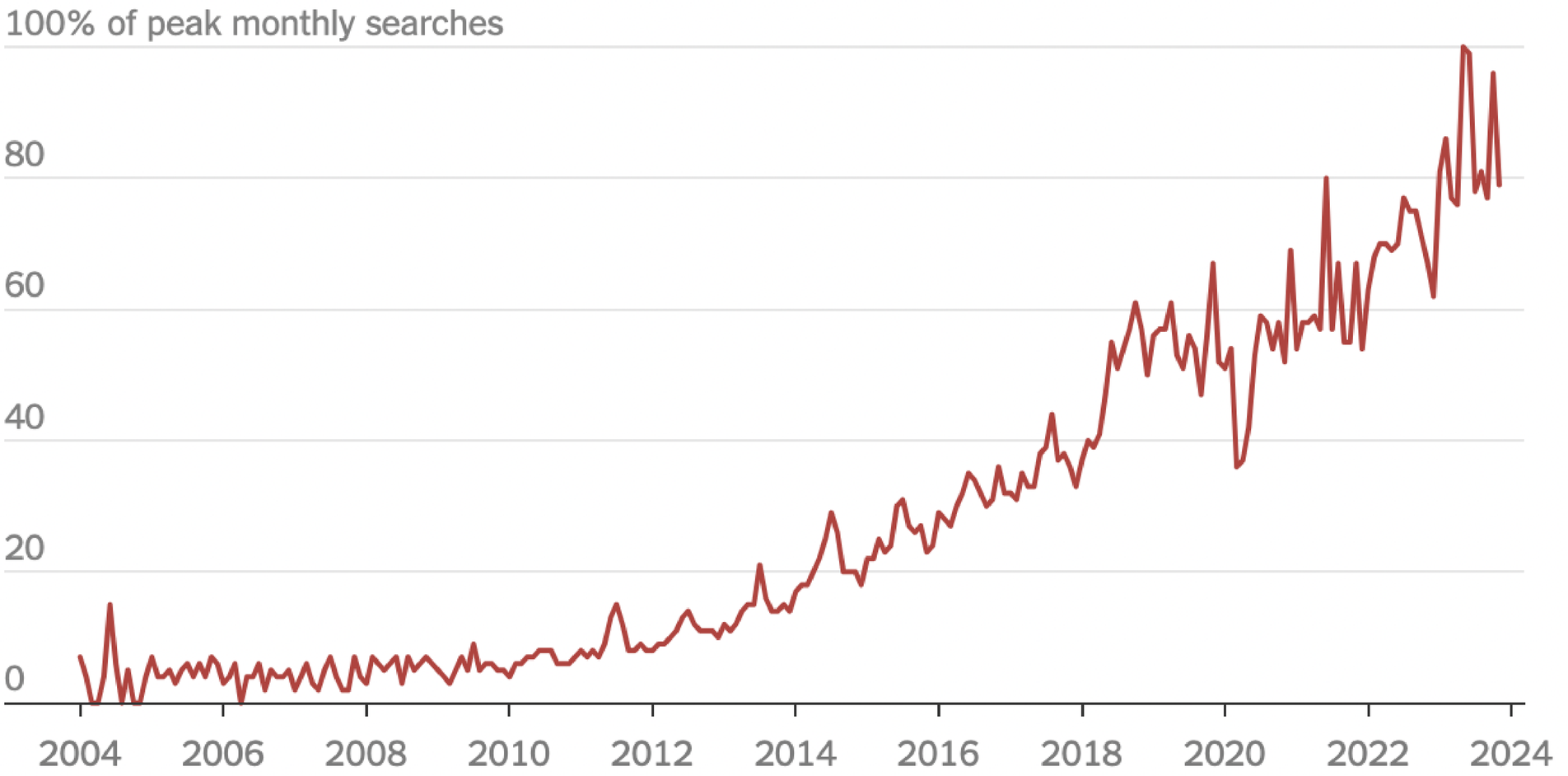
- Increased interest in breastfeeding by mothers
- Pressure by lactation consultants on mothers to breastfeed
- Social media pressure to breastfeed
- Infant formula shortages and cost of infant formula

- From 1997 to 2012 increased diagnosis in U.S. of tongue tie by 834 % (The Atlantic 2019)
- What percentage of infants have tongue tie ?

  Pediatricians – 10% , Lactation consultants – 70% (The Atlantic 2019)

# Searches for “Tongue Tie” Have Steadily Risen

Relative monthly Google search volume for the term “tongue tie” in the U.S.




Source: Google • By The New York Times

# WHAT IS POSTERIOR SUBMUCOSAL TONGUE – TIE ?

- Anything that is not anterior tongue – tie
- A sophisticated condition that can only be diagnosed by expert anatomists
- Where the root of the frenulum restricts upward movement of the tongue even though it looks and feels normal
- It does not exist

# Tongue tie : To release or not release?

## Evaluating the literature :

- **Treatment outcome measures:**
  - **Breastfeeding Self-Efficacy Scale (BSES)**
  - **Infant Breastfeeding Assessment Tool (IBFAT)**
  - **Latch , Audible swallowing , Type of nipple , Comfort , Hold (LATCH) tool**

- **AAO Clinical Consensus Statement (2020) :**
  **The maternal - infant breastfeeding dyad should be recognized as a vulnerable patient population.**

- **Care should be taken to ensure adequate support services, education and counseling, and shared decision - making.**

Messner AH, Walsh J, Rosenfeld RM, et al. Clinical Consensus Statement: Ankyloglossia in Children. Otolaryngology–Head and Neck Surgery. 2020;162(5):597-611. doi:10.1177/0194599820915457

Walsh, Jonathan, and Margo McKenna Benoit. "Ankyloglossia and Other Oral Ties." *Otolaryngologic Clinics of North America*, vol. 52, no. 5, Oct. 2019, pp. 795–811., https://doi.org/10.1016/j.otc.2019.06.008.

- **Many poor studies with outcome measures as subjective maternal report of improved LATCH and decreased nipple pain**

# TYPICAL REPORT IN THE LITERATURE

**Retrospective review of 618 patients from a dedicated breastfeeding difficulty clinic ( Pransky et al, Int J Ped Oto. 2015 )**

- **47% anterior ankyloglossia alone**
- **19% posterior ankyloglossia alone**
- **6% anterior ankyloglossia and upper lip tie (ULT)**
- **5% posterior ankyloglossia and ULT**
- **2% ULT alone**
- **21% no anomaly**
- **Improvements in breastfeeding were reported in 78% after anterior ankyloglossia release, 91% after posterior ankyloglossia release and 100% after ULT release**

**Limitations: lack of control group, multiple diagnoses / procedures performed in combination, subjective outcome measures**

# RANDOMIZED CONTROLLED TRIAL

**SOUTHAMPTON , UK**

- **57 newborns with tongue – tie (25 - 100 %) and breastfeeding difficulty :**
- **28 released : 27 improved and fed normally**
- **29 controls : 1 improved and 28 did not within 2 days -> All offered release and performed with improvement in 27 of 28**
- **( improvement based on maternal report )**
- **Deficiencies of study :**

  **(1) wide range of tongue – tie diagnosis**

  **(2) no objective report of improvement**

**( Hogan M , et al. J Paediatr Child Health 2005 ; 41 : 246 – 250 )**

# DOUBLE – BLIND RANDOMIZED CONTROLLED TRIAL

## SOUTHAMPTON , UK ( SAME GROUP)

- 57 breastfed babies ( 5 – 115 days old , mean 32 days old ) : both maternal reporting and independent observer reporting results
- 27 released : 21 with immediate improvement in latch by maternal report
  ( only 50 % improvement by independent observer )
- 30 controls : 14 improved by maternal report
  ( 40 % improvement by independent observer )
- 51 % still breastfeeding at 3 mo follow up compared to national average of 29 %
- Deficiencies of study :

  (1) conflicting results between maternal report and independent observer

  (2) degree of tongue – ties not disclosed

( Berry J , et al. Breastfeeding Medicine 2012 ; 7 : 189 – 193 )

# TONGUE – TIE AND BREASTFEEDING

## THAI STUDY

- Prospective study of 328 newborns average age 50 hrs
- Maternal nipple pain scores at 1 day and 1 week : 0 (none) -> 10 (high) [ low is best ]
- LATCH scores at 1 day and 1 week : 0 (poor) -> 10 (best) [ high is best ]
- Severe tongue – tie 142 , Moderate 180 , Mild 6

- NPS : Pre – 5 , 1 day – 2 , 1 week – 1
- LATCH : Pre – 6.67 , 1 day – 8.59 , 1 week – 8.80

- No control group

( Wakhanrittee J , et al. Pediatr Surg Int 2016 ; 32 : 945 – 952)

# Consider frenulectomy when…

- Lingual frenulum appears anteriorly anchored to tip of tongue or near tip of tongue on exam
- Mother reports painful latch, inefficient milk transfer, nipple trauma
- There is NO concern for Robin sequence ( micrognathia with glossoptosis ) or neuromuscular disorder

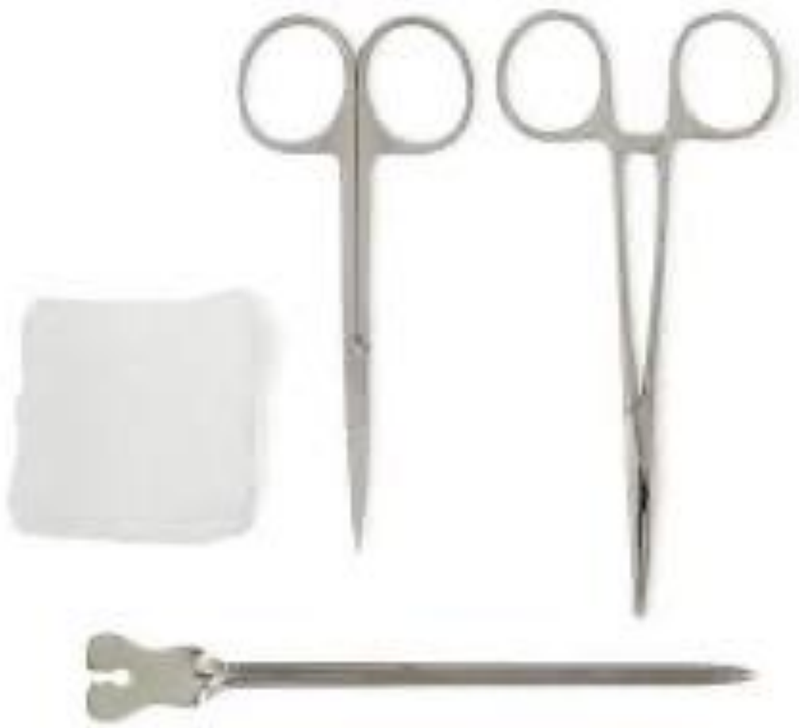
- Intervention is not urgent unless infant is unable to bottle feed, although earlier intervention is favored in order to reduce :
  - maladaptive compensatory maneuvers
  - decreased maternal milk supply

- Main goal is to work with infant's anatomy, fix the treatable factors, and achieve maximum safe release

Messner AH, Walsh J, Rosenfeld RM, et al. Clinical Consensus Statement: Ankyloglossia in Children. Otolaryngology–Head and Neck Surgery. 2020;162(5):597-611.

# Frenulectomy Procedure

- Tolerated well in-office until at least 3 months, possibly 6 months of age (before baby teeth erupt )
- Oxymetazoline or silver nitrate / cautery on hand as needed to reduce any post-procedure bleeding
- Frenulectomy is commonly accepted as safe; however serious complications such as severe bleeding, infection, and glossoptosis have been reported
- Immediate breastfeeding after release is recommended in order to stop bleeding, soothe baby and get feedback from mom



https://mms.mckesson.com/product/1079109/Medline-MNS9545

# Measurable Benefits

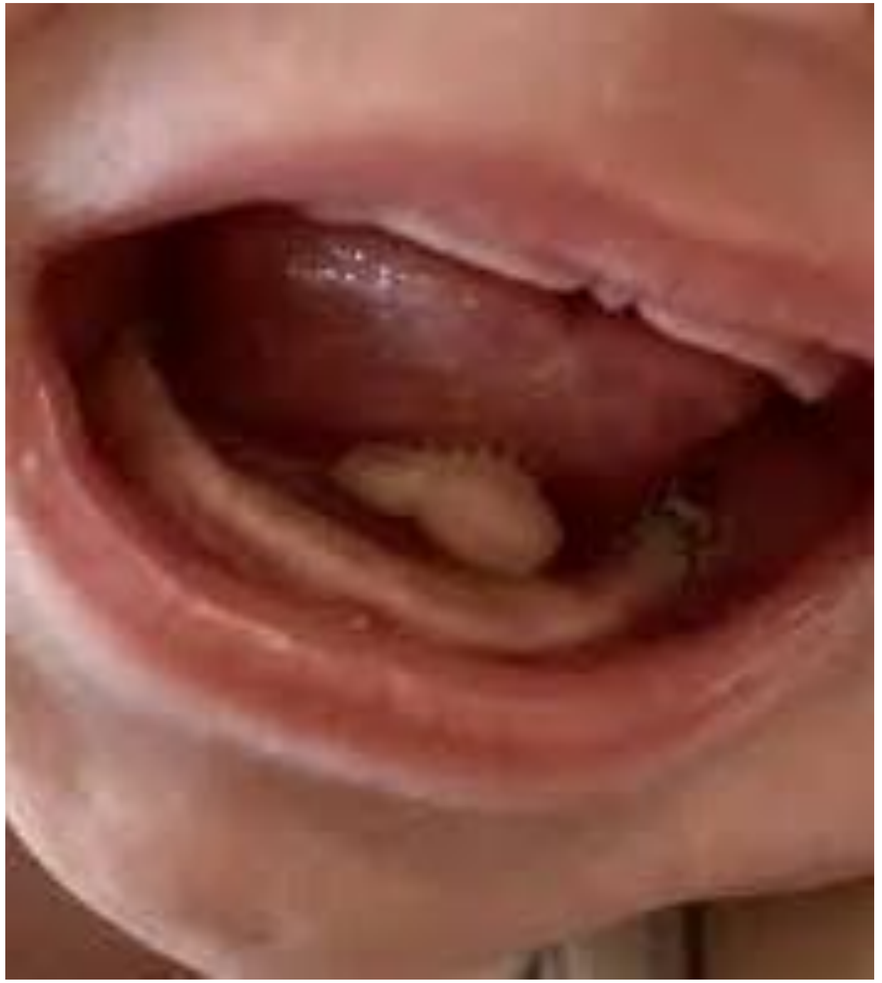
- Increase post-frenulectomy in:
  - Mean infant milk intake (50.5 ml —> 69.1 ml)
  - Mean infant transfer rate (5.6 ml/min —> 10.5 ml/min)
  - mean maternal 24 hour milk production (455 ml —> 615 ml)


Milk Equation from Making More Milk by Lisa Marasco, MA, IBCLC, FILCA, and Diana West, BA, IBCLC

Geddes DT, Langton DB, Gollow I, Jacobs LA, Hartmann PE, Simmer K. Frenulotomy for Breastfeeding Infants With Ankyloglossia: Effect on Milk Removal and Sucking Mechanism as Imaged by Ultrasound Pediatrics 2008;122:e188–e194

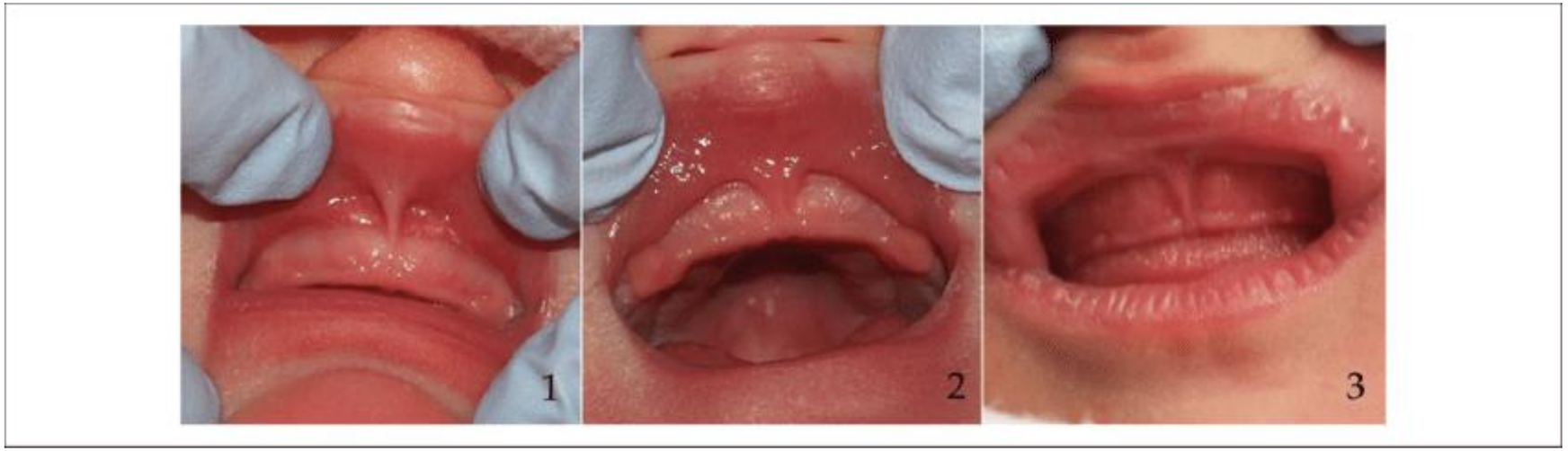
# COMPLICATIONS OF TONGUE – TIE RELEASE

- **Re – scarring with tongue tethering**
- **Bleeding**
- **Granuloma formation requiring revision surgery**
- **Disruption of submandibular papillae**



# SUPERIOR LABIAL ( MAXILLARY ) FRENULUM

## What is a lip tie?




Stanford superior labial frenulum classification :
Type 1 - Insertion of the frenulum is near the mucogingival junction
Type 2 - Insertion is along the mid attached gingiva
Type 3 - Insertion is along inferior margin at the alveolar papilla, and can continue to the posterior surface

The Superior Labial Frenulum in Newborns: What Is Normal? - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Stanford-superior-labial-frenulum-classification-Type-1-Insertion-of-the-frenulum-is_fig1_318678746 [accessed 20 Mar, 2023]

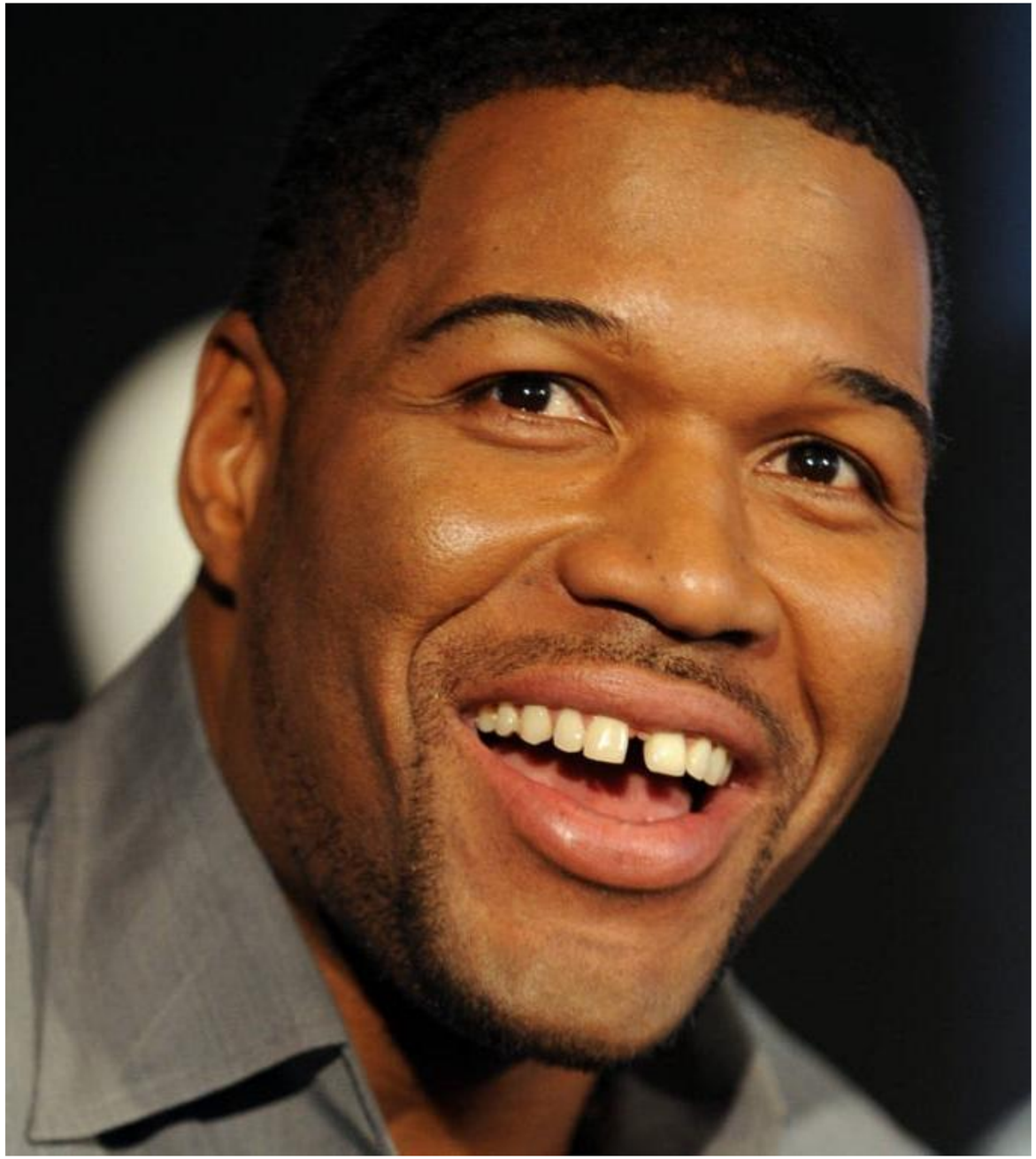
# SUPERIOR LABIAL FRENULUM

- **AAO Consensus Statement (2020) :**

**- Presence of an upper lip frenulum is normal in an infant**

**- Upper lip tie has an unclear relationship to breastfeeding difficulties**

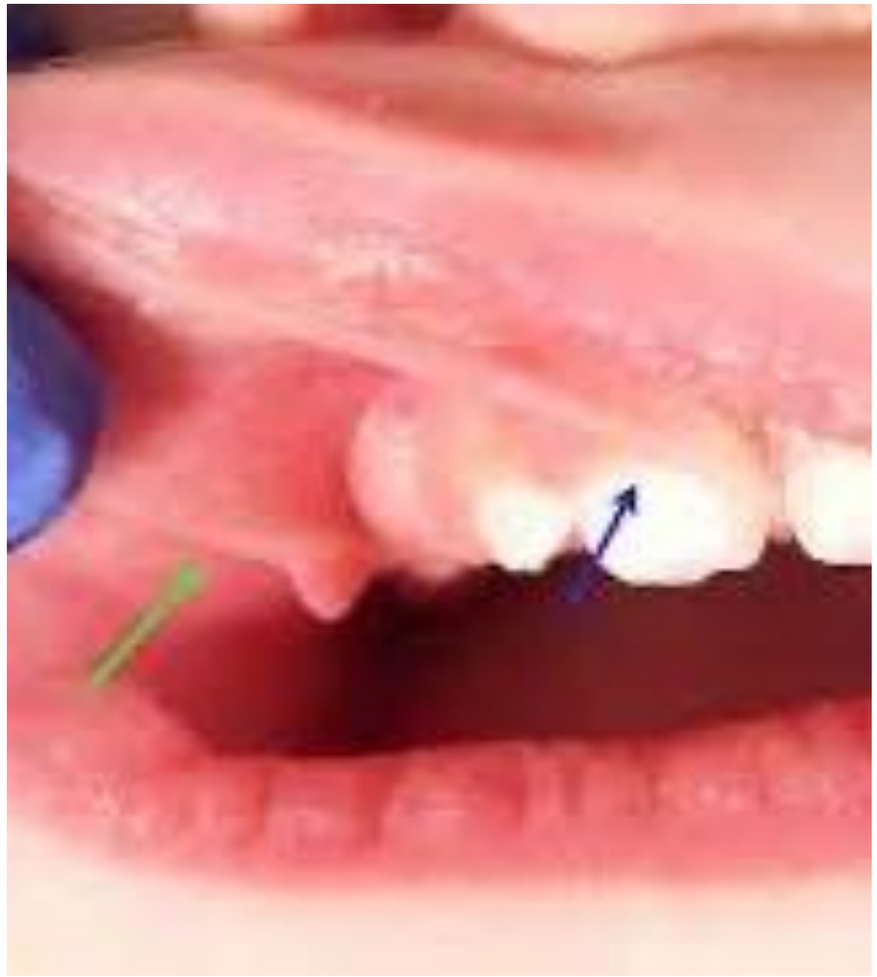
**- Upper lip frenotomy will not prevent the occurrence of an upper inter-incisor diastema**



# What is a buccal tie?

- Buccal frena are small connective tissue folds between the buccal mucosa and the maxillary or mandibular gingiva located between the canines and premolars
- AAO Clinical Consensus Statement (2020) :

There is no evidence to support the diagnosis of buccal ties.

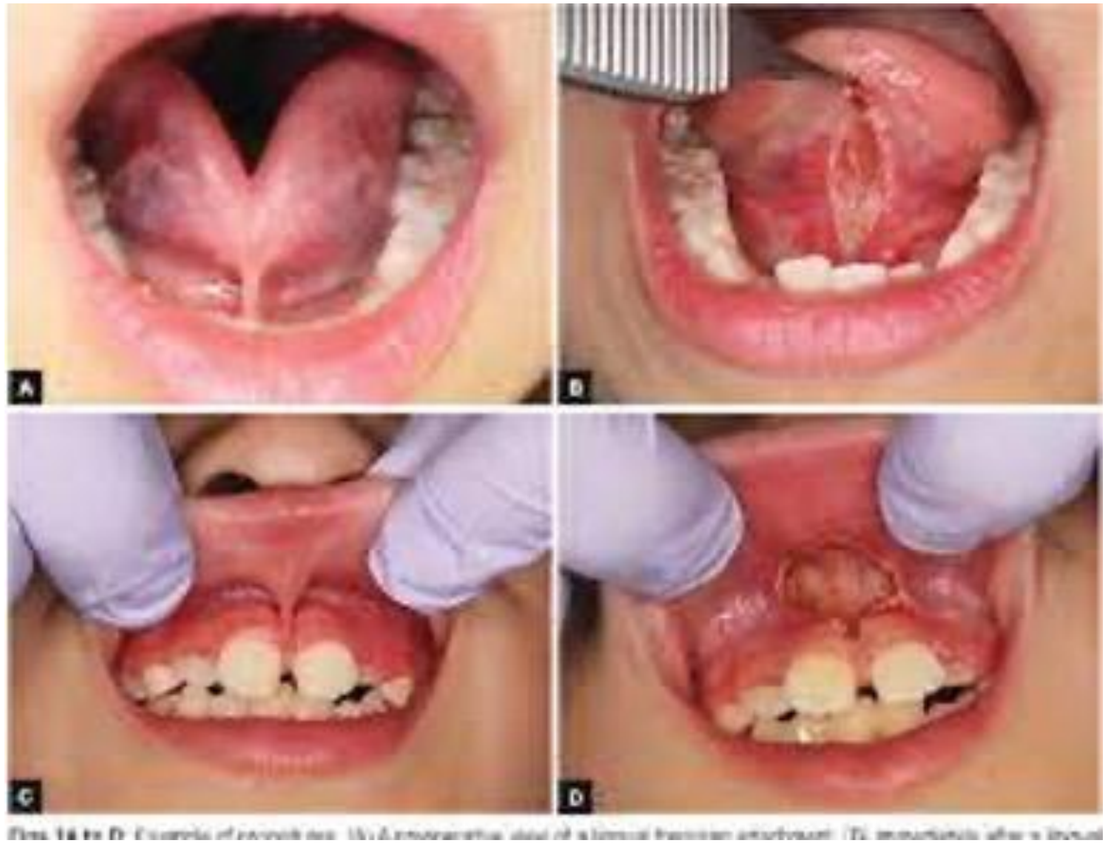


# This Is The Problem!

**“It is difficult to get a man to understand something when his income depends on his not understanding it .”**

**- Upton Sinclair, author and social critic**

# Laser Dental Surgery

## Tongue-Tie Dental | Laser Frenectomy | Connecticut | NY ...

At **Tongue-Tie Dental**, we use the LightScalpel CO2 **laser** to provide lip and **tongue-tie** releases (frenectomies) to patients of all ages, starting with newborns.

Missing: ~~office~~ | Show results with: office

Dental Doctors of Somerset

https://www.ddsct.com › general-family-dentistry › fre...

## Frenectomy | Dentist in Glastonbury, CT

If you **have** a lip or **tongue tie**, our **dentists** can perform a **frenectomy** in Glastonbury, **CT**, to resolve the problem and improve your oral function.

stamforddentist.com

https://stamforddentist.com › frenectomy

## Frenectomy | Breastfeeding Issues | Dentist in Stamford, CT

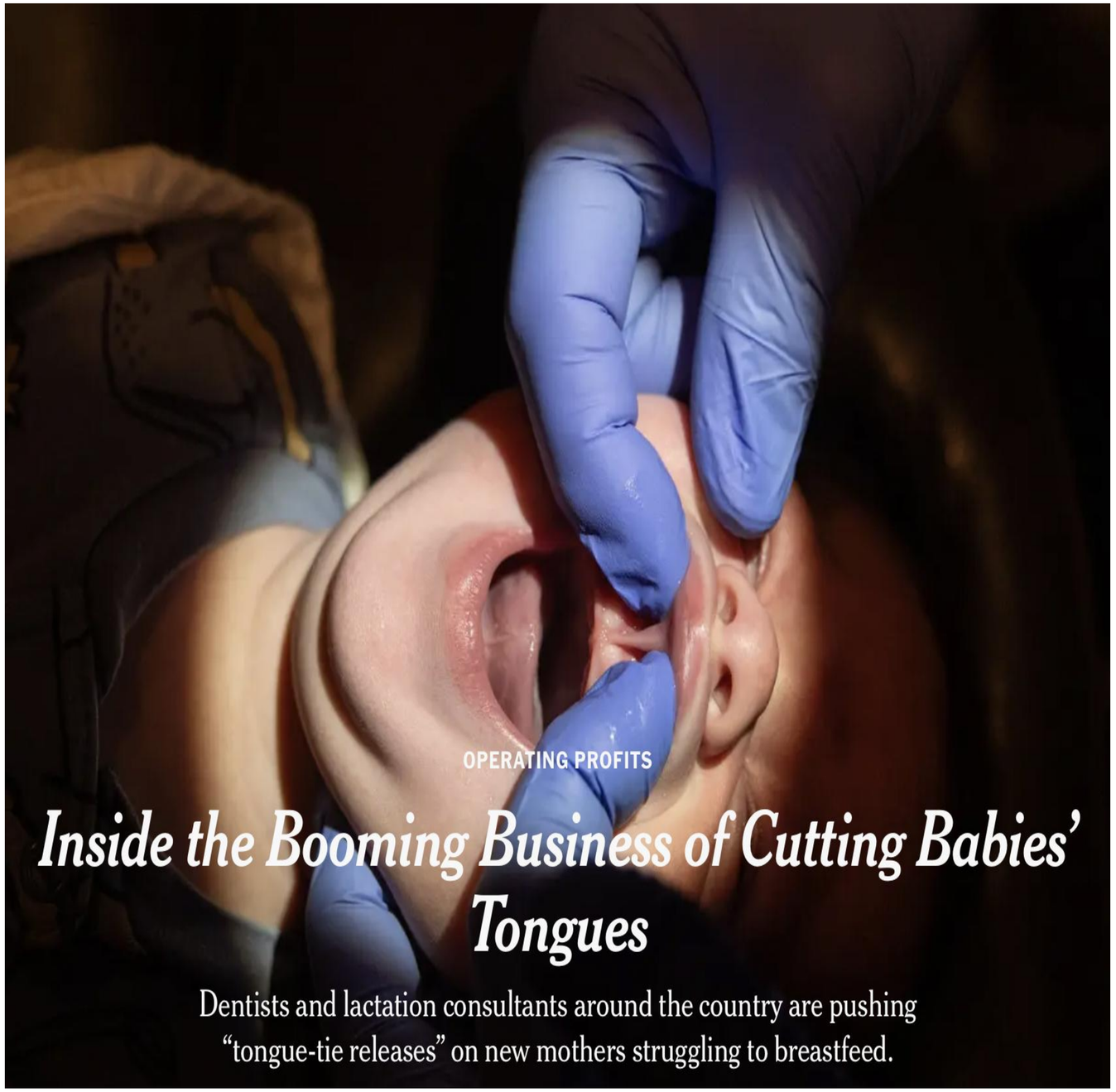
One of Dr. Kundel's essential procedures, a quick **laser** treatment fixes infant breastfeeding, nutritional problems, colic, reflux, sleep apnea and more...

Smile Ark Pediatric Dentistry

http://www.smilearkct.com › services › frenectomies

## Fairfield Frenectomies

At Smile Ark Pediatric **Dentistry** in Fairfield, we use **laser** technology to perform gentle, painless




One company, Biolase, sells an $80,000 laser machine. In April, it hosted a conference at a resort in Scottsdale, Ariz., for more than 100 pediatric dentists and their colleagues. It was called "Tequila and Tongue Ties."
Before rounds of tequila shots and margaritas, attendees were trained on how to perform tongue-tie releases and use social media to build their businesses. Dentists posed for photos with bottles of tequila against a backdrop that read, "Nacho average dental meeting."

**By Katie ThomasSarah Kliff and Jessica Silver-Greenberg**
Reporters traveled to Boise, Idaho, and observed tongue-tie surgery in Manhattan.
•Published Dec. 18, 2023Updated Dec. 20, 2023

## BOBBY GHAHERI, MD

Just as his name implies, Dr. Ghaheri hails from the great land of southwestern Ohio. He did his undergraduate training in Spanish and Anthropology at The Ohio State University, and remained there for medical school. In 2002, he and his wonderful wife relocated to Portland, Oregon, where he did his residency training in otolaryngology/head and neck surgery at Oregon Health Sciences University. In

My goal is to get everyone who is involved in improving breastfeeding outcomes to step back and use a practical approach while combining that with a knowledge of anatomy. Many of us know what the ideal latch looks like; the flanging upper lip is part of that ideal latch. If an anatomical problem limits the ability to form an ideal latch, and a simple procedure exists to completely change that ability, I maintain that it should be done. With time, we will generate more data. But I will not allow the lack of data to paralyze me in treating babies and moms who need help now.

Dr. Ghaheri agreed. “You absolutely do not need a laser to perform a posterior tongue tie release. You just need to know how to do it safely.” Dr. Ghaheri prefers to use the laser to do these procedures because of the volume of cases he performs. “Probably 90% of my practice is performing frenotomies.”

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# AAP: When breastfeeding issues arise in infant with tongue-tie, don't jump to surgery

by **Jennifer Thomas, M.D., M.P.H., FAAP**

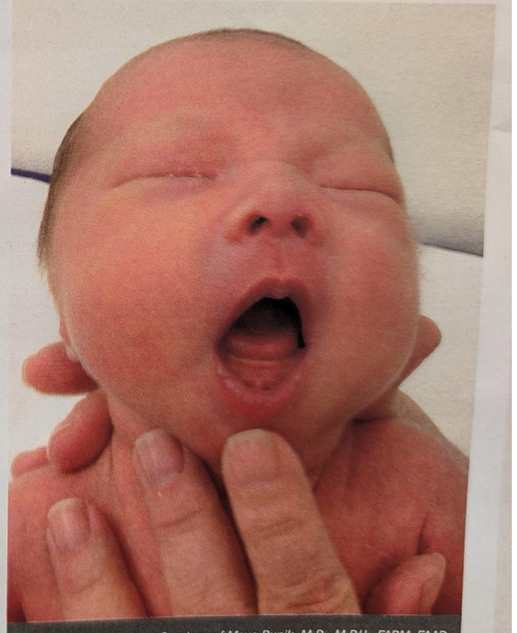
AAP Clinical Report

The parents of a 5-day-old infant come in for a preventive care visit. The mother is committed to breastfeeding but says she is having pain when the baby latches. One lactation consultant in the hospital said the baby has a tongue-tie, but another said the baby does not. The mother's online communities keep asking her if the baby has been "checked for ties." The family has searched online for information on tongue-, lip- and cheek-ties but are overwhelmed. They ask you to help with the next steps.

Studies show a growing number of infants are being diagnosed with ankyloglossia, a congenitally tight lingual frenulum that limits the motion of the tongue. Performance of frenotomy to release tongue-ties also is rising.

The increased rate of frenotomy is fueled partly by economic incentives for health care providers, which has led to a surge in the number of clinics and specialists offering tongue-tie surgeries. In addition, social media has increased awareness of ankyloglossia, and online communities often pressure parents to seek surgical procedures when breastfeeding difficulties arise.

*See Tongue-tie, page 8*



*Courtesy of Maya Bunik, M.D., M.P.H., FABM, FAAP*

When a baby's tongue does not extend beyond the gums, the mother may experience pain during breastfeeding, and milk transfer may be ineffective.

## Back to school: Pediatricians can play

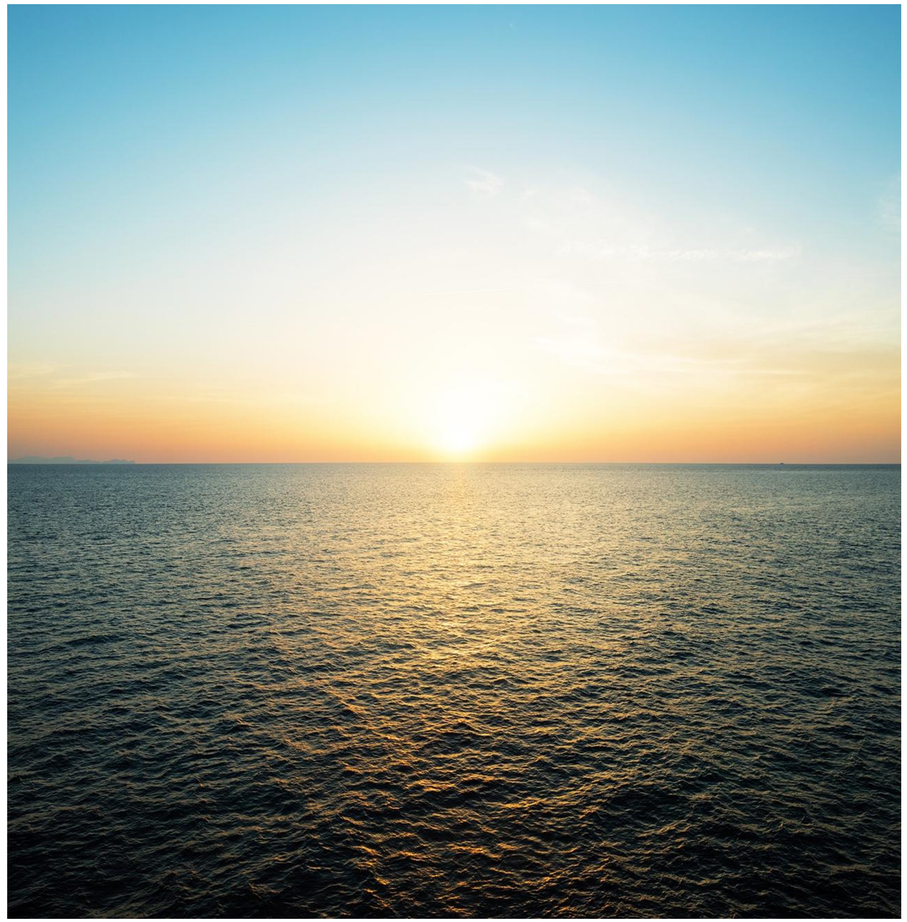
# Follow up: patients recently seen in ENT clinic for evaluation of ankyloglossia :

Outcomes:

- *3 week old late preterm (36 weeks GA) referred for "posterior tongue tie"*
  - Adequate tongue mobility on exam, successful latch in office. Counseled regarding feeding strategies, measures to increased maternal milk supply. No tongue tie release was performed.
- *4 month old referred for "feeding difficulties". Family speaks Spanish.*
  - Classic heart-shaped appearance of tongue on exam c/w grade I ankyloglossia. Limited tongue mobility in all directions. Tongue tie release was performed.
- *4 week old referred for "shallow latch"; second opinion following diagnosis of 6 tethered oral tissues (tongue tie, lip tie, buccal tie x 4) by pediatric dentist*
  - Breaks latch often while nursing. Lingual frenulum ~2mm from tip of tongue; c/w grade II ankyloglossia. Upper labial frenulum is prominent; baby able to flare upper lip when latched. Tongue tie release was performed.
- *7 week old with GERD and torticollis, referred for "difficulty breastfeeding and poor weight gain". Prior evaluations by lactation counselor x 2, chiropractor, physical therapist with differing diagnoses*
  - Lingual frenulum anchored 2-3 mm from tongue tip. Adequate range of motion of tongue on exam. Tongue tie release was not performed. Mother opted to work with lactation and SLP.

# CONCLUSIONS

- There are multiple maternal and infant factors that may affect breastfeeding
- The perinatal period can be a stressful and emotional time and parents may be looking for a “quick fix” though breastfeeding issues are often multifactorial
- A thorough oral exam and observation of breastfeeding is essential to aid in diagnosis
- Some studies support the efficacy of tongue tie release to improve breastfeeding outcomes
- There is NO current conclusive data to support the release of posterior tongue band or superior labial frenulum in order to improve infant feeding difficulties
- There is NO such thing as a “buccal tie”



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# Questions ?

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