RECOMMENDATIONS: *CLINICAL PRACTICE GUIDELINE*

Evidence-Based Clinical Practice Guideline for Assessment and Management of Ankyloglossia in Infants With Breastfeeding Difficulties

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Abstract: ***Purpose:*** *To provide evidence-based recommendations for managing infants with restrictive lingual frenum and breastfeeding difficulties.* ***Methods:*** *Recommendations were informed by 2 recent systematic reviews regarding outcomes such as the diagnostic criteria for ankyloglossia, association of ankyloglossia with feeding difficulties, and evidence for surgical release of the lingual frenum. The Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) approach guided consensus on problem prioritization, certainty of evidence, benefit-risk balance, patient values, acceptability, and feasibility.* ***Results:*** *Twelve conditional recommendations were developed addressing the diagnosis and management of symptomatic ankyloglossia. Both anatomical and functional assessments were advised for a comprehensive assessment of the tongue. Evidence suggested an association between restrictive lingual frenum and feeding difficulties and potential benefits of frenotomy on feeding in carefully selected cases. This document provides guidance on preferred surgical techniques, postoperative care, and counseling regarding possible adverse events, aiming to support clinical decision making for dental professionals.* ***Conclusions:*** *All recommendations were conditional and grounded in very low-certainty evidence, underscoring the need for high-quality research. Clinicians should engage in multidisciplinary, shared decision making with parents to determine the most appropriate intervention from available options, incorporating the family's values and preferences.* *(Pediatr Dent 2026;48(4):250-63) Received January 30, 2026 / Last Revision April 3, 2026 / Accepted April 6, 2026*

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Plain language summary

Purpose. To offer clear and practical guidance for clinicians who treat babies with tongue-tie when breastfeeding problems are present.

Background. Tongue-tie can limit a baby's tongue movement and may contribute to breastfeeding difficulties, poor latch, and nipple pain for the mother. There is ongoing debate about how best to diagnose and treat this condition.

Study characteristics. A group of experts reviewed 2 recent high-quality systematic reviews summarizing all available scientific research on tongue-tie in infants and its effect on feeding. The group used a structured process (called GRADE) to evaluate the strength of the evidence and develop recommendations.

Key results. The proposed recommendations emphasize the following:

- Using a combination of methods to check how tongue looks or how well it moves to see if a baby is truly tongue-tied.
- Understanding that tongue-tie might be 1 of the reasons a baby is having trouble breastfeeding.
- Thinking of tongue-tie release as an option only when feeding issues persist after getting help from experts like lactation consultants.
- Having a clear conversation with the parents about the possible benefits and risks of the procedure.
- Recognizing medical scissors, laser, or electrosurgery as acceptable ways to release tongue-tie.
- Not using numbing gels or creams before the procedure in babies.
- Talking about concerns with follow-up stretching exercises, since there is not enough proof that they help, and they might cause discomfort or harm.

- Explaining that while problems are rare, tongue-tie release procedure can sometimes lead to minor bleeding, mouth sores, scarring, swelling, or a fussy baby.

Conclusions. Because current scientific evidence is limited, all recommendations are conditional. Dentists and parents should work together, ideally with lactation consultants and pediatric health care providers to decide on the best, individualized plan for each baby based on clinical findings and family preferences. More high-quality research is needed to guide future care.

Guideline

Breastfeeding difficulties can arise from a variety of causes, including the mother's breastfeeding technique and milk supply and the infant's ability to latch and suckle properly. Many breastfeeding dyads experience difficulties, including sore nipples, milk stasis in the breast, and inadequate infant weight gain due to inefficient milk transfer at the breast.[1] While some infants may experience feeding difficulties due to a restrictive lingual frenum (frenulum) attachment, known as ankyloglossia or tongue-tie, surgical intervention is not always necessary.[2,3] Early identification of potential breastfeeding problems is crucial for ensuring successful lactation outcomes.[4]

When making clinical decisions, it is essential to recognize oral frena as anatomical structures that link intraoral structures.[5] The lingual frenum connects the underside of the tongue to the floor of the mouth and can attach at the tongue's tip, just posterior to the tip, mid-tongue, or further posteriorly. Recent anatomical research has revealed that the lingual frenum is not a discrete band but rather a dynamic midline fold of tissue (fascia) located beneath the oral mucosa that forms when the tongue elevates.[6]

The American Academy of Pediatric Dentistry (**AAPD**)[5] defines ankyloglossia as "a congenital developmental anomaly of the tongue characterized by a short, thick lingual frenum resulting in limited tongue movement (partial ankyloglossia) or by the tongue appearing to be fused to the floor of the mouth (total ankyloglossia)." According to the American Academy of Otolaryngology-Head and Neck Surgery (**AAO-HNS**),[7,8] ankyloglossia is defined as "a condition of limited tongue mobility caused by a restrictive lingual frenum". The Academy of Breastfeeding Medicine (**ABM**)[1] further clarifies that a visible frenum without associated feeding dysfunction represents a normal anatomical variation rather than a pathological restriction. Similarly, the American Academy of Pediatrics (**AAP**)[9] describes ankyloglossia as a variation within normal oral anatomy, noting that symptomatic cases are characterized by a restrictive lingual frenum causing breastfeeding difficulties that persist despite lactation support.

Providers (pediatric dentist, dentist, oral surgeon, otolaryngologist, pediatric otolaryngologist) often perform a simple incision or a full release of oral frena in infants, depending on their judgment, but inconsistent use of terminology in scientific literature complicates the assessment of effectiveness by the extent of release. The AAPD's policy statement[5] provides explicit definitions: frenectomy (or frenulotomy) is defined as a simple cutting or incision of the frenum, and frenectomy (or frenulectomy) is defined as complete removal of the frenum, including its attachment to the underlying bone.

Scope and specific objectives. The AAPD intends for this guideline to inform clinicians about evidence-based recommendations for diagnosing and managing a restrictive lingual frenum in infants that contributes to feeding dysfunction. With the direction of the Evidence-Based Dentistry Committee, 14 individuals and 1 librarian were selected to participate in the expert workgroup (**WG**) to formulate a clinical practice guideline based on 2 systematic reviews (**SRs**) of the literature. The WG was comprised of 10 pediatric dentists from private practice and academic settings, 1 pediatrician and breastfeeding medicine specialist, 1 neonatologist, and 2 pediatric otolaryngologists. The WG defined the Participants, Index Test, Reference Standard, Target Condition (PIRT); Population, Exposure, Outcome (PEO); and the Population, Interventions, Comparisons, and Outcomes (PICO) to be assessed and formulated a comprehensive list of relevant clinical questions,[10,11] which were reviewed and approved by the stakeholders including the AAPD's Council on Clinical Affairs, Council on Scientific Affairs, and Evidence-Based Dentistry Committee.

To develop a clinical practice guideline, the WG met between July 2023 and November 2025 to systematically search, select, synthesize, appraise, and contextualize the best available evidence to create evidence-based recommendations.

Clinical questions. Clinical questions asked were: (1) In the context of breastfeeding in infants, what are the diagnostic criteria for symptomatic or restrictive lingual frenum attachment? (2) In infants, does a restrictive lingual frenum influence mother-infant outcomes related to feeding? (3) For infants with feeding difficulties, does the release of restrictive lingual frenum influence the mother-infant feeding outcomes compared to infants with no frenum release? (4) For infants diagnosed with restrictive lingual frenum, does the method of release influence the mother-infant outcomes related to feeding? (5) For infants who have undergone frenum release, does postprocedure care influence the mother-infant outcomes related to feeding? (6) What are the adverse events reported in the mother-infant dyad associated with frenum release in infants?

GLOSSARY of TERMS and ABBREVIATIONS

95% CI: 95 percent confidence interval.
AAO-HNS: American Academy of Otolaryngology-Head and Neck Surgery.
AAP: American Academy of Pediatrics.
AAPD: American Academy of Pediatric Dentistry.
ABM: Academy of Breastfeeding Medicine.
ADA: American Dental Association.
AGREE: Appraisal of Guidelines for Research and Evaluation.
Ankyloglossia (or restrictive lingual frenum or tongue-tie): Lingual frenum causing both anatomic restriction and functional impairment related to mobility (lateralization, lift, extension, spread, cupping, peristalsis, and snapback) of the tongue.
ATLFF: Assessment Tool for Lingual Frenulum Function.
BTAT: Bristol Tongue Assessment Tool.
CDT: Current Dental Terminology.
CO_2: Carbon dioxide.
(EtD): Evidence-to-Decision.
GRADE: Grading of Recommendations, Assessment, Development and Evaluation.
HATLFF: Hazelbaker Assessment Tool for Lingual Frenulum Function.
RCT: Randomized clinical trial.
SMD: Standardized mean difference.
SRs: Systematic reviews.
Symptomatic ankyloglossia: Ankyloglossia associated with feeding difficulties in the mother-infant dyad.
TABBY: Tongue-tie and Breastfed Babies Assessment Tool.
VAS: Visual Analog Scale.
VKDB: Vitamin K deficiency bleeding.
WG: Working Group.

Note: The terminology used throughout this guideline (eg, mother-infant dyad, maternal self-efficacy, maternal nipple pain) reflects the underlying evidence base, which derives exclusively from studies conducted on cisgender mother-infant breastfeeding dyads using outcome measures developed for and studied in this population. The WG acknowledges that lactation and infant feeding occur across diverse family structures and that individuals other than birth mothers may serve as lactating caregivers. Clinicians are encouraged to use affirming language appropriate to each family's circumstances and preferences, while recognizing that the generalizability of these findings to other lactating persons has not been established. Additionally, guidance on medical management of feeding difficulties is beyond the scope of this document.

Search strategy and evidence inclusion criteria. For purposes of guideline development, the WG agreed a priori to use the findings of 2 AAPD SRs[10,11] on diagnosis and management of restrictive lingual frenum associated with feeding difficulties that included a Grading of Recommendations, Assessment, Development, and Evaluations (**GRADE**) level of certainty assessment. Therefore, the WG analyzed data from 2 SRs[10,11] and utilized the GRADE Evidence-to-Decision (**EtD**) Framework[12] to develop a clinical practice guideline. The WG also utilized the SRs' comprehensive literature searches in MEDLINE (PubMed), Ovid MEDLINE, EMBASE, CINAHL, Cochrane Library, and OpenGrey to identify randomized controlled trials (**RCTs**), nonrandomized studies, and SRs to address peripheral issues that were not included in the SRs, such as patient preferences and cost implications.

Assessment of evidence. The WG reviewed a variety of studied outcomes and their assessment methods and ranked them a priori as critical, important (but not critical), and of limited importance. Critical outcomes included diagnostic criteria for ankyloglossia in infants, association of ankyloglossia with feeding difficulties, and feeding difficulties such as nipple pain, latch improvement, and adverse events. Additional outcomes rated as important included method of frenum release, postprocedure care, and feeding outcomes such as maternal self-efficacy, infant weight gain, feeding time, milk transfer, gastroesophageal reflux, oral aversion, quality of life, missed diagnosis, and misdiagnosis.[10,11] Considering the variation in units of measure of outcomes, where possible the authors reanalyzed data and calculated the standardized mean difference (**SMD**) to measure the effect in a standardized manner. To calculate SMDs, the corresponding authors of included publications were contacted for additional information/data as needed. To communicate the findings of the SRs using clinically informative statements, the size of the estimate interpreted from SMDs was categorized as large effect, moderate effect, small important effect (interpreted as statistically significant), or trivial effect (interpreted as small, unimportant, or statistically nonsignificant or no effect).[13] The certainty of the evidence was assessed using the GRADE approach, which recognizes the certainty of evidence as high, moderate, low, and very low based on serious or very serious issues, including the risk of bias, imprecision, inconsistency, indirectness of evidence, and publication bias.[12] The WG evaluated and obtained consensus on the certainty of evidence for each studied outcome.

Values and preferences. Parents (parent, caregiver) of infants with ankyloglossia may view reduced maternal nipple pain, successful latch, maternal comfort, and infant weight gain as important outcomes.[10,11] Families may consider surgical release of lingual frenum acceptable if feeding difficulties are clearly impacting breastfeeding or maternal well-being; however, many prefer to first pursue conservative options, such as lactation support, positioning, and other interventions.[9] Cultural attitudes, previous experiences, and access to lactation services may influence individual preferences. Some parents value potential future benefits for speech or oral motor development, while others place greater weight on avoiding pain or unnecessary early-life procedures.[5]

There is growing concern about the potential for overdiagnosis and overtreatment, particularly given the recent increase in frenotomy rates.[14] Health care providers differ in their weighting of benefits vs harms. The maternal and infant breastfeeding dyad should be recognized as a vulnerable patient population, and care should be taken to ensure adequate support services, education and counseling, and shared decision making.[8] Recent media attention has increased public interest in evidence-based recommendations for assessment and treatment. Although lingual frenotomy is generally considered a safe and well-tolerated procedure, clinicians' recommendations could vary depending on how strongly they value desirable effects, such as reduced nipple pain experienced by breastfeeding mothers and improved breastfeeding outcomes, relative to undesirable effects such as discomfort, bleeding, or procedural complications.[10,11] As with any intervention, this should be a shared decision between the clinician and the parents, incorporating the parents' values and preferences, with attention to the risks and the benefits of each alternative.[1]

Formulation of recommendations. The clinical question(s) informed by the included SRs[10,11] were subject to the clinical practice guideline development process following the Appraisal of Guidelines for Research and Evaluation (**AGREE II**) tool.[15] The recommendations were developed by the GRADE EtD process and are referred to in the current document as *evidence-based recommendations*. As a part of the process, the WG obtained consensus on domains such as priority of the problem, certainty of the evidence, balance between desirable and undesirable consequences, patients' values and preferences, acceptability, and feasibility.[16]

The recommendations presented are primarily based on direct evidence from the included SRs. No recommendation was made for interventions that lacked supporting evidence or if the available evidence had very serious indirectness and/or uncertain applicability. The supporting evidence informing the evidence-based recommendations has been described in the summary of findings sections.

Understanding and interpreting the recommendations. Management decisions for a restrictive lingual frenum causing feeding difficulties in a mother-infant dyad should involve a multidisciplinary team and shared decision making with the parent after informed consent. The formulated evidence-based recommendations aim to help clinicians, clinician educators, parents, and policymakers make informed decisions regarding the management of infant ankyloglossia. The recommendations are intended to aid clinical judgement and not replace it.

The strength of an evidence-based recommendation was assessed to be either strong or conditional, which presents different implications for patients, clinicians, and policymakers (Tables 1 and 2).[11] The recommendations are presented in Table 3. A decision tree has been presented to summarize available evidence and aid clinicians in decision making (Figure).

A recommendation statement with *must* or *shall* indicates an imperative need and/or duty and is an essential or indispensable item/mandatory; a recommendation with *should*

Table 1. GRADE INTERPRETATION OF STRENGTH OF RECOMMENDATIONS[21]

Implications	Strong recommendations	Conditional recommendations
For patients	Most individuals in this situation would want the recommended course of action, and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not.
For clinicians	Most individuals should receive the recommended course of action. Adherence to this recommendation according to the guideline, could be used as a quality criterion or performance indicator. Formal decision aids are not likely to be needed to help individuals make decisions consistent with their values and preferences.	Recognize that different choices will be appropriate for different patients, and that you must help each patient arrive at a management decision consistent with his or her values and preferences. Decision aids may well be useful in helping individuals make decisions consistent with their values and preferences. Clinicians should expect to spend more time with patients when working toward a decision.
For policymakers	The recommendation can be adapted as policy in most situations, including for the use as performance indicators.	Policymaking will require substantial debates and the involvement of many stakeholders. Policies are also more likely to vary between regions. Performance indicators would have to focus on the fact that adequate deliberation about the management options has taken place.
GRADE certainty in the evidence		
High	Very confident that the true effect lies close to that of the estimate of the effect.	
Moderate	Moderately confident in the effect estimate. The true effect is likely to be close to the estimate of the effect.	
Low	Confidence in the effect estimate is limited.	
Very low	Very little confidence in the effect estimate.	

Table 2. INTERPRETATION OF STRENGTH OF RECOMMENDATIONS

Type of recommendation	What it means for families	What it means for clinicians
Strong recommendation for an intervention	The benefits clearly outweigh any downsides; the treatment is likely to help.	This treatment should be routinely offered in most situations, as there is moderate- to high-quality evidence and strong confidence in its effectiveness.
Conditional recommendation for an intervention	The treatment might help; benefits seem to outweigh downsides, but the WG is less certain, or it may depend on the individual.	It may be appropriate in some situations. Consider the patient's values, preferences, and context. Shared decision making is recommended as other interventions may be equally or more effective.
Conditional recommendation against an intervention	The downsides seem to outweigh the benefits; the treatment may not help or may even cause some harm, but it could be right in some specific cases.	It is usually avoided. Clinicians are encouraged to look at alternative options, but it could be considered when other preferred options are unavailable, unsuitable, or declined by the patient. Clinical judgment and individualization are key.
Strong recommendation against an intervention	The downsides clearly outweigh any benefits; the treatment is more likely to fail or harm than help.	This treatment should generally not be provided because the evidence indicates it is ineffective or potentially harmful.

indicates the recommended need and/or duty is highly desirable; and a recommendation with *may* or *could* indicates the freedom or liberty to follow a suggested alternative.[17]

In this guideline, all recommendations are conditional and supported by very low-certainty evidence. To ensure consistency, recommendations addressing process and safety, such as structured assessment, multidisciplinary referral, adverse event monitoring, and lactation support, use *should*, as these reflect professional standards and patient safety obligations that hold independent of the certainty of evidence. Recommendations on diagnosis and therapeutic interventions–such as whether to offer frenotomy, expected outcomes, surgical technique selection, and postprocedure stretching–use *may*, reflecting genuine uncertainty in the benefit-harm balance and the individualized nature of the decision. Clinicians are encouraged to engage in shared decision making with parents, incorporating the best available evidence, clinical expertise, and parental values and preferences.

Recommendations

Clinical question #1. In the context of breastfeeding in infants, what are the diagnostic criteria for symptomatic or restrictive lingual frenum attachment?

Recommendations.

- For mother-infant dyads presenting with suspected infant tongue-tie (ankyloglossia), clinicians should use a structured assessment approach to evaluate both anatomical features and tongue function, with particular attention to how the restriction affects feeding outcomes (conditional in favor, very low certainty of evidence).
- A restrictive lingual frenum in infants, causing both anatomical limitation and functional impairment of the tongue, may be diagnosed as ankyloglossia (conditional in favor, very low certainty of evidence).
- A restrictive lingual frenum in infants may be diagnosed as symptomatic ankyloglossia after a comprehensive evaluation confirms anatomical restriction and functional

impairment of the tongue is associated with feeding difficulties (conditional in favor, very low certainty of evidence).

Summary of findings. The SR[10] included 14 studies (2002-2025) across 5 countries that evaluated 5 different assessment tools for diagnosing restrictive lingual frenum in feeding infants. The Bristol Tongue Assessment Tool (**BTAT**)/Tongue-tie and Breastfed Babies Assessment Tool (**TABBY**), which used anatomical and functional assessments (tongue lift and protrusion) demonstrated favorable psychometric properties across 4 studies,[18-21] with acceptable internal consistency (Cronbach's α=0.708), strong correlation with the Hazelbaker Assessment Tool for Lingual Frenulum Function (**HATLFF**; r=0.89), and a diagnostic threshold score of no more than 5.

Table 3. RECOMMENDATIONS

Recommendations	Strength	Certainty
Clinical question #1. ***In the context of breastfeeding in infants, what are the diagnostic criteria for symptomatic or restrictive lingual frenum attachment?***		
For a mother-infant dyad presenting with suspected infant tongue-tie (ankyloglossia), clinicians should use a structured assessment approach to evaluate both anatomical features and tongue function, with particular attention to how the restriction affects feeding outcomes.	Conditional in favor	Very low
A restrictive lingual frenum in infants causing both anatomical limitation and functional impairment of the tongue may be diagnosed as ankyloglossia.	Conditional in favor	Very low
A restrictive lingual frenum in infants may be diagnosed as symptomatic ankyloglossia after a comprehensive evaluation confirms anatomical restriction and functional impairment of the tongue is associated with feeding difficulties.	Conditional in favor	Very low
Clinical question #2. ***In infants, does a restrictive lingual frenum influence mother-infant outcomes related to feeding?***		
For the mother-infant dyad, a restrictive lingual frenum may be associated with maternally reported feeding difficulties and poor latch. Clinicians should consider referral for evaluation by a multidisciplinary team to support a comprehensive diagnosis of feeding difficulties.	Conditional in favor	Very low
Clinical question #3. ***For infants with feeding difficulties, does the release of restrictive lingual frenum influence the mother-infant feeding outcomes compared to infants with no frenum release?***		
Surgical release of the lingual frenum (frenotomy/frenectomy) may be considered for carefully selected mother–infant dyad experiencing significant feeding difficulties attributed to symptomatic ankyloglossia, where symptoms persist despite comprehensive lactation support, and after discussion of uncertain evidence quality, variable outcomes, and potential risks and benefits of the procedure with the family.	Conditional in favor	Very low
For infants with symptomatic ankyloglossia, surgical release of the lingual frenum may provide improvement in maternal self-efficacy, maternal pain, poor latch, and sucking issues, which may be sustained over time. Clinicians may consider a frenum release procedure as an adjunct to comprehensive feeding support, with realistic expectations about the potential benefits for these feeding difficulties.	Conditional in favor	Very low
Given the limited, conflicting, or contradictory evidence, improvement in tongue movement, feeding time, weight gain, gastric reflux issues, milk transfer, irritability, or infant exhaustion may not be considered as the primary indication for surgical release of the lingual frenum in infants with symptomatic ankyloglossia. Comprehensive feeding support should be the first line of treatment for these feeding difficulties	Conditional in favor	Very low
Clinical question #4. ***For infants diagnosed with restrictive lingual frenum, does the method of release influence the mother-infant outcomes related to feeding?***		
In infants, lingual frenum release with scissors or laser may improve maternal self-efficacy and reduce nipple pain more effectively than electrosurgery. Clinicians should use their expertise, individual patient factors, and parent values and preferences in selecting the method (scissors, lasers, electrosurgery) of surgical release.	Conditional in favor	Very low
Considering the lack of evidence on effectiveness, the absence of established safety guidelines, and the potential risk of methemoglobinemia, clinicians should not use topical anesthetics prior to frenotomy or frenectomy in infants.	Conditional against	Very low
Clinical question #5. ***For infants who have undergone frenum release, does post-procedure care influence mother-infant outcomes related to feeding?***		
For infants who have undergone frenotomy or frenectomy to release symptomatic ankyloglossia, ongoing lactation support for the mother-infant dyad should be maintained, with regular follow-up assessments to monitor wound healing and evaluate resolution of feeding difficulties.	Conditional in favor	Very low
Limited evidence suggests low adherence to post-procedure protocols among mother-infant dyads. Partial compliance with post-release stretching exercises has been associated with potential adverse outcomes, including recurrence, scarring, and bleeding. Given the limited evidence on benefit and potential for harm, postrelease stretching exercises may not be routinely recommended. If considered, the decision should be made through shared decision making, incorporating clinical expertise, individual patient factors, and parent values and preferences, with clear counseling on potential benefits and harms.	Expert consensus	
Clinical question #6. ***What are the adverse events reported in the mother-infant dyads associated with frenum release in infants?***		
Adverse events associated with frenum release in infants, although uncommon, may include bleeding, ulceration, scarring, swelling, and irritability. Clinicians should implement adverse event monitoring and facilitate shared decision making, including family counseling on bleeding precautions and expected patterns of healing.	Conditional in favor	Very low

The HATLFF[22-25] showed significant limitations, with 55% to 63% of cases being unclassifiable and only moderate inter-rater reliability (κ=0.44 to 0.49). The Neonatal Tongue Screening Test (NTST) demonstrated poor psychometric properties with low internal consistency (α=0.28) and substantial test-retest instability.[21,22] The New York University-Tongue-Tie Case Definition (NYU-TTCD) achieved 93% expert consensus but lacked clinical validation,[26] while the Coryllos classification showed variable prevalence rates (62% to 78%) across studies.[27,28]

While evidence favors the use of assessment tools that include both comprehensive anatomical and functional evaluations, none of the available tools delivers a truly comprehensive assessment. Additionally, all assessment tools received very low certainty ratings due to risk of bias, limited validation, and observational study designs.

Remarks. Current evidence reveals 5 different assessment tools with no validated consensus instrument, creating a 3.5-fold variation in prevalence estimates (4.8% to 17%) that significantly impacts resource allocation and clinical decisions. This leads to unreliable identification, with potential variation in diagnoses based on provider, tool, or setting, contributing to both missed cases needing intervention and unnecessary procedures.

Standardized assessment can improve diagnostic consistency by checking for anatomic restriction, functional impairment of the tongue (lateralization, lift, extension, spread, cupping, peristalsis, and snapback), and the presence of unresolved feeding difficulties. Implementation needs to be feasible, requiring protocol development that can be easily integrated into existing workflows across diverse settings. Despite very low certainty evidence, standardization benefits likely outweigh the risks. Consistent diagnosis could enable reliable clinical decisions, appropriate referrals, timely lactation support, and improved outcomes for families experiencing feeding difficulties potentially related to restrictive lingual frenum. While overdiagnosis remains an unquantified concern, the risk of procedural complications (4.0%)[11] may be reduced further with improved diagnostic consistency.

Clinical question #2. In infants, does a restrictive lingual frenum influence mother-infant outcomes related to feeding?

Recommendations. For the mother-infant dyad, a restrictive lingual frenum may be associated with maternally reported feeding difficulties and poor latch. Clinicians should consider referral for evaluation by a multidisciplinary team to support a comprehensive diagnosis of feeding difficulties (conditional in favor, very low certainty of evidence).

Summary of findings. The SR[10] included 10 studies (2005-2025) across 6 countries and demonstrated that ankyloglossia was associated with symptoms related to feeding challenges, though with very low certainty evidence. Maternally reported feeding difficulties occurred more frequently in infants with ankyloglossia compared to infants without ankyloglossia.[29] The SR[10] also presented very low certainty evidence of an association of latch issues and ankyloglossia. Anatomical and functional assessments revealed significantly lower HATLFF morphology scores (6.5 vs 9.5) and function scores (11.6 vs 13.1) in affected infants, indicating measurable structural and functional limitations.[30] Maternal outcomes included reduced breastfeeding self-efficacy scores (56.0 vs 59.6),[31] representing an important psychological dimension beyond mechanical feeding issues. Infants with ankyloglossia showed lower exclusive breastfeeding rates compared to those without ankyloglossia at 1 month (64.7% vs 74.6%) and 4 months (23.5% vs 37.1%),[32] suggesting that while mothers may persist with some breastfeeding despite difficulties, exclusive breastfeeding success is compromised. A reverse analysis examining ankyloglossia prevalence among infants with feeding difficulties yielded

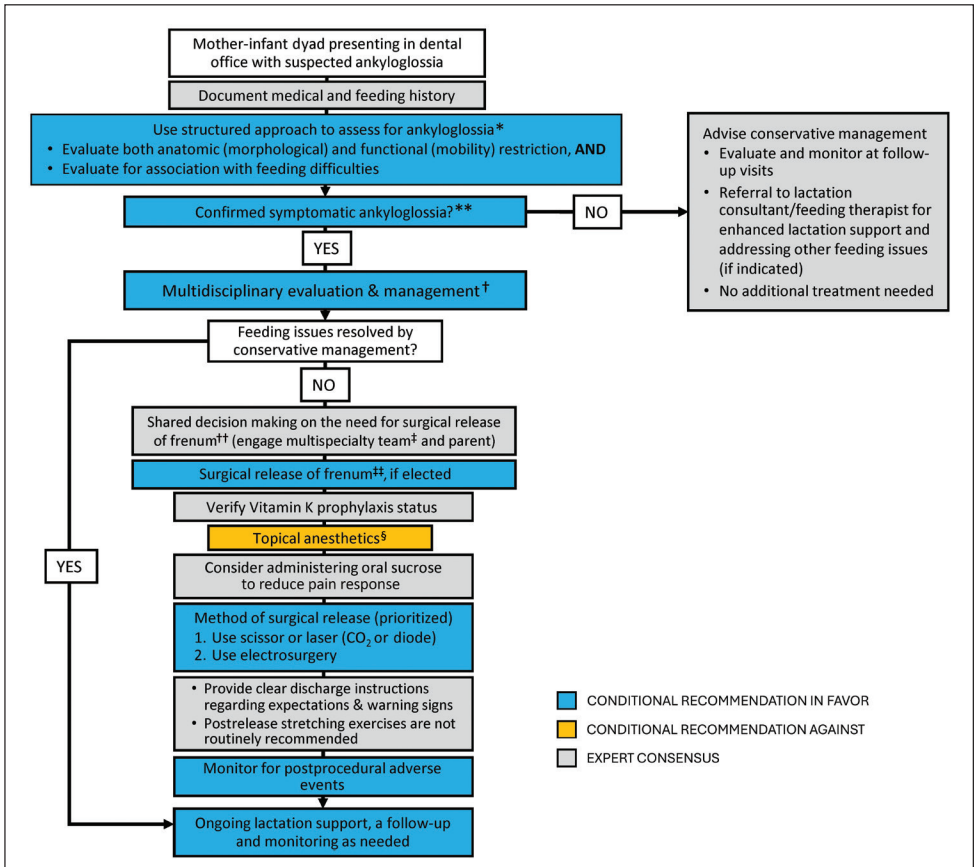


Figure 1. Evidence-based decision tree for management of infant-mother dyads presenting with ankyloglossia and feeding difficulties in the dental office.

a pooled odds ratio of 10.33 (95% CI: 0.89-120.55), while not statistically significant, suggested a bidirectional relationship between restrictive lingual frenum and feeding problems.[29,33] Studies examining posteriorly attached lingual frenum (Coryllos Class III-IV) presented conflicting data, with 1 study finding minimal differences in breastfeeding cessation rates, sore nipples, and latch issues,[27] while the other reported gradual decreases in maternal confidence and increases in maternal pain scores across Class II-IV frenum types.[28]

All outcomes received very low certainty ratings due to the predominance of single-study evidence, high risk of bias, cross-sectional designs, and substantial heterogeneity in assessment methods and populations.

Remarks. Observational studies show associations between a restrictive lingual frenum and multiple feeding outcomes, including breastfeeding difficulties and latching problems, prolonged feeding duration, nipple pain, and infant exhaustion. The pattern of associations across multiple domains may suggest potential clinical relevance beyond normal feeding variation; however, it cannot establish causality, especially given the multifactorial nature of breastfeeding difficulties. Also, except for feeding difficulties and poor latch, other outcomes are supported by limited or conflicting data.

Successful breastfeeding depends on multiple maternal, infant, and environmental factors and requires assessment that recognizes potential associations between restrictive lingual frenum and feeding difficulties within a broader feeding evaluation framework, rather than an isolated focus on tongue anatomy. Primary concerns include the risk of misclassifying normal variants or typical feeding challenges as pathological or failing to consider additional etiological or contributing factors, which could potentially lead to unnecessary interventions. The risk may be mitigated by collaborating with multidisciplinary team members adept at diagnosing feeding difficulties and implementing the protocol within existing workflows. Assessment of the lactating parent's breast, nipple, or associated regions should be performed exclusively by a physician or a lactation consultant. This guideline does not support dentists conducting comprehensive lactation examinations.

The ABM recommends a detailed clinical breastfeeding assessment, including documenting maternal history, physical examination, evidence of nipple trauma and poor breast drainage, and infant history and physical examination, with an emphasis on the detailed oral anatomic findings before treating ankyloglossia.[1]

Medical evaluation must rule out causes, including nasal obstruction, airway issues, laryngopharyngeal reflux, and craniofacial anomalies, and assess contraindications such as jaw abnormalities, neuromuscular problems, hypotonia, and coagulopathy.[8] In addition to the surgeon (pediatric dentist/dentist/oral surgeon/otolaryngologist/pediatric otolaryngologist), the team may include 1 or more of the listed providers: lactation consultants, pediatricians, breastfeeding medicine specialists, and feeding therapists. The current evidence on the association between frenum attachment type (anterior vs posterior) and feeding difficulties is insufficient; therefore, no recommendation was made regarding a posteriorly attached lingual frenum.

Clinical question #3. For infants with feeding difficulties, does the release of restrictive lingual frenum influence the mother-infant feeding outcomes compared to infants with no frenum release?

Recommendations.

- Surgical release of the lingual frenum (frenotomy/frenectomy) may be considered for carefully selected mother-infant dyads experiencing significant feeding difficulties attributed to symptomatic ankyloglossia, where symptoms persist despite comprehensive lactation support and after discussion of uncertain evidence quality and variable outcomes, and potential risks and benefits of the procedure with the family (conditional in favor, very low certainty of evidence).
- For infants with symptomatic ankyloglossia, surgical release of the lingual frenum may provide improvement in maternal self-efficacy, maternal pain, poor latch, and sucking issues, which may be sustained over time. Clinicians may consider a frenum release procedure as an adjunct to comprehensive feeding support, with realistic expectations about the potential benefits for these feeding difficulties (conditional in favor, very low certainty of evidence).
- Given the limited, conflicting, or contradictory evidence, improvement in tongue movement, feeding time, weight gain, gastric reflux issues, milk transfer, irritability, or infant exhaustion may not be considered as the primary indication for surgical release of the lingual frenum in infants with symptomatic ankyloglossia. Comprehensive feeding support should be the first line of treatment for these feeding difficulties (conditional in favor, very low certainty of evidence).

Summary of findings: Maternal self-efficacy. Single-arm studies included in the AAPD SR[11] demonstrated substantial improvements in maternal perception of feeding, with success rates progressing from 64% immediately post procedure to 73% short-term and 87% long-term. However, controlled studies showed mixed evidence, with some demonstrating a clear benefit[34,35] while others showed minimal differences between groups.[36-39] Two large cohort studies using the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) scale showed consistent improvement patterns, with Ghaheri et al. 2017[28] studying ankyloglossia (78% posterior attachment cases) noting sustained long-term improvement. The study reported relative mean improvements (RMI) of 24% to 43% for Coryllos Class I-II and 35% to 40% for Class III-IV cases at 30-day follow-up. All evidence received very low certainty ratings due to study design limitations and the risk of bias.

Latching issues. Four single-arm studies included in the SR[11] demonstrated large improvements in Latch, Audible swallowing, Type of nipple, Comfort, Hold (LATCH) scores with SMDs greater than 1.0 at both the short-term and long-term follow-up. However, 3 RCTs showed no difference between the frenotomy and control groups.[25,36,40] Eight prestudies/poststudies in the SR[11] showed substantial improvement rates, ranging from 51% to 94%, with higher success rates at longer follow-up periods, progressing from 75% short-term improvements to 82% long-term improvements. The contrast between large pre-improvements post improvements and minimal RCT differences suggests that control groups may also improve substantially over time. All evidence received very low certainty ratings.

Breastfeeding pain. Eleven single-arm studies in the SR[11] demonstrated substantial pain reduction rates, with an 86%

reduction in the short term and 64% long-term, though with notable variation. Controlled studies using validated pain scales (Short-Form McGill Pain Questionnaire [SF-MPQ], Visual Analog Scale [**VAS**], Wong-Baker FACES Pain Rating Scale) showed small pain reduction favoring frenotomy (SMD -0.35 [-0.70, 0.01]).[25,34,36,37,41] Seven preVAS/postVAS studies showed notable pain reductions across all timepoints with large SMDs.[28,40,42-46] Ghaheri et al,[28] studied posteriorly attached lingual frenum and noted 30-day relative mean improvements of 61% to 76% for Class I-II and 60% to 67% for Class III to IVcases. Pain reduction evidence received very low to low certainty ratings but demonstrated large, sustained effects over time.

Sucking issues. Three single-arm studies included in the SR[11] showed consistent improvement rates of 56.5% to 65%, with a pooled improvement of 59%. One small, controlled study favored frenotomy (5.56% vs 33.33% ongoing issues); however, the sample sizes were unbalanced.[47] Evidence was rated as having very low certainty but suggested improvement based on limited data.

Feeding time. Limited evidence from 2 studies showed progression, with 68% short-term improvement increasing to 93% long-term improvement.[48,49] However, 1 controlled study showed contradictory findings, with higher rates of lengthy breastfeeding in the frenotomy group.[38] Evidence was rated with very low certainty due to limited studies and a lack of standardized definitions.

Weight gain. Prestudies and poststudies included in the SR[11] showed variable improvement patterns, with short-term reductions in poor weight gain from baseline rates of 15.7%-23.0% to postprocedure rates of 3.3% to 13.6%. Evidence was rated as having very low certainty with inadequate data for long-term assessment.

Infant exhaustion. Only 1 study included in the SR[11] provided evidence, showing contradictory findings where controls achieved better improvement in infant exhaustion (89.9% vs 81.5%).[38] Evidence was rated as having very low certainty with inadequate data for assessment.

Milk transfer. Limited evidence from 1 study included in the SR[11] showed nearly doubled milk transfer rates from 5.6 mL/min to 10.5 mL/min (88% increase) post procedure. Another study showed similar rates of insufficient milk supply between frenotomy and control groups (16.9% vs 16.1%).[38] Evidence was rated as having very low certainty with inadequate data for assessment.

Gastroesophageal reflux. Studies using the validated Revised Infant Gastroesophageal Reflux Questionnaire (I-GERQ-R) scale included in the SR[11] showed progression from moderate short-term reduction (SMD=-0.66) to large, long-term reduction (SMD=-0.96). Ghaheri et al,[28] studying posteriorly attached lingual frena, reported 30-day relative mean improvements of 23% to 37% for Class I-II and 20% to 21% for Class III-IV cases. Other studies showed improvement rates of 44.0% to 76.7% using various methods.[50,51] Evidence was rated as having very low certainty but suggested moderate to large improvements over time.

Tongue movement. RCT evidence from the SR[11] showed large SMDs favoring frenotomy for HATLFF function scores, though it was not statistically significant due to confidence intervals crossing 0. One large study demonstrated 95% improvement in general tongue movement at the 3-month follow-up.[52] Evidence was rated as having very low certainty but favored postfrenotomy tongue movement improvements.

Irritability. Limited evidence from 1 study included in the SR[11] showed fussiness was present in 68.5% of infants at baseline, with improvement reported in 76% at short-term and 95% at long-term follow-up after frenotomy. Evidence was rated as having very low certainty but favored postfrenotomy improvements.

Remarks. There is no evidence to support prophylactic surgery to release ankyloglossia in infants in the absence of documented feeding difficulties. Evidence from multiple prefrenotomy and postfrenotomy studies shows improvements in critical outcomes, including maternal nipple pain and latch quality, alongside important outcomes such as maternal self-efficacy and sucking issues following frenotomy. At the same time, comparisons show minimal differences between the frenotomy and control groups, suggesting that control groups may also improve substantially over time through natural adaptation or other concurrent interventions. Despite very low certainty evidence, the combination of improvements in critical outcomes (pain and latch), minimal serious risks, high parental acceptability, and feasible implementation conditionally supports frenotomy in carefully selected cases.[11] However, there is a need for comprehensive feeding assessment, realistic outcome expectations, and systematic follow-up rather than routine surgical intervention, acknowledging that many feeding difficulties resolve with supportive care alone and that, while surgery may provide modest and variable benefits across individuals, it is not risk-free.

The sparse and heterogeneous evidence base undermined the confidence in outcomes such as feeding duration, infant exhaustion, weight gain, irritability, and transfer efficiency. Sample sizes were often small, outcome measures lack standardization, and the high risk of bias prevalent throughout the literature is especially problematic for these less-established outcomes. Despite evidence showing association between frenotomy and reduction in infant gastroesophageal reflux, the multifactorial etiology of reflux–including physiologic transient relaxations of the lower esophageal sphincter, frequent large-volume feedings, and supine positioning that predispose infants to regurgitation[53]–makes it difficult to isolate ankyloglossia as a primary cause or establish its surgical release (frenotomy or frenectomy) as an evidence-based treatment approach for infant gastric reflux. Unlike the critical outcomes of pain and latch difficulties, parental values regarding these functional parameters are poorly understood. Parents may prioritize immediate feeding success over measures of tongue mobility, irritability, infant reflux, or milk transfer efficiency. The uncertain clinical relevance of these outcomes makes it difficult to weigh potential benefits against the established 4.0% complication rate.[11] Given the limited evidence, inadequate weight gain alone should not drive surgical intervention; however, infants demonstrating significant weight loss or failure to thrive despite comprehensive feeding support may require expedited multidisciplinary evaluation, including consideration of frenum release. Frenum release performed primarily to improve feeding duration, infant gastric reflux, irritability, or transfer efficiency lacks sufficient evidence to justify the procedural risks and resource utilization, particularly when many feeding challenges are resolved with comprehensive lactation support alone. When present alongside established maternally reported feeding difficulties, nipple pain, and latch problems, they may provide supporting evidence for intervention.

Clinical question #4. For infants diagnosed with restrictive lingual frenum, does the method of release influence the mother-infant outcomes related to feeding?

Recommendations.

- In infants, lingual frenum release with scissors or laser may improve maternal self-efficacy and reduce nipple pain more effectively than electrosurgery. Clinicians should use their expertise, individual patient factors, and parent values and preferences in selecting the method (scissors, lasers, electrosurgery) of surgical release (conditional in favor, very low certainty of evidence).
- Considering the lack of evidence on effectiveness, absence of established safety guidelines, and potential risk of methemoglobinemia, clinicians should not use topical anesthetics prior to frenotomy or frenectomy in infants (conditional against, very low certainty of evidence).

Summary of findings. Two studies included in the SR[11] compared different release methods, with laser frenotomy showing superior improvement in maternal self-efficacy scores compared to electrosurgery (8.4-point vs 4.2-point improvement). Pain reduction analysis revealed scissors and laser methods achieving similar effectiveness (84% vs 83% pain reduction rates), while electrosurgery showed minimal benefits. VAS pain analysis demonstrated the largest reduction with scissors (SMD=-1.89, 95 percent confidence interval [**95% CI**]=-3.04, -0.74), followed by lasers (diode laser SMD=-1.02, 95% CI=-1.21, -0.84; Carbon dioxide [$\mathbf{CO_2}$] laser SMD=-0.96, 95% CI=-1.36, -0.56) and electrosurgery (SMD=-0.29, 95% CI=-0.50, -0.08). Evidence was rated very low certainty, suggesting scissors and laser frenotomy show comparable effectiveness, followed by electrosurgery.

Remarks. Evidence from limited comparative studies suggests similar outcomes between scissors and laser techniques, with both methods demonstrating superior effectiveness compared to electrocautery. Safety profiles are similar between methods. Scissors may involve more intraoperative bleeding but require no specialized training beyond basic surgical skills. CO_2 lasers are mainly absorbed by water in oral soft tissues, which leads to precise and shallow energy delivery for accurate ablation. In contrast, diode lasers are absorbed by hemoglobin and melanin, allowing them to penetrate deeper into tissue but also causing more thermal spread to surrounding areas. Although the limited current clinical studies do not show significant differences in outcomes between these laser types, the basic science behind laser-tissue interactions indicates that CO_2 lasers may provide more controlled surgery with less risk of thermal damage to nearby tissues.[54,55]

Laser and electrosurgery techniques may reduce immediate bleeding but carry risks of tissue burns with improper use and require specific equipment training and maintenance. The most significant consideration is resource allocation and accessibility, with lasers requiring capital investment and ongoing costs, while scissors are universally available and require minimal resources. The combined use of scissors with electrosurgery to achieve hemostasis is frequently used in hospital settings, providing the benefits of both methods while reducing the risk of bleeding; however, there is currently a lack of studies assessing the effectivness of this technique. Training requirements also differ substantially, with laser use requiring specialized training in equipment operation, safety protocols, and tissue effects. Clinicians should consider their clinical expertise, available resources, and the values and preferences of the patient's parent when deciding between scissors, lasers, and electrosurgery until more definitive evidence becomes available to support one method over the other.

In terms of surgical technique, the majority of studies included in the SR[11] referenced frenotomy rather than complete frenectomy, although terminology was frequently inconsistent. Two studies[28,46] describing a "complete release" involving diamond-shaped wounds created with lasers or electrosurgery, however, referred to these procedures as "frenotomy." Consequently, the WG was unable to assess the impact of the type of procedure (frenotomy vs frenectomy) on feeding difficulties. Clinicians are encouraged to exercise clinical judgement in determining whether a simple incision (frenotomy) or a complete excision (frenectomy) is indicated on an individual basis, bearing in mind that only 1 Current Dental Terminology (**CDT**) code currently exists for the procedure, D7962–Lingual frenectomy.

Ovental et al.[56] assessed the analgesic effects of topical benzocaine applied prior to lingual frenotomy in infants and found no significant difference in the average duration of crying (<1 minute) between the benzocaine and control groups. The US Food and Drug Administration[57] advises against the use of topical products containing benzocaine for children younger than 2 years old, citing minimal benefit for treating oral pain and a rare but serious risk of methemoglobinemia, but serious risk of methemoglobinemia. Although even more rarely, prilocaine-lidocaine cream has also been reported to be associated with methemoglobinemia.[58] Therefore, the risk-benefit assessment favors a conditional recommendation against its use in infants. The use of oral sucrose was not evaluated in the SRs informing this guideline. However, clinicians may consider administering oral sucrose before frenotomy, consistent with the 2020 AAO-HNS[7] clinical consensus statement, indicating that sucrose reduces pain responses in infants during procedures.

Clinical question #5. For infants who have undergone frenum release, does postprocedure care influence the mother-infant outcomes related to feeding?

Recommendations.

- For infants who have undergone frenotomy or frenectomy to release symptomatic ankyloglossia, ongoing lactation support for the mother–infant dyad should be maintained, with regular follow-up assessments to monitor wound healing and evaluate resolution of feeding difficulties (conditional in favor, very low certainty of evidence).
- Limited evidence suggests low adherence to postprocedure protocols among mother–infant dyads. Partial compliance with postrelease stretching exercises has been associated with potential adverse outcomes, including recurrence, scarring, and bleeding. Given the limited evidence on benefit and potential for harm, postrelease stretching exercises may not be routinely recommended. If considered, the decision should be made through shared decision making, incorporating clinical expertise, individual patient factors, and parent values and preferences, with clear counseling on potential benefits and harms (expert consensus).

Summary of findings. Most studies included in the SR[11] that evaluated frenotomy employed follow-up strategies to evaluate and monitor postprocedure resolution of feeding difficulties. However, the evidence on the effectiveness of postprocedure care was poorly reported in the literature and was rated to be of very low certainty because of indirectness, study designs, and the risk of bias. Two studies included in the SR[11] examined post

frenotomy stretching exercises but found significant compliance challenges, with adherence rates of only 43.5% to 57.1%. Among compliant patients, outcomes showed some promise: 100% resolution of feeding difficulties in the stretching groups vs 84% in nonstretching groups, and lower unfavorable scarring rates (11.1% vs 28.0%).[59] However, breastfeeding continuation rates showed only marginal improvement with massage (96.7% vs 92.2%),[60] and recurrence rates yielded mixed results across studies.[59,60]

Notably, non-adherent patients performed worse than those receiving no intervention at all, suggesting potential harm from incomplete stretching protocols. This finding, combined with consistently low compliance rates and unclear mechanisms for why partial adherence worsens outcomes, indicates limited evidence to support routine postfrenotomy massage.[59]

Postprocedure stretching carries potential risks, including wound dehiscence, delayed healing, bleeding, and infection. While one study reported increased bleeding risk,[61] another study found no adverse events when parents were directly questioned about complications.[60] The evidence was rated as having very low certainty due to compliance issues and study design limitations.

Remarks. Given the limited evidence, the WG was unable to formulate a formal evidence-based recommendation on post release stretching exercises following the surgical release of the frenum. Current evidence supports focusing postprocedure care on comprehensive feeding assessment and lactation support; however, the postfrenotomy stretching exercises lack clear additional benefit and may cause potential harm related to scarring and oral aversion. The low compliance rates suggest parents may find exercise regimens burdensome or distressing. One study showed that partially adherent patients had worse outcomes than either adherent or nonstretching groups.[59] This suggests that partial or inconsistent stretching exercise performance may be more harmful than no exercise at all. Additionally, stretching significantly increased bleeding risk (26.7% vs typical 2.0% to 5.0% rates),[61] raising safety concerns about routine implementation.

Clinical question #6. What are the adverse events reported in the mother-infant dyad associated with frenum release in infants?

Recommendations. Adverse events associated with frenum release in infants, although uncommon, may include bleeding, ulceration, scarring, swelling, and irritability. Clinicians should implement adverse event monitoring and facilitate shared decision making, which includes family counseling focused on bleeding precautions and expected patterns of healing (conditional in favor, very low certainty of evidence).

Summary of findings. Eight studies included in the SR,[11] encompassing 1,203 infants, reported a pooled adverse event rate of 4.0% (48 per 1,203 cases). Bleeding complications dominated adverse events, reported in 6 studies, with a rate of 1.8% in one high-quality RCT.[25] Postprocedure stretching exercises significantly increased bleeding risk (26.7% vs typical 2% to 5% rates).[61] Healing complications, including ulcers (33% of adverse events), scar tissue formation (38%), and irritability (19%), were reported.[39] Structural damage, including salivary duct injury, occurred in only 2 cases, and revision procedures were needed in 1.8% of cases.[39,62] Notably, no life-threatening complications, permanent disabilities, or hospital readmissions requiring extended care were reported across any study. Although this indicates a potentially positive safety profile, true complication rates may be underestimated due to systematic underreporting and the absence of standard adverse event monitoring protocols across the various disciplines conducting these procedures. Evidence was rated as having very low certainty due to study design limitations and the absence of validated outcome measures for adverse event reporting.

Remarks. The 4.0% pooled adverse event rate from 1,203 procedures across 8 studies suggests that frenotomy is a low-risk procedure.[11] The adverse event profile is dominated by bleeding complications. Vitamin K deficiency bleeding (**VKDB**) may present as early onset (within the first 24 hours of life), classic onset (between days 2 and 7), or late onset (between day 8 and 6 months of age). Although VKDB risk is generally low, administering vitamin K before the procedure can help reduce bleeding risk. Prior to performing a frenum release, clinicians should verify administration of vitamin K prophylaxis and ensure that parents are informed that infants who have not received vitamin K may be at an increased bleeding risk.[63] Clinicians should engage in shared decision making with parents regarding the benefits and harms of proceeding with the procedure in the absence of vitamin K prophylaxis. Another critical finding is that postprocedure stretching exercises significantly increase bleeding risk to 26.7% compared to typical rates of 2.0% to 5.0%.[61] Currently, the AAP[9] does not recommend postoperative stretching exercises, given the limited evidence on benefits and potential risk of oral aversion. The SRs that informed the current guideline, unfortunately, did not find any studies on oral aversion that met the inclusion criteria. Importantly, the evidence reveals important gaps in adverse event monitoring and reporting, as most studies lack standardized adverse event definitions, systematic monitoring protocols, or adequate follow-up duration to capture delayed complications.

Implications for practice

The evidence supports several critical implications for clinical decision making that align with the evidence-based recommendations presented in this guideline. Clinicians should utilize structured diagnostic approaches that combine both anatomical (morphological) and functional assessments when evaluating mother-infant dyads presenting with feeding difficulties related to suspected ankyloglossia, with an emphasis on functional impact on feeding outcomes rather than anatomical appearance alone.

The BTAT/TABBY, with a diagnostic threshold of 5 or less, demonstrates favorable psychometric properties, including acceptable internal consistency (Cronbach's α=0.708) and strong correlation with HATLFF (r=0.89), though all assessment tools received very low certainty evidence ratings.[10] Infants may be diagnosed with symptomatic/restrictive lingual frenum only when a thorough assessment reveals signs of both anatomic and functional impairment of the tongue associated with feeding difficulties.

A multidisciplinary team approach is essential for the comprehensive diagnosis of feeding difficulties, as recommended in this guideline. The evidence demonstrates that restrictive lingual frenum may be associated with feeding difficulties and a reduction in maternal self-efficacy, supporting the need for collaborative evaluation rather than isolated surgical decision.[11] Caloway et al. demonstrated that 62.6% of infants referred for frenotomy did not require surgery following a comprehensive multidisciplinary feeding evaluation.[2]

When surgical release is considered, frenotomy may be offered to carefully selected mother-infant dyads experiencing significant feeding difficulties attributed to restrictive lingual frenum, following comprehensive lactation support and after discussion of uncertain evidence quality and variable outcomes. The evidence supports moderate to large improvements in maternal self-efficacy, maternal pain, poor latch, and sucking issues, with these improvements sustained over time.[11]

Regarding surgical technique, scissors, lasers, or electrosurgery may be used with a similar safety profile. Limited comparative evidence suggests that the use of scissors and CO_2 lasers is associated with superior outcomes for pain reduction and maternal self-efficacy.[11] Clinicians should not use topical anesthetics prior to frenotomy due to a lack of evidence on effectiveness, safety guidelines, and the potential risk of methemoglobinemia.

Postprocedure care should focus on maintaining ongoing lactation support with regular follow-up assessments to monitor wound healing and evaluate resolution of feeding difficulties. The evidence indicates that postfrenotomy stretching exercises have low compliance rates (43.5% to 57.1%) and the potential for negative outcomes with partial adherence.[11]

Adverse event monitoring and shared decision making should be implemented, including family counseling focused on bleeding precautions and expected patterns of healing. While adverse events are uncommon (pooled rate=4.0%), they may include bleeding, ulceration, scarring, swelling, and irritability.[11] Clinicians should be prepared to manage potential complications and have established emergency management protocols in place. Postprocedure bleeding is typically minor and self-limiting; applying direct pressure with gauze is the standard initial treatment.[63,64] Signs that warrant urgent medical evaluation include persistent bleeding unresponsive to pressure, respiratory distress, excessive swelling, or difficulty feeding. Caregivers should receive clear discharge instructions outlining expected healing patterns and warning signs.[7]

All clinical decisions should emphasize that the current evidence remains of very low certainty, requiring individualized assessment and comprehensive informed consent regarding the uncertain evidence quality and variable outcomes.

Implications for research

Research priorities should focus on addressing the significant evidence gaps identified in this clinical practice guideline to strengthen future guideline recommendations. The development and validation of standardized diagnostic criteria that reliably combine both anatomical and functional assessments represents the most critical need, particularly given the current reliance on very low certainty evidence for all diagnostic tools.[19,22,42]

Clinicians and researchers should note that prestudies and poststudies without control groups may overstate treatment benefits, as improvements can result from various nontreatment factors and be part of the natural history of untreated symptomatic ankyloglossia. At the same time, adverse effects are often underreported due to limited monitoring and short follow-up periods. This imbalance in evidence may favor interventions and minimize potential harm, which is important to remember when advising families. High-quality randomized controlled trials with adequate sample sizes are needed to move beyond the current predominance of observational studies. Future trials should address the specific clinical questions outlined in this guideline, including comparative effectiveness of different surgical techniques, appropriate use of terminology specific to the extent of release (frenotomy or simple incision vs frenectomy or complete excision), optimal timing of intervention, and long-term outcomes of both treated and untreated cases. The contrast between large preimprovements and postimprovements and minimal RCT differences suggests that control groups also improve substantially over time, highlighting the need for appropriate control group design.[25,36,40]

Research into the association between frenum attachment type (anterior vs posterior) and feeding difficulties is needed, as the current evidence was insufficient to formulate recommendations on the posteriorly-attached lingual frenum.[10] This represents a significant clinical gap related to the diagnosis and treatment of posteriorly-attached lingual frenum. Standardized adverse event reporting and monitoring systems must be developed to provide more reliable safety data beyond the current 4.0% pooled rate, which likely represents underreporting due to a lack of standardized protocols across disciplines performing these procedures.[11]

Other areas of research interest include the investigation of postprocedure care protocols, particularly regarding stretching exercises, reasons behind worsened outcomes related to partial adherence, and the development of evidence-based postoperative management strategies that are both effective and achievable in clinical practice.[11] Additionally, long-term follow-up studies are needed to inform the broader impact of both intervention and non-intervention decisions. Research should also focus on developing decision-making algorithms that can reliably identify which mother-infant dyads are most likely to benefit from surgical intervention vs conservative management.[64,65] Given the increasing global rates of ankyloglossia diagnosis and frenotomy procedures, understanding the factors driving these trends and establishing evidence-based criteria for appropriate patient selection represents a critical public health research priority to ensure optimal resource utilization and patient outcomes.[66,67]

All studies informing this guideline were conducted on cisgender mother-infant breastfeeding dyads. Future research should include diverse lactating individuals, including transgender persons, nonbinary individuals, and nonbirthing caregivers, to determine the generalizability of findings on feeding outcomes, self-efficacy, and pain reduction. Validation of outcome instruments in these populations is also needed.

Cost effectiveness

Cost-effectiveness for therapies with proven health benefits and minimal adverse effects is an important consideration for clinicians, patients, and third-party payors. Office-based frenotomy demonstrates substantial cost savings compared to operating room procedures under general anesthesia. One study reported surgical fees of approximately $850 for office-based frenotomy vs $4,300 to $6,700 for operating room procedures.[68]

However, a randomized controlled trial examining cost-effectiveness within the UK's National Health Service found no significant differences in health care resource use, costs, or benefits between frenotomy and breastfeeding support alone. The study noted substantial uncertainty in determining value for money due to small sample size and high crossover rates, indicating that current evidence is insufficient to conclude frenotomy offers cost-effective benefits over comprehensive lactation support alone.[39]

Current Medicaid coverage for CDT code D7962 (lingual frenectomy) varies significantly by state and individual plans, with coverage requirements often including detailed documentation of medical necessity and preauthorization. Private insurance coverage is inconsistent, with studies showing only 19% to 23%

of procedures covered by private insurance and 51% to 69% requiring a highly variable out-of-pocket cost. Patients with multiple oral tie diagnoses typically incur higher treatment costs.[66] Considering these challenges, it may be beneficial to establish a distinct CDT code for infant lingual frenotomy, which involves a simple incision to release the frenum, without removing tissue. This new code may be suggested to the American Dental Association (**ADA**) Code Maintenance Committee, as it would differentiate this simpler procedure from more involved treatments such as frenectomy (D7962–complete tissue removal) and frenuloplasty (D7963–a complex procedure involving frenum excision with muscle repositioning and flap closure). Such differentiation could enhance reimbursement options for simpler procedures. Additionally, as infants are more likely to have medical rather than dental insurance coverage, dentists may have to submit frenum release procedures using specific Current Procedural Terminology (CPT) codes to medical insurance or refer to providers who can, while ensuring families understand their payment options.

Available evidence indicates generally high satisfaction rates with frenotomy procedures. Studies report 84% to 92% of parents being satisfied or very satisfied with their decision to pursue treatment, regardless of whether performed in office or operating room settings.[65,68] Satisfaction appears related to perceived feeding improvements rather than surgical setting, with 84% of families reporting immediate postprocedure improvement within 1 day to 2 weeks.[65]

Workgroup, stakeholders, review, and quality assurance

In February 2023, the AAPD Board of Trustees approved a panel nominated by the Evidence-Based Dentistry Committee to develop a new evidence-based clinical practice guideline on management of ankyloglossia and breastfeeding difficulties of infants in the dental office. The WG consisted of pediatric dentists, pediatricians, and pediatric otolaryngologists who are involved in research, education, and clinical practice across a variety of settings, including private practice.

The recommendations were circulated for feedback from internal stakeholders, including members of the AAPD Council on Clinical Affairs, AAPD Council on Scientific Affairs, AAPD Council on Post-Doctoral Education, AAPD Research and Policy Center, and the AAPD Evidence-Based Dentistry Committee, as well as the external stakeholders, such as the ADA, American Dental Education Association (ADEA), International Association of Paediatric Dentistry (IAPD), American Association for Dental, Oral, and Craniofacial Research (AADOCR), AAP Section on Oral Health, AAP Section on Breastfeeding, AAP Section on Otolaryngology-Head and Neck Surgery, AAO-HNS, ABM, United States Lactation Consultant Association (USLCA), and the International Lactation Consultant Association (ILCA). Revisions were made by the WG based on the feedback received, and the final version of the recommendations was produced. This clinical practice guideline adhered to the AGREE II[15] instrument to ensure methodological quality of the reported guideline.

Target population(s), end users, and settings

This guideline is intended primarily for pediatric dentists managing infants with ankyloglossia in a dental setting. Other clinicians treating infants, policymakers, and parents may also benefit from this document.

Guideline implementation

This first AAPD evidence-based guideline on management of ankyloglossia and lactation of infant patients in the dental office is published in both the journal *Pediatric Dentistry* and *The Reference Manual of Pediatric Dentistry*. Additionally, AAPD members will be notified of the new guideline via social media, newsletters, and presentations. The guideline is available as an open-access publication on the AAPD's website. Guidelines are used by insurers, patients, and health care practitioners to determine the quality of care. Adherence to guideline recommendations and best practices is likely to reduce inappropriate care and improve outcomes.

Guideline updating process

The AAPD's Evidence-Based Dentistry Committee will monitor the research to identify new evidence that may impact the current recommendations. These recommendations will be updated five years from the time of the last systematic search unless the Evidence-Based Dentistry Committee determines an earlier revision or update is warranted.

References

1. LeFort Y, Evans A, Livingstone V, et al. Academy of Breastfeeding Medicine position statement on ankyloglossia in breastfeeding dyads. *Breastfeed Med*. 2021;16(4):278-281. DOI: 10.1089/bfm.2021.29179.ylf
2. Caloway C, Hersh CJ, Baars R, Sally S, Diercks G, Hartnick CJ. Association of feeding evaluation with frenotomy rates in infants with breastfeeding difficulties. *JAMA Otolaryngol Head Neck Surg*. 2019;145(9):817-822. DOI: 10.1001/jamaoto.2019.1696
3. Raol N, Silamkoti B, Syed SM, Hosek K, Theetla P, Madireddy A. Ankyloglossia, breastfeeding, and infant weight gain: A mixed-methods study. *Pediatrics*. 2026;157(1):e2024070531. DOI: 10.1542/peds.2024-070531
4. Flagg J, Busch DW. Utilizing a risk factor approach to identify potential breastfeeding problems. *Glob Pediatr Health.* 2019;6:2333794X19847923. DOI: 10.1177/2333794X19847923
5. American Academy of Pediatric Dentistry. Policy on management of the frenulum in pediatric patients. The Reference Manual of Pediatric Dentistry. American Academy of Pediatric Dentistry; 2025:80-85.
6. Mills N, Pransky SM, Geddes DT, Mirjalili SA. What is a tongue tie? Defining the anatomy of the in-situ lingual frenulum. *Clin Anat.* 2019;32(6):749-761. DOI: 10.1002/ca.23343
7. Messner AH, Walsh J, Rosenfeld RM, et al. Clinical consensus statement: Ankyloglossia in children. *Otolaryngol Head Neck Surg.* 2020;162(5):597-611. DOI: 10.1177/0194599820915457
8. 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. DOI: 10.1001/archotol.126.1.36
9. Thomas J, Bunik M, Holmes A, et al. Identification and management of ankyloglossia and its effect on breastfeeding in infants: Clinical report. *Pediatrics*. 2024;154(2):e2024067605. DOI: 10.1542/peds.2024-067605
10. Dhar V, Marghalani A, Amini H, et al. Diagnostic assessment of ankyloglossia and the association with infant feeding challenges: A systematic review and meta-analysis–Part 1. *Pediatr Dent.* 2026;48(2):82-94.E8-E32.

11. Dhar V, Marghalani A, Amini H, et al. Frenotomy for ankyloglossia associated with feeding challenges in infants: Effectiveness, technique, and safety–A systematic review and meta-analysis: Part 2. *Pediatr Dent.* 2026;48(2): E33-E68.
12. Schünemann H BeJ GG, Oxman A. Quality of evidence. In: Schünemann H, Brożek J, Guyatt G, Oxman A, eds. *GRADE Handbook: Handbook for Grading the Quality of Evidence and the Strength of Recommendations Using the GRADE Approach*. GRADE Working Group; Updated October 2013.
13. Santesso N, Glenton C, Dahm P, et al. GRADE guidelines 26: Informative statements to communicate the findings of systematic reviews of interventions. *J Clin Epidemiol*. 2020;119:126-135. DOI: 10.1016/j.jclinepi.2019.10.014
14. 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. DOI: 10.1177/0194599820925415
15. Brouwers MC, Kho ME, Browman GP, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. *CMAJ*. 2010;182(18):E839-E842. DOI: 10.1503/cmaj.090449
16. Andrews J, Guyatt G, Oxman AD, et al. GRADE guidelines: 14. Going from evidence to recommendations: The significance and presentation of recommendations. *J Clin Epidemiol*. 2013;66(7):719-725. DOI: 10.1016/j.jclinepi.2012.03.013
17. American Academy of Pediatric Dentistry. Overview. *The Reference Manual of Pediatric Dentistry*. American Academy of Pediatric Dentistry; 2025:7-9.
18. Fraga MDRBA, Barreto KA, Lira TCB, Menezes VA. Diagnosis of ankyloglossia in newborns: Is there any difference related to the screening method? *Codas*. 2021;33(1): e20190209. DOI: 10.1590/2317-1782/20202019209
19. Ingram J, Copeland M, Johnson D, Emond A. The development and evaluation of a picture tongue assessment tool for tongue-tie in breastfed babies (TABBY). *Int Breastfeed J*. 2019;14:31. DOI: 10.1186/s13006-019-0224-y
20. Ingram J, Johnson D, Copeland M, Churchill C, Taylor H. The development of a new breast feeding assessment tool and the relationship with breast feeding self-efficacy. *Midwifery*. 2015;31(1):132-137. DOI: 10.1016/j.midw.2014.07.001
21. Queiroz IQD, Leal SC, Alves WNS, et al. Comparison between two protocols for ankyloglossia diagnosis in newborn babies. *Pediatr Dent.* 2022;44(1):52-57.
22. Brandão CA, de Marsillac MWS, Barja-Fidalgo F, Oliveira BH. Is the Neonatal Tongue Screening Test a valid and reliable tool for detecting ankyloglossia in newborns? *Int J Paediatr Dent*. 2018;28(4):380-389. DOI: 10.1111/ipd.12369
23. Madlon-Kay DJ, Ricke LA, Baker NJ, DeFor TA. Case series of 148 tongue-tied newborn babies evaluated with the assessment tool for lingual frenulum function. *Midwifery*. 2008;24(3):353-357. DOI: 10.1016/j.midw.2006.02.005
24. Ricke LA, Baker NJ, Madlon-Kay DJ, DeFor TA. Newborn tongue-tie: Prevalence and effect on breast-feeding. *J Am Board Fam Pract*. 2005;18(1):1-7. DOI: 10.3122/jabfm.18.1.1
25. Dinh LA, El-Rabbany M, Aslam S, Ricalde P. Does lingual frenotomy improve breastfeeding in newborns with ankyloglossia? A randomized controlled trial. *J Oral Maxillofac Surg*. 2025;83(7):806-812. DOI: 10.1016/j.joms.2025.04.006
26. Katz RV, Dearing BA, Ryan JM, Ryan LK, Zubi MK, Sokhal GK. Development of a tongue-tie case definition in newborns using a Delphi survey: The NYU-Tongue-Tie Case Definition. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2020;129(1):21-26. DOI: 10.1016/j.oooo.2019.01.012
27. Haham A, Marom R, Mangel L, Botzer E, Dollberg S. Prevalence of breastfeeding difficulties in newborns with a lingual frenulum: A prospective cohort series. *Breastfeed Med*. 2014;9(9):438-441. DOI: 10.1089/bfm.2014.0040
28. Ghaheri BA, Cole M, Fausel SC, Chuop M, Mace JC. Breastfeeding improvement following tongue-tie and lip-tie release: A prospective cohort study. *Laryngoscope.* 2017; 127(5):1217-1223. DOI: 10.1002/lary.26306
29. Campanha SMA, Martinelli RLC, Palhares DB. Association between ankyloglossia and breastfeeding. *Codas.* 2019;31(1):e20170264. DOI: 10.1590/2317-1782/20182018264
30. Schlatter SM, Schupp W, Otten JE, et al. The role of tongue-tie in breastfeeding problems: A prospective observational study. *Acta Paediatr*. 2019;108(12):2214-2221. DOI: 10.1111/apa.14924
31. Feldens CA, Foláyan MO, de Amorim LM, de Barros Coelho EMR, Kern Dos Santos GF, Kramer PF. Ankyloglossia and breastfeeding self-efficacy in newborns: A birth cohort study. *BMC Oral Health*. 2025;25(1):64. DOI: 10.1186/s12903-025-05444-1
32. Feldens CA, Heck ABDS, Rodrigues PH, Coelho EMRB, Vítolo MR, Kramer PF. Ankyloglossia and breastfeeding duration: A multicenter birth cohort study. *Breastfeed Med*. 2024;19(1):17-25. DOI: 10.1089/bfm.2023.0182
33. Ngerncham S, Laohapensang M, Wongvisutdhi T, et al. Lingual frenulum and effect on breastfeeding in Thai newborn infants. *Paediatr Int Child Health*. 2013;33(2):86-90. DOI: 10.1179/2046905512Y.0000000023
34. Berry J, Griffiths M, Westcott C. A double-blind, randomized, controlled trial of tongue-tie division and its immediate effect on breastfeeding. *Breastfeed Med*. 2012;7(3): 189-193. DOI: 10.1089/bfm.2011.0030
35. 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. DOI: 10.1111/j.1440-1754.2005.00604.x
36. Emond A, Ingram J, Johnson D, et al. Randomised controlled trial of early frenotomy in breastfed infants with mild-moderate tongue-tie. *Arch Dis Child Fetal Neonatal Ed*. 2014;99(3):F189-F195. DOI: 10.1136/archdischild-2013-305031
37. Ghaheri BA, Lincoln D, Mai TNT, Mace JC. Objective improvement after frenotomy for posterior tongue-tie: A prospective randomized trial. *Otolaryngol Head Neck Surg*. 2022;166(5):976-984. DOI: 10.1177/01945998211039784
38. Riskin A, Mansovsky M, Coler-Botzer T, et al. Tongue-tie and breastfeeding in newborns: Mothers' perspective. *Breast-feed Med*. 2014;9(9):430-437. DOI: 10.1089/bfm.2014.0072
39. Knight M, Ramakrishnan R, Ratushnyak S, et al. Frenotomy with breastfeeding support versus breastfeeding support alone for infants with tongue-tie and breastfeeding difficulties: The FROSTTIE RCT. *Health Technol Assess*. 2023;27(11):1-73. DOI: 10.3310/WBBW2302

40. Dollberg S, Botzer E, Grunis E, Mimouni FB. Immediate nipple pain relief after frenotomy in breast-fed infants with ankyloglossia: A randomized, prospective study. *J Pediatr Surg*. 2006;41(9):1598-1600. DOI: 10.1016/j.jpedsurg.2006.05.024
41. Buryk M, Bloom D, Shope T. Efficacy of neonatal release of ankyloglossia: A randomized trial. *Pediatrics*. 2011;128(2):280-288. DOI: 10.1542/peds.2011-0077
42. Ballard JL, Auer CE, Khoury JC. Ankyloglossia: Assessment, incidence, and effect of frenuloplasty on the breastfeeding dyad. *Pediatrics*. 2002;110(5):e63. DOI: 10.1542/peds.110.5.e63
43. Dell'Olio F, Baldassarre ME, Russo FG, et al. Lingual laser frenotomy in newborns with ankyloglossia: A prospective cohort study. *Italian J Pediatr*. 2022;48(1):163. DOI: 10.1186/s13052-022-01357-9
44. Cannon A, Perrella S, Whan E, Rea A, Murray, K, Geddes D. Effectiveness of milk transfer does not improve in breastfed tongue-tied infants following frenotomy. *Breastfeed Med*. 2018;13(7):A44-A45. https://www.researchgate.net/publication/328601759_EFFECTIVENESS_OF_MILK_TRANSFER_DOES_NOT_IMPROVE_IN_BREASTFED_TONGUE-TIED_INFANTS_FOLLOWING_FRENOTOMY
45. Muldoon K, Gallagher L, McGuinness D, Smith V. Effect of frenotomy on breastfeeding variables in infants with ankyloglossia (tongue-tie): A prospective before and after cohort study. *BMC Pregnancy Childbirth*. 2017;17(1):373. DOI: 10.1186/s12884-017-1561-8
46. Slagter KW, Raghoebar GM, Hamming I, Meijer J, Vissink A. Effect of frenotomy on breastfeeding and reflux: Results from the BRIEF prospective longitudinal cohort study. *Clin Oral Investig*. 2021;25(6):3431-3439. DOI: 10.1007/s00784-020-03665-y
47. Chi-Oi Lam C, Wong SK, Chi-Ying Wong F. Effect of frenotomy for tongue-tie on improving breastfeeding. *Hong Kong J Gynaecol Obstet Midwifery*. 2020;20(2):69-74. DOI: https://doi.org/10.12809/hkjgom.20.2.02
48. Braccio S, Chadderton Z, Sherridan A, Upadhyaya M. Tongue-tie division. Is it worth it? A retrospective cohort study. *Br J Midwifery*. 2016;24(5):317-321. DOI:10.12968/bjom.2016.24.5.317
49. Wen Z, Walner DL, Popova Y, Walner EG. Tongue-tie and breastfeeding. *Int J Pediatr Otorhinolaryngol*. 2022;160:111242. DOI: 10.1016/j.ijporl.2022.111242
50. Hill RR, Pados BF. Gastrointestinal symptom improvement for infants following tongue-tie correction. *Clin Pediatr (Phila)*. 2023;62(2):136-142. DOI: 10.1177/00099228221117459
51. Lima ALX, Dutra MRP. Influence of frenotomy on breastfeeding in newborns with ankyloglossia. *Codas*. 2021;33(1):e20190026. DOI: 10.1590/2317-1782/20202019026
52. Griffiths DM. Do tongue ties affect breastfeeding? *J Hum Lact* 2004;20(4):409-14. DOI: 10.1177/0890334404266976
53. Lightdale JR, Gremse DA; Section on Gastroenterology, Hepatology, and Nutrition. Gastroesophageal reflux: Management guidance for the pediatrician. *Pediatrics*. 2013;131(5):e1684-e1695. DOI: 10.1542/peds.2013-0421
54. Parker S, Cronshaw M, Anagnostaki E, Mylona V, Lynch E, Grootveld M. Current concepts of laser-oral tissue interaction. *Dent J (Basel)*. 2020;8(3):61. DOI: 10.3390/dj8030061
55. Tenore G, Mohsen A, Nuvoli A, et al. The impact of laser thermal effect on histological evaluation of oral soft tissue biopsy: Systematic review. *Dent J (Basel)*. 2023;11(2):28. DOI: 10.3390/dj11020028
56. Ovental A, Marom R, Botzer E, Batscha N, Dollberg S. Using topical benzocaine before lingual frenotomy did not reduce crying and should be discouraged. *Acta Paediatr*. 2014;103(7):780-782. DOI: 10.1111/apa.12654
57. US Food and Drug Administration. Safely soothing teething pain in infants and children. Content current as of June 26, 2024. Accessed July 14, 2026. https://www.fda.gov/consumers/consumer-updates/safely-soothing-teething-pain-infants-and-children
58. Jakobson B, Nilsson A. Methemoglobinemia associated with a prilocaine-lidocaine cream and trimetoprim-sulphamethoxazole. A case report. *Acta Anaesthesiol Scand*. 1985;29(4):453-5.
59. Miller JE, Chung HR, Marshall CR, Wilhalme HM, West AN. Outcomes of stretching exercises after lingual frenotomy in infants: A prospective, interventional study. *Int J Pediatr Otorhinolaryngol*. 2025;191:112280. DOI: 10.1016/j.ijporl.2025.112280
60. Bhandarkar KP, Dar T, Karia L, Upadhyaya M. Post frenotomy massage for ankyloglossia in infants: Does it improve breastfeeding and reduce recurrence? *Matern Child Health J*. 2022;26(8):1727-1731. DOI: 10.1007/s10995-022-03454-x
61. Srinivasan A, Al Khoury A, Puzhko S, et al. Frenotomy in infants with tongue-tie and breastfeeding problems. *J Hum Lact*. 2019;35(4):706-712. DOI: 10.1177/0890334418816973
62. Towfighi P, Johng SY, Lally MM, Harley EH. A retrospective cohort study of the impact of upper lip tie release on breastfeeding in infants. *Breastfeed Med*. 2022;17(5):446-452. DOI: 10.1089/bfm.2021.0140
63. Griffiths M, Oakley S, Hall N, Ganesan K National Guidelines for Prolonged Bleeding Management. Association of Tongue-tie Practitioners. 2020. Accessed January 2, 2026. https://www.tongue-tie.org.uk/bleeding-guidelines
64. O'Shea JE, Foster JP, O'Donnell CP, et al. Frenotomy for tongue-tie in newborn infants. *Cochrane Database Syst Rev*. 2017;3:CD011065. DOI: 10.1002/14651858.CD011065.pub2
65. Klockars T, Pitkäranta A. Pediatric tongue-tie division: Indications, techniques and patient satisfaction. *Int J Pediatr Otorhinolaryngol*. 2009;73(10):1399-1401. DOI: 10.1016/j.ijporl.2009.07.004
66. Bhatt A, Turner B, Davidson J, et al. Incidence of oral tie diagnosis and treatment in Southwestern Ontario: A survey study. *Int J Pediatr Otorhinolaryngol*. 2025;192:112306. DOI: 10.1016/j.ijporl.2025.112306
67. Walsh J, Links A, Boss E, Tunkel D. Ankyloglossia and lingual frenotomy: National trends in inpatient diagnosis and management in the United States, 1997-2012. *Otolaryngol Head Neck Surg*. 2017;156(4):735-740. DOI: 10.1177/0194599817690135
68. Toner D, Giordano T, Handler SD. Office frenotomy for neonates: resolving dysphagia, parental satisfaction and cost-effectiveness. *ORL Head Neck Nurs*. 2014;32(2):6-7.