

Tongue-tie Expert Roundtable

First published: Special Edition

Clinical Lactation. 2017;8(3):87-131

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Updated 27 June 2019

What is the approximate incidence of tongue-tie? In your opinion, is incidence increasing?

From the 1950s, classic (or anterior) tongue-tie (CTT) was often overlooked as a cause of breastfeeding problems. In a literature review in 2005, Hall and Renfrew acknowledged that the true prevalence of ankyloglossia remained unknown, though they estimated 3-4% of newborns.¹

After 2005, once the diagnosis of 'posterior tongue-tie' (PTT) had been introduced,^{2,3} attempts to quantify incidence have remained of very poor quality, but estimates currently rest at between 4-10%.⁴

The problem is that there is a lack of definitional clarity concerning the diagnosis of PTT, and CTT is now often conflated with PTT, as simply 'tongue-tie' (TT). Between 2004 and 2013, the incidence of TT diagnosis in Canada increased by 70%; the rate of frenotomy increased by 90%.⁵ In Australia, emerging epidemiological data shows an exponential rise in the

incidence of Medicare-funded frenotomies 2006-2016, of on average 420% and of up to 3710%, and this data does not consider laser surgery by dentists, who perhaps perform a majority of frenotomies.⁵⁻⁷

Fortunately, CTTs are now much less likely to be overlooked! But this kind of pattern is recognised by epidemiologists as typical of over-treatment.

The absence of baseline data telling us about the normal spectrum of newborn oral connective tissue variation underscores how matters related to clinical breastfeeding support are still not a health system or research priority. In fact, I'd argue that this lack of investment is the actual story that underlies the oral ties controversy.

How should tongue-tie be identified? Which professional groups should be doing it?

What are the classifications of tongue-tie?

Current definitions of ankyloglossia tend to confuse oral and tongue function (which is affected by multiple variables, and in particular by fit and hold) with structure (which is highly anatomically variable for both the tongue length and appearance, and lingual and maxillary frenula).

Identification of classic tongue-tie

Here, I define CTT as Type 1 and 2 on the Coryllos-Genna-Watson scale.⁸ In clinical practice I also find it useful to rate the anterior membrane by the percentage of the under-surface of the tongue into which the membrane connects, applying the first two categories of the Griffiths Classification System.⁹

There is a wide spectrum of lingual frenula morphologies and elasticities, and deciding where to draw a line between normal variant and classic tongue-tie will depend on clinical judgement concerning the infant's capacity for pain-free efficient milk transfer. If the mother-baby pair are able to breastfeed comfortably with a visible anterior membrane (and many do) then this is not actually a 'tie' of the tongue, but merely a visible anterior membrane, requiring no further intervention.

Identification of PTT and ULT

Most unfashionably, I find no use for the diagnoses of PTT and ULT, and argue that they are misconceptions. In my experience, a wide spectrum of normal anatomic lingual and maxillary frenula variants are currently being misdiagnosed as a PTT and ULT. Labial frenula may be classified type 1-IV,¹⁰ but should not be pathologised as 'ties', let alone surgically ablated.

Mills et al new anatomical dissection of floor of mouth fascia in infants demonstrates the lack of anatomical basis to the diagnosis PTT.¹¹

Clinical tools merely aid clinical judgement

I've learnt over the years that clinical tools need to be simple, and only applied as aids in support of our clinical judgement, if we want best outcomes. The skill of the clinician,

whether in breastfeeding support or otherwise, is to synthesise a great deal of complex information across multiple domains, and to arrive at a clinical judgement about the likely efficacy or otherwise of intervention. Clinical judgement starts with training, but is built on experience. It is rarely useful (and may be dangerous) to rely on reductionist approaches including simplistic numerical scales as a substitute for clinical judgement.¹²

For example, although the Hazelbaker Assessment Tool for Lingual Frenulum Function (ATLFF) is a pioneering contribution, bringing us our first systematised approach to examination of the infant's tongue and oral connective tissues, it has been demonstrated to be unreliable as a tool for decision-making concerning frenotomy.¹³⁻¹⁵ In clinical practice many of the item criteria are highly subjective and dependent on the infant's interest in co-operating on the day. Although one study found moderate inter-rater reliability on the ATLFF's structural items, the authors did not find inter-rater reliability on most of the functional items.¹⁶ It became apparent to me that there is no correlation between what the tongue is observed to do during oral examinations and what occurs during breastfeeding, other than in the case of classic tongue-tie. Applying the ATLFF used up precious consultation time that could have gone into clinical breastfeeding support, and I finally abandoned it, creating my own pragmatic assessment tool instead.

Which professional groups should be identifying tongue-tie?

All health professional groups dealing with newborns and infants need to perform oral assessments and be capable of identifying potentially problematic lingual frenula, not just breastfeeding support professionals (BSPs). Here, I define BSPs as health professionals involved in the clinical support of breastfeeding, most commonly midwives, lactation consultants, and child health nurses. Other health professionals with special interest in clinical breastfeeding support may also be BSPs.

To whom do you refer an infant for tongue tie revision?

In my view, a severe classic tongue-tie in a newborn should receive a simple scissors frenotomy as soon as possible, in order to protect the woman from potential nipple damage. I perform frenotomies with scissors for CTTs in our community setting - all that is necessary to achieve excellent outcomes once intra-oral breast tissue volume is optimised through fit and hold – though the next step is to find funding for studies to investigate this.

Since a simple scissors frenotomy for a classic tongue-tie or anterior membrane is pain-free and of minimal risk, I may, with parental consent, err on the side of performing this even if I'm uncertain about its necessity. In my view simple scissors frenotomy can be performed by any registered health professional, such as midwife, GP, paediatrician, or lactation consultant with a health professional background, who has received frenotomy training.

A severe CTT that appears at risk of haemorrhage due to vascularised tissues may benefit from laser surgery, which will control the bleeding, but most of us won't encounter these, since they are very rare. I would refer to an ENT surgeon for this, who may use laser.

I can imagine occasions when a clinician might decide, having optimised intra-oral breast tissue volume, that some release of the oral connective tissues might be helpful. In practice,

I don't find this necessary other than with CTT, as the critical repair to breastfeeding occurs when intra-oral breast tissue volume is optimised. But even if a clinician decided that this scissors release might be worthwhile, there is no need for a diagnosis. The use of diagnoses increases parental pressure for intervention, even if parents are advised that the diagnosed condition is harmless.¹⁷ New diagnoses should only be introduced with great caution, because they risk a cascade of overtreatment.^{18, 19}

I no longer refer to paediatric dentists who use scissors, due to the risk of haemorrhage from their deep incisions, having observed babies subjected to painful sutures under the tongue or in the upper gum to control bleeding. Laser surgery reduces the risk of haemorrhage, but the studies used to claim that laser surgery for PTT or ULT improves breastfeeding outcomes show substantial bias and should be viewed with great scepticism.^{20, 21} Standards of evidence need to be high to demonstrate outcomes: why do our mothers and babies deserve a vastly poorer quality of science compared to say patients with diabetes or with osteoarthritis? Why should they be subjected to the inevitable risk of unintended outcomes that arise when simplistic 'quick-fix' interventions are put into complex systems?²¹⁻²⁵

What are the best techniques to revise a tongue-tie?

In order to answer this, we need to consider the biomechanics of infant suck during breastfeeding, including the role of the tongue and its necessary tethering tissues.

The model of infant sucking upon which laser surgery for PTT and ULT is based has been shown to be inaccurate by recent ultrasound studies.^{26, 27} The upper lip is not involved in breastfeeding or milk transfer, other than to rest neutrally against the breast and contribute (with multiple other contact sites during the symmetric face-breast bury) towards the seal. It certainly does not need to flange for pain-free milk transfer. Actually, if we can see the upper lip we are inviting inefficient milk transfer, fussiness at the breast, and nipple pain for many breastfeeding pairs. The tongue does not take an active lead in infant sucking, but responds dynamically to intra-oral breast tissue volume: that is, the tongue's shape, elevation and spread conform to the amount of breast tissue in the mouth.^{26, 27}

The critical biomechanical driver of healthy infant suck is a reflex depression of the jaw, which generates intra-oral vacuum. If the baby is fitted well into the woman's body, this repeated reflex action incrementally draws more and more breast tissue into the mouth until the jaw is held wide open, the nipple tip protected near the junction of the hard and soft palate, and optimal milk transfer occurs. The tongue does not need to actively lift midway to the palate, to lateralise, or to extend beyond the lower gum/inner edge of lower lip. It does not strip the breast or have peristaltic movements. In fact, the concept of peristalsis has been inappropriately applied to the tongue, since it refers to sequential muscular contractions in a hollow tube. We describe this new understanding of the biomechanics of infant suck in more detail in a new paper.²⁷ Lately, it's been claimed that the mid-tongue needs to actively rise up to the palate to create the seal, and that connective tissue tightness impairs this capacity. This fails to integrate the complex nature of seal, which is created by the whole face-oral-cavity-breast interface. Whilst the mid- to

posterior tongue needs to close off the airway at the beginning of the suck, intra-oral breast tissue volume will determine just which part of the palate and tongue meet together as the jaw depresses. The tongue is a muscular hydrostat, conforming to the intra-oral breast tissue, and there is no anatomic or clinical rationale for the belief that tight oral connective tissue impacts on the mid-or posterior tongue in the absence of a classic tongue-tie.

Since the tongue does not need to actively grip or strip the breast, or compress the breast for milk transfer, but simply follows the jaw depression and moulds around the available intra-oral breast tissue volume, we do not need to rely on unproven methods such as laser surgery to try to establish increased tongue mobility: a simple scissors frenotomy for a classic tongue-tie allows the tongue to safely perform it's moulding, cushioning role.

Do the mothers need to do any stretching or massaging of the incision site after a revision?

Wound stretching places babies at risk of oral aversion, due to repeated uncomfortable or painful digital intrusion. There is no scientific reason to believe that wound stretching post-laser frenotomy alters the inevitable contraction of scar tissue over time. Unfortunately, I regularly see short thick white cords of scar tissue under baby's tongues these days, a few months post-frenotomy.

Should any other techniques, such as improving the latch or using cranial sacral, be tried first? How do you decide?

This is, in my view, the most important question!

The promotion of surgical release of PTT and ULT is the latest in a series of inappropriately medicalised interventions for breastfeeding problems.^{28, 29 28, 29} We inhabit complex biophysical and sociocultural contexts, where 'trusting instinct' is definitely not enough for many. The painstaking art and science of supporting a woman and her baby's competence is easily sacrificed to the seduction of the medicalised silver bullet.

Fussing at the breast, difficulty latching, pulling or slipping off, back-arching (signs of positional instability and poor fit and hold) and/or excessive flatus, explosive frothy stools (signs of functional lactose overload) have been mistakenly diagnosed as signs of gastro-oesophageal reflux disease, allergy, or lactose intolerance since the early 1990s, and are now often attributed to oral ties. Similarly, excessively frequent feeding, excessively broken sleep, and marathon feeding are signs of poor milk transfer, often associated with crying due to poor satiety, but are also still commonly misdiagnosed as signs of GORD, allergy, lactose intolerance, and, most recently, oral ties.^{28, 30, 31}

These three very common breastfeeding problems are often inappropriately medicalised, still: suboptimal fit and hold, functional lactose overload, and conditioned hyperarousal of the sympathetic nervous system.³²

Suboptimal fit and hold leads to suboptimal positional stability, which may result in nipple pain and damage, poor milk transfer, and fussing at the breast. The neurobiological model of infant crying describes the conditioned sympathetic nervous system hyper-arousal that

occurs if an infant is repeatedly frustrated during breastfeeds by positional instability and poor fit and hold.³² Nipple pain is also commonly inappropriately medicalised as due to thrush, or even attributed to functional lactose overload, but (as long as we have excluded unusual medical conditions) is a result of poor fit and hold.³³ An overly abundant supply may result in both the baby pulling off during the let-down and a functional lactose overload, but won't result in nipple damage if the baby is positionally stable due to optimal fit and hold.^{28, 29}

To further illustrate the scale of the blindspot that we have in our health system concerning clinical breastfeeding support right now, mothers are still widely taught the strategy of shaping the breast with the ipsilateral hand, supporting the infant on the back of the neck, and stimulating a gape before bringing the baby on. Yet this approach has been demonstrated in Thompson et al's recent large and well-conducted Australian study to increase the risk of nipple pain fourfold.³⁴

The physiological approach to breastfeeding has been a major advance by our clinical breastfeeding support pioneers over the past decade, and is foundational.³⁵ However, baby-led breastfeeding is simply not enough for many of our women, who still develop nipple pain and other problems. Multiple well-conducted studies show that currently popular fit and hold strategies, including mammalian methods, do not improve breastfeeding outcomes.³⁵⁻⁴²

We have not yet paid enough attention to the complexities of empowering women to fit together with their baby across our gloriously diverse anatomies for pain-free efficient milk transfer. This needs to occur across great diversities of breast shape, breast tissue elasticity, nipple shape and length and elasticity, breast-abdominal interface, and infant chin, palate, tongue, lips and oral connective tissue.

It is not surprising that when clinical approaches are failing, BSPs look at variations of oral connective tissue, and refer for surgical intervention. Yet the breastfeeding problems don't result from tight oral connective tissues, but from inadequate health system investment at the frontier of clinical breastfeeding support skills. The controversy about oral ties in which we find ourselves mired is historically constructed, and no individual's fault; breastfeeding support professionals are simply doing their absolute best every working day to help mothers, in the context of inadequate health system investment in clinical breastfeeding support research and training.

In order to further research in this field, women need a teachable, reproducible and profoundly empowering approach to fit and hold in breastfeeding. In the hope that it might be helpful for others, we have taken steps to make the [gestalt breastfeeding approach](#), which we have found so effective in our clinic, widely available.⁴³ Gestalt breastfeeding builds on the work of our clinical pioneers, to integrate our own clinical experience and new understandings from ultrasound imaging, to empower women as they activate their baby's breastfeeding reflexes and experiment with positional stability and intra-oral breast tissue volume across diverse anatomies <http://www.possumonline.com/gestalt-breastfeeding->

online-program. Gestalt breastfeeding also integrates psychological strategies for managing difficult thoughts and feelings.⁴³

The digital intra-oral manoeuvres and massage interventions of craniosacral therapy, designed to stretch or relax muscles and connective tissue, and teach the tongue new movements, are also based on the same out-dated understanding of the biomechanics of infant suck. Unfortunately, a course of cranio-sacral therapy is an expensive intervention for parents, lacks an evidence-base, and is orally intrusive despite best intentions. Craniosacral therapy and related techniques simply cannot compare with healthy effects on postural alignment and functional musculoskeletal health achieved by optimal positional stability and fit and hold, repeated over and over for many hours each day.

Anything that directs parental financial resource and time investment away from the practice of optimal fit and hold delays the critical repair of the disrupted breastfeeding relationship, and is disempowering for women.

What are the potential outcomes if a true tongue tie is not revised?

Not breastfeeding impacts on orthodontic development.⁴⁴ However, to believe that therefore oral connective tissue surgery improves orthodontic development is to confuse association with causation, since there is no evidence-based biomechanical rationale for why surgical intervention (other than for CTT) might improve breastfeeding outcomes.

It seems sensible to think that a classic tongue-tie could interfere with articulation and dental hygiene for some, although the research definitions have been so confused by the introduction of the term PTT that this cannot be demonstrated at this time.²²

Currently, we find that families are given information about the developmental risks of not proceeding with laser surgery, which frighten them into compliance. There is no evidence to support these claims. Such information also increases the chances of reported positive outcomes post-laser surgery, because of the powerful neurobiological impact of primed expectation.

What type of instructions do you give mothers for breastfeeding a baby with tongue tie if the revision is delayed or not chosen?

We continue with gestalt breastfeeding support.

What are your thoughts about posterior tongue-tie?

Please see above.

Are there any limits based on scope of practice for IBCLCs and peer supporters diagnosing tongue-tie?

What do you think of social media sites where mothers are diagnosing tongue-tie for other mothers?

Social media is a powerful and overwhelmingly positive tool for mothers supporting mothers. However, women are reliant on the information that health professionals offer

them. Therefore, I don't like to blame mothers on social media who are simply acting on the inaccurate information given to them by health professionals, either in consultations or on health professional websites and blogs.

Instead, I do think the breastfeeding community needs to take a stand against the destructive 'groupthink' that has taken hold amongst some BSPs.

A groupthink is a well known psychological phenomenon that occurs when the desire to belong within a group of people results in dysfunctional decision-making. Groupthink requires active suppression of dissenting viewpoints, and in healthcare, can result in what has been called 'the medical miracles delusion.'⁴⁵ When groupthink is active, those who dissent intellectually may find themselves excluded or denigrated or their incomes put at risk, through the compilation of online preferred provider lists, through blogs and private Facebook posts questioning their competence, experience, or professionalism, and through various other mechanisms.

It grieves me to hear of personal and professional damage being done to courageous individuals who dare to speak out against yet another trend to unnecessary medicalisation in the care of breastfeeding mothers and their babies. It is such a vulnerable time of life. Mothers and babies need their health professionals to be freely engaged in the most robust and inclusive intellectual debates possible!

Thankyou to *Clinical Lactation* for providing just such a forum.

What resources can clinicians use for:

- **Recognising tongue-tie?**
- **Revision techniques?**
- **Videos, written materials, workshops?**
- [Gestalt breastfeeding online program](http://www.possumsonline.com/gestalt-breastfeeding-online-program) – multiple videos, photos and text describing a five step approach to optimising fit and hold, including psychological strategies for managing difficult thoughts and feelings <http://www.possumsonline.com/gestalt-breastfeeding-online-program>. There is a health professional licence available. All feedback is welcome as our non-profit organisation continues to develop this package for parents, health professionals, and research.
- **Protocols?**
- Since the evidence-base is poor, all current guidelines remain of limited use. Breastfeeding support professionals need to perform a thorough infant oromotor and breastfeeding assessment, apply a clinical intervention which optimises intra-oral breast tissue volume through positional stability and optimal fit and hold, and use clinical judgement to decide if scissors frenotomy is necessary.⁴⁶

Conflict of interest declaration: Pamela Douglas is Medical Director of Possums Education, which is a registered charity that sells [PIPPS Peer Support for Parents](#), [Gestalt Breastfeeding Online Program](#) and the [Possums Sleep Film](#) at www.possumsonline.com. All revenue goes towards the further development of education and research.

References

1. Hall D, Renfrew M. Tongue tie. *Archives of Disease in Childhood*. 2005;90:1211-1215.
2. Coryllos E, Watson Genna C, Salloum A. Congenital tongue-tie and its impact on breastfeeding. *Breastfeeding: Best for Mother and Baby*, American Academy of Pediatrics. 2004 Summer:1-6.
3. Coryllos EV, Watson Genna C, LeVan Fram J. Minimally Invasive Treatment for Posterior Tongue-Tie (The Hidden Tongue-Tie). In: Watson Genna C, editor. *Supporting Sucking Skills*. Burlington, MA: Jones and Bartlett Learning; 2013. p. 243-251.
4. National Health and Medical Research Council. Infant feeding guidelines: information for health workers. In: Government A, editor. 2012. p. <https://www.nhmrc.gov.au/guidelines-publications/n56>.
5. Joseph KS, Kinniburgh B, Metcalfe A, Raza N, Sabr Y, Lisonkova S. Temporal trends in ankyloglossia and frenotomy in British Columbia, Canada, 2004-2013: a population-based study. *CMAJ Open*. 2016;4:e33-e40.
6. Wattis L, Kam R, Douglas PS. Three experienced lactation consultants reflect on the oral ties phenomenon. *Breastfeeding Review* 2017;25(1):9-15.
7. Kapoor V, Douglas PS, Hill PS, Walsh L, Tennant M. Frenotomy for tongue-tie in Australian children (2006-2016): an increasing problem. *MJA*. 2018:88-89.
8. Watson Genna C, editor. *Supporting sucking skills in breastfeeding infants*. Burlington, MA: Jones and Bartlett Learning; 2016.
9. Griffiths DM. Do tongue ties affect breastfeeding? . *Journal of Human Lactation*. 2004;20:411.
10. Kotlow L. Diagnosing and understanding the maxillary lip-tie (superior labial, the maxillary labial frenum) as it relates to breastfeeding. *Journal of Human Lactation*. 2013;29:458-464.
11. Mills N, Pransky SM, Geddes DT, Mirjalili SA. What is a tongue tie? Defining the anatomy of the in-situ lingual frenulum. *Clinical Anatomy*. 2019:doi:10.1002/ca.23343.
12. Sturmberg JP, Martin CM. Diagnosis - the limiting focus of taxonomy. *Journal of Evaluation in Clinical Practice*. 2016;22:103-111.
13. Ricke LA, Baker NJ, Madlon-Kay DJ, DeFor TA. Newborn tongue-tie: prevalence and effect on breastfeeding. *Journal of American Board of Family Practice*. 2005;18(1):1-7.
14. Madlon-Kay D, Ricke L, Baker N, DeFor TA. Case series of 148 tongue-tied newborn babies evaluated with the assessment tool for lingual function. *Midwifery*. 2008;24:353-357.
15. Ballard JL, Auer CE, Khoury JC. Ankyloglossia: assessment, incidence, and effect of frenuloplasty on the breastfeeding dyad. *Pediatrics*. 2002;110:e63.
16. Amir L, James JP, Donath SM. Reliability of the Hazelbaker Assessment Tool for Lingual Frenulum Function. *International Breastfeeding Journal*. 2006;1:3.
17. Scherer L, Zikmund-Fisher B, Fagerlin A, Tarini B. Influence of "GERD" label on parents' decision to medicate infants with excessive crying and reflux. *Pediatrics*. 2013;131:1-7.

18. Morgan DJ, Brownless SB, Leppin AL, Kressin N, Dhruva SS, Levin L, et al. Setting a research agenda for medical overuse. *BMJ*. 2015;351:h4534.
19. Saini V, Brownlee S, Elshaug AG, Glasziou P, Iona Health. Addressing overuse and underuse around the world. *The Lancet*. 2017;doi:[http://dx.doi.org/10.1016/50140-6736\(16\)32753-9](http://dx.doi.org/10.1016/50140-6736(16)32753-9).
20. Douglas PS. Conclusions of Ghaheri's study that laser surgery for posterior tongue and lip ties improve breastfeeding are not substantiated. *Breastfeeding Medicine*. 2017;12(3):180-181.
21. Douglas PS. Making sense of studies which claim benefits of frenotomy in the absence of classic tongue-tie *Journal of Human Lactation*. 2017;33(3):519–523.
22. Francis DO, Krishnaswami S, McPheeters M. Treatment of ankyloglossia and breastfeeding outcomes: a systematic review. *Pediatrics*. 2015;135(6):e1467-e1474.
23. Power R, Murphy J. Tongue-tie and frenotomy in infants with breastfeeding difficulties: achieving a balance. *Archives of Disease in Childhood* 2015;100:489-494.
24. Douglas PS. Why Ghaheri et al's 2016 study does not show that surgical release for the diagnoses of posterior tongue-tie and upper lip-tie improve breastfeeding outcomes. 2016;under review.
25. Reid N, Rajput N. Acute feed refusal followed by Staphylococcus aureus wound infection after tongue-tie release. *Journal of Paediatrics and Child Health*. 2014;50:1030-1031.
26. Geddes DT, Sakalidis VS. Ultrasound imaging of breastfeeding - a window to the inside: methodology, normal appearances, and application. *Journal of Human Lactation*. 2016;DOI:10.1177/0890334415626152.
27. Douglas PS, Geddes DB. Practice-based interpretation of ultrasound studies leads the way to less pharmaceutical and surgical intervention for breastfeeding babies and more effective clinical support. *Midwifery*. 2018;58:145–155.
28. Douglas P. Diagnosing gastro-oesophageal reflux disease or lactose intolerance in babies who cry a lot in the first few months overlooks feeding problems. *J Paediatr Child Health*. 2013;49:e252-256.
29. Douglas PS. Re: Managing infants who cry excessively in the first few months of life. *BMJ*. 2012;<http://www.bmj.com/content/343/bmj.d7772/rapid-responses>.
30. Douglas P, Hill P. Managing infants who cry excessively in the first few months of life. *BMJ*. 2011;343:d7772.
31. Douglas PS. Excessive crying and gastro-oesophageal reflux disease in infants: misalignment of biology and culture. *Med Hypotheses*. 2005;64:887-898.
32. Douglas PS, Hill PS. A neurobiological model for cry-fuss problems in the first three to four months of life. *Med Hypotheses*. 2013;81:816-822.
33. Berens P, Eglash A, Malloy M, Steube AM. Persistent pain with breastfeeding: ABM clinical protocol #26. *Breastfeeding Medicine*. 2016;11:46-56.
34. Thompson RE, Kruske S, Barclay L, Linden K, Gao Y, Kildea SV. Potential predictors of nipple trauma from an in-home breastfeeding programme: a cross-sectional study. *Women and Birth*. 2016;29:336-344.
35. Schafer R, Watson Genna C. Physiologic breastfeeding: a contemporary approach to breastfeeding initiation. *Journal of Midwifery and Women's Health*. 2015;60:546-553.
36. Labarere J, Bellin V, Fourny M, Gagnaire J-C, Francois P, Pons J-C. Assessment of a structured in-hospital educational intervention addressing breastfeeding: a prospective randomised open trial. *BJOB*. 2003;110:847-852.
37. Wallace LM, Dunn OM, Alder EM, Inch S, Hills RK, Law SM. A randomised-controlled trial in England of a postnatal midwifery intervention on breast-feeding duration. *Midwifery*. 2006;22:262-273.
38. Kronborg H, Maimburg RD, Vaeth M. Antenatal training to improve breast feeding: a randomised trial. *Midwifery*. 2012;28:784-790.
39. Henderson A, Stamp G, J P. Postpartum positioning and attachment education for increasing breastfeeding: a randomized trial. *Birth*. 2001;28:236-242.

40. Forster D, McLachlan H, Lumley J, Beanland C, Waldenstrom U, Amir L. Two mid-pregnancy interventions to increase the initiation and duration of breastfeeding: a randomized controlled trial. *Birth*. 2004;31:176-182.
41. De Oliveira LD, Giugliani ERJ, do Espirito Santo LC. Effect of intervention to improve breastfeeding technique on the frequency of exclusive breastfeeding and lactation-related problems. *Journal of Human Lactation*. 2006;22:315-2321.
42. Kronborg H, Vaeth M. How are effective breastfeeding technique and pacifier use related to breastfeeding problems and breastfeeding duration? *Birth*. 2009;36:34-42.
43. Douglas PS, Keogh R. Gestalt breastfeeding: helping mothers and infants optimise positional stability and intra-oral breast tissue volume for effective, pain-free milk transfer. *Journal of Human Lactation*. 2017;33(3):509–518.
44. Peres KG, Cascaes AM, Nascimento GG, Victora Cg. Effect of breastfeeding on malocclusions: a systematic review and meta-analysis. *Acta Paediatrica*. 2015;104:54-61.
45. Braithwaite J. The medical miracles delusion. *The Royal Society of Medicine*. 2014;107:92-93.
46. Douglas PS. Deep cuts under babies' tongues are unlikely to solve breastfeeding problems 2016. Available from: <https://theconversation.com/deep-cuts-under-babies-tongues-are-unlikely-to-solve-breastfeeding-problems-54040>.