Bonnie: Hi, Alison! Thank you so much for joining us. This is going to be a really interesting talk. We’re going to be discussing tongue-tie. I shared with you earlier, I really was unaware of. I hadn’t heard anything about and yet, it’s a big, big subject in certain areas. So let’s start with—for people who like me were uneducated—what is tongue-tie?

Alison: Well, tongue-tie is a popular term referring to a congenital condition where the tongue is anchored closer to the floor of the mouth by the midline connection. So if you were to lift your tongue and look at yourself in the mirror, you’d see this little string-like structure on your tongue underside. That structure is a tendinous type of stabilizing structure to prevent your tongue from wandering around your mouth more than it ought to. If it’s too prominent, too short or too tight, then it can create some problems with tongue movement. Then subsequently, can cause some problems with other things like breastfeeding, bottle-feeding, speech development, speech articulation, airway development and a whole host of other things that we’re discovering about individuals who remain tongue-tied.

Once upon a time, we routinely screened for tongue-tie in this country right after birth. If a baby was tongue-tied, then the physician would just go ahead and clip the frenum. Clipping means that they would just take a pair of scissors and incise the frenulum in order to free up the tongue. That no longer happens in this country. So somebody like me who is almost 60 years old was right on the ending time when routine screening and treatment was happening. So I ended up having a tongue-tie that was left untreated until I was 42. Similar to you, I didn’t know anything about tongue-tie until I was in my 30s. I’d never even heard of it. I did, “What? What! What is this thing?” I happen to be in an intensive class when I was training as a lactation consultant. The instructor said, “Oh, look! You’re the one person in this class who is tongue-tied. Did you know that?” I said, “A what? Huh? What do you mean?”
It was several years later before I actually had it treated because I, like the experimenter that I am, wanted to have the treatment done without any anesthetic. My dentist wasn't really comfortable with that notion until he had done some research. So two years later, he calls me up and he says,"Okay. I'm ready to do this treatment without any kind of anesthetic. I feel confident now that you're not really going to feel anything but some pressure." So I said,"Great! Let's do it. Let me line up my myofunctional therapist so that I could be sure that I've got all the appropriate therapeutic strategies in line so post-surgical correction, I can get everything straight around."

So that's what we did. Sandy Holtzman who is a friend of mine now, as a result of her doing my myofunctional therapy regimen, was there as well videotaping the whole process. The room was crowded with practitioners who'd never seen an adult revision done without anesthetic. It became kind of a circus. It was really healthy and good for me to get my frenulum revised and to have themyofunctional therapy, because it really changed. It changed my eating habits. I was swallowing too much air. It reduced my tension headaches dramatically. I was sleeping better. My goodness! My speech articulation problems went away. Of course, the therapy helped with that. A tongue thrusting habit was rectified. My occlusive relationship's completely changed. I mean, it was just a really, really excellent decision for me to go ahead and have it done.

Now looking back on all of the health issues that I had, including loosing teeth, as a result of not being apt to clean them properly, I wish that I had been one of those babies who were clipped right after birth, instead of waiting it for 42 years to get it done.

Bonnie: Alison, you are a lactation consultant specialist. That's primarily how you are known, but I think you have a lot of other achievements besides just that that I would like our viewers and listeners to be aware of. You have a Master's degree in Human Development, specializing in Human Lactation and a PhD in Developmental Psychology, plus there are a few other things in there too. This makes you uniquely qualified to talk about, not only breastfeeding, but also something called tongue-tie which is what we're going to be talking about today. Can you just explain to our viewers and listeners a little more in detail of what your background is and how it—no pun intended—ties into tongue-tie?

Alison: Absolutely. During my master's degree program is actually when I discovered that I myself was tongue-tied. So I have my fourth child during my master's degree program, and he was born with a tongue-tie. I thought,"Hmm, you know? I'm really interested in this because it's personally relevant to me. I think that I could sustain the attention and the passion for the subject matter of writing my thesis if I wrote it about tongue-tie." What I ended up doing is to develop the diagnostic criteria for tongue-tie that are used to this day. So that was way back in the late 1980s. The diagnostic criteria that are used for the research studies that are conducted on tongue-tie in infancy. So that's my jumping off place with this.

In order to test those diagnostic criteria, I had to develop a screening tool that is evidence-based—one that is valid, reliable, sensitive and specific. That screening tool called the "Assessment Tool for Lingual Frenulum Function" is a standard that is used in many countries around the world at this point in time. So that's
really the foundation of my interest in this subject matter. It has just been one of those things that has become, not just a passion of mine, but a long-standing interest as I think about the genetic and familial connections from one generation to the next in terms of this congenital anomaly.

Bonnie: So here you are, the preeminent expert in tongue-tie in the world. I think that is a safe way to describe you. I hope our listeners appreciate the quality that we have here with Alison as today's speaker.

Alison: Well, thank you. That's very kind.

Bonnie: Now, I have to ask you this question. I'm presuming you saw a dentist before you were 42 years old. So why didn't your dentist—or maybe you've moved and had multiple dentists—notice this, mention it, bring it to your attention, say maybe it's something that you can fix? It sounds like you had no clue even into adulthood. Why do you think that is?

Alison: It's just lack of training. If you go through school and nobody ever tells you that this is a condition that can create problems with teeth cleaning or speech articulation, etc. then it's not something that's on your radar screen, and so you just ignore it. Fortunately, we're at a time when education is improving that we have a lot more healthcare practitioners who are knowledgeable about this. But the other problem is that—and right now evidence-based medicine is a really big deal—the evidence base for tongue-tie is perhaps less than some practitioners would hope that it is. But that evidence-base is definitely growing. So there's a burgeoning awareness about this. Unfortunately, there's a bunch of mythology surrounding tongue-tie, both that undermines a person's ability to get proper care, as in my case, but also in overdoing it.

So we've got bunches of misinformation and disinformation floating around in social media that is creating an "industry" for lack of a better word, where we have parent after parent so concerned that their kid is tongue-tied that they present themselves to the physician or dentist's office, only to have that physician or dentist have lack of information about proper assessment. They go ahead and perform surgery on the baby when that's not at all what's going on. We see some pretty tremendous harm happening as a result of that. So we need to achieve balance here. We need to increase our evidence-base, stick to the evidence that we currently have to inform our clinical decision-making process, but certainly make available surgery for those individuals, whether they'd be a newborn or an adult like myself to get the care that they need.

Bonnie: There are a lot of controversies surrounding tongue-tie today and a lot of misinformation out there on the web as so commonly happens when it comes to medical- and dental-related things. What generated these controversies? Where are they coming from? What is going on out there?

Alison: I think it's a complex issue. The lion share of the controversy is derived from the mythology that persists that tongue-tie either: (a) doesn't exist; or (b) doesn't cause any problems, in spite of the massive amount of literature that demonstrates that it does. So we've got a real bias against screening and taking tongue-tie seriously in infancy. Maybe less so when a child is demonstrating a whole host of signs and symptoms, and so is more likely to have a frenotomy than an infant does.
I think that it's ignorance, meaning lack of training and education on the subject matter. I think that we have controversies that have developed by the persistence of impassioned, perhaps even egocentric attachment to trying to explain a whole host of problems being the result of an untreated tongue-tie, in combination with the effects of social media which enables us to disseminate information in a way that we've never been able to disseminate it before. So somebody's thought, guess, musing about the subject matter then can be put on Facebook or some other social media site and perpetuated throughout the world as if it's a fact. Then somebody gets behind it and decides that this is the absolute truth. Of course, we know there's really no such thing as absolute truth in science, though we have to continue to explore and experiment so we can arrive at a relative truth.

So much of this misinformation is getting disseminated via social media. I think it's a multi-vector kind of a problem perpetuating these controversies. Parents are often times left in the middle like they always are between two professionals who are arguing based on two different mythologies. They're not even looking at the evidence. So the parent is going, "Okay, who do I listen to?" We have lots of caring practitioners who have jumped into the fray as it were and decided that they're going to provide surgical correction to improve access to treatment, who aren't properly trained to assess. Parents present themselves to the office, and they go ahead and do surgical correction. That has generated a tremendous amount of controversy.

Right now, we have polarization amongst those people who are discussing tongue-tie. A polarization that is not necessary and isn't helping any matters because it's really not furthering the goal, which is to be able to properly assess, determine who's tongue-tied and get them the proper treatment and post surgical treatment for the condition.

Bonnie: What are the best approaches for working with tongue-tie?

Alison: Tongue-tie is one of those things which is not going to improve with therapy. The compensations that develop as a result of untreated tongue-tie will respond to therapy. So it's going to be a dual approach. The lingual frenum does not stretch over time; we know that. It's fascia. Fascia doesn't stretch. So surgery is going to be a necessary part of the process should an individual or the parent of the baby elect to do so.

Surgical correction can occur either with scissors, scalpel, electrocautery or laser. So there are four different approaches to it. Most of the research that's been done on infants has been done with scissors surgical correction where just a simple incision is performed. We know, for a fact, that's efficacious. Laser is the new kid on the block in the treatment of tongue-tie, and I think it's here to stay. I think that there is enough desire to see laser treatment continue that we're going to see it staying around for a while. The question is whether or not laser treatment is more efficacious, less efficacious or equally efficacious as scissors. It is certainly more invasive. It is more dangerous, especially in the hands of a non-trained practitioner. Currently, there are no requirements that the individual wielding a laser be trained to utilize their laser.

So that can be problematic with somebody who has all good intention but
doesn't realize that both their choice of the type of laser and its interaction with the tissue that they are treating is an important consideration, and learning how to use that particular laser in the most optimal way inside a very, very small baby's mouth is a very important aspect. Being well-trained and proper assessment is very key in all of this. So we have surgery, but then we have the aftercare that has to go on. That aftercare, especially with an older child and an adult involves myofunctional therapy. That is absolute key component because you have to get rid of all of the compensations that have occurred as a result of leaving that tongue-tie untreated.

This is a team approach. It's never one individual who's involved. If we have a breastfeeding baby, then we're going to have the lactation consultant involved as well. But the rules apply to the lactation consultant, as well as the other practitioners. She must know how to assess properly and how to evaluate the post-surgical aspects so that she can take care of whatever the compensations are in that baby and correct those. With bottle-feeding babies, speech language pathologist who's a feeding specialist will be the key therapist post-surgical correction,

Bonnie: So this is really talking about utilizing a team to treat this. This is not something you just go in and snip the frenum which—just to repeat for our viewers and listeners—is that little thing that's holding your tongue to the bottom of your mouth, that little tiny strip of tissue there. We don't just talk about going in and snippingit and that fixes everything. There's a lot more involved to it.

Alison: Absolutely. Yes.

Bonnie: Alison, you have mentioned myofunctional therapist and myofunctional therapy. Could you just explain for our viewers and listeners what that really is? That's not a term that most people are familiar with unless they are told they need it. What does a myofunctional therapist do? What is their background? What is their training?

Alison: Well, that's not an area of my particular expertise in terms of what kind of training they receive. My experience is really based on what my myofunctional therapist did with me in order to correct the muscular imbalances that were going on. You're using 60-some muscles to coordinate your swallowing with your breathing. Sometimes, you have muscles that are stronger than others that shouldn't be. So you want to achieve better balance and coordination in order to achieve a coordinated swallow to protect your airway.

From my understanding of what a myofunctional therapist is about is correcting those kinds of imbalances and making sure that your tongue is in the right position inside your mouth and to position that tongue in such a way that during the swallow that it's going to the right area on your palate and that you're recruiting the correct muscles in order to make that swallow happen in the most optimal way possible. So that's just a little tidbit on that. I think the myofunctional therapist would have a lot more to say about how they’re trained, which is pretty intense, and how that differs from just plain old speech language pathology types of therapy.

Bonnie: I should mention, again for our listeners and viewers, that we do have another interview with someone who is one of the top myofunctional therapists. So
hopefully, they will also listen to that interview and it will all tie together with
what we have been talking about. So thank you.

I would like to circle back. You told the story of yourself and having the
treatment when you were 42 and your dentist had promised that he could do it
without any pain. Was it without any pain? How did he do it? Which technique
did he use? I'm just curious.

Alison: Well, at that time, laser was a relatively new phenomenon in dental circles, and
my dentist did not have access to that kind of technology. I'm not sure that I
would have used it anyway back then in early days. So he used scissors.No. In
fact, for me, I did not experience any pain. I felt pressure but I felt no pain
whatsoever, which was a little bit surprising to me. I thought that I was being
really courageous when I went in to experiment and just feel what it felt like,
because I wanted to have a better sense of what might this be like for a baby
that I'm referring because currently, we don't use anesthetic to do a scissors
revision on a baby, because the pinch from the anesthetic needle is probably
worse than the pain from the actual clipping.

Now, did I have soreness afterwards? Yes, I did. I had a little bit of soreness at
the wound site which was very, very tiny because it was a scissors revision. So
for about 24 hours, I had a little bit of like stiffness and soreness, the kind that
you get when you have been sitting around for a long time and get up when
you're 60 years old and you try and move around and feel really stiff. That kind
of sensation. The myofunctional therapy exercises were easy to accomplish. They
didn't cause me any pain. I think I took one dose of ibuprofen about four hours
after the procedure, and that's all that I had to do. Now, I'm not necessarily
advocating that adults don't have anesthetic for their procedure. I'm just simply
saying that this was my experience, and I was pleasantly surprised to find out
that my guess that I wasn't going to have any pain was accurate for me. I was
able to move my tongue around my mouth and start doing the therapy
immediately after and without any kind of discomfort. That was the strategy that
worked well for me.

Bonnie: I'm glad it turned out so well.

Alison: Yes. Absolutely.

Bonnie: Where would our viewers and listeners find the best and most accurate
information about tongue-tie? Obviously, social media is not the place to be
looking.

Alison: No. It really isn't. We can't just throw out the baby with a bathwater. Online can
actually be a great source of information if you know where to look. So I think
any site that has a very heavy evidence-based. In other words, all of the
information is referenced with research studies. If you can find a site that uses
references to support the information that they are providing to you, then that is
going to be a good site to pay attention to. My site has some information on it.
There are, unfortunately, not a whole lot of books written on the subject. There
are two books: one that I co-authored and one that I authored that are available
at my site and that is going to be evidence-based accurate information that you
would receive in making a decision.
There are all kinds of research studies available and you could go to a US government site at PubMed if you like to read original articles on the subject matter to uncover an enormous quantity of research studies being done. You have to read those studies with a critical eye because some of them have very flawed methodology to them; some of them are really quite good. So I think that there are several different places and yet at the same time, knowing exactly where to go can be problematic when you're just initiating research.

Bonnie: Could you please give our listeners what your website is and the titles of those two books that are available?

Alison: Absolutely. So my website is www.alisonhazelbaker.com. I run a blog there. I cite the evidence with all of the things that I write about tongue-tie. The two books are called, The Color Atlas of Infant Tongue-tie and Lip-tie Laser Frenectomy. So that is a wonderful resource showing you proper surgical correction. It includes 31 different cases replete with colored pictures, but it also contains four chapters of really, really solid evidence-based information about sucking physiology, proper assessment for tongue-tie, what the term lip-tie means, although that's a very controversial subject as it should be because there's really no diagnostic criteria for this thing that's being called lip-tie and lots of misinformation out there about it. The second book is called, Tongue-tie: Morphogenesis, Impact, Assessment and Treatment. That is a book that came out in 2010 and is tactful of evidence-based information about tongue-tie across the life cycle.

Bonnie: Those two books, just going by the titles, sound like they might be more aimed at the clinician, dentist, dental hygienist and the physician. Are these books something that the average person can read and get something useful from?

Alison: Yes. I think that the Color Atlas is for professionals, but most of it is written pretty accessibly and parents might be interested to see some of the pictures. The Tongue-tie: Morphogenesis, Impact, Assessment and Treatment is written very accessibly so parents with a high school education are going to find it a very readable information.

Bonnie: Okay, great. Thank you. I just want to clarify that. If we have a listener or viewer out there who's watching all of this, and she says, "I think my baby, my child or maybe, even me that I have tongue-tie. Where do I go for help? How do I know whether or not this is a problem for myself or my children?"

Alison: Okay. So let's say that you have a baby and that you're concerned. Maybe, you've been on the internet in one of the sites and all of the parents there are saying, "Oh, your baby could be tongue-tied because you're having such and such signs and symptoms." Don't go there for information because that's a bunch of misinformation. Instead, what you want to do is link up with an international board certified lactation consultant who actually has been trained to assess for tongue-tie, utilizing either the assessment tool for lingual frenulum function or the infant frenotomy protocol. Those are the two evidence-based screening tools. If the lactation consultant has not been trained to use one or the other of these tools, then you need to find someone who is.

Otherwise, if your own physician has been properly trained to assess for tongue-tie... Many of them have been. So it's not true that physicians across the board
don't know what they're looking at. There are many physicians who have been in practice for a while who are really quite good at it and who also do scissors frenotomy. So you can go to your physician and ask them, "Is this something that you're trained to do?"

Some ENTs are properly trained to assess for tongue-tie. Some dentists are properly trained to assess for tongue-tie. But be careful. You want to be sure that again, they are using an evidence-based screening tool. Unfortunately, some dentists are using a classification schema authored by a dentist that has recently been found to be an invalid way to screen for tongue-tie. It's important to ask the right kinds of questions. So you do have access. Sometimes, however, especially if you live in a smaller community rather than a medium to large city, you're going to have some difficulty finding somebody who is knowledgeable and in which case, you may have to travel for an hour or two in order to find somebody who knows what they're doing.

Bonnie: Is there a website or a directory someplace to look up who lactation specialists are, for instance in the country and find somebody close to you?

Alison: Absolutely. You can find a directory of international board certified lactation consultants at www.iblce.org. All of the certified lactation consultants from around the world are listed on that site.

Bonnie: Terrific. Thank you. It's good to have resources. So if I know my child had been diagnosed with tongue-tie and maybe I don't want to get surgery for my child. What can I do instead? What are my alternatives?

Alison: I'm a real fan of myofunctional therapy. I think those individuals who are specially trained to deliver this form of therapy are a wonderful resource for all ages, except for infants because there's no infant protocol using myofunctional therapy at this point in time. For children and adults, I just can't say enough about this form of therapy having personally experienced and seeing it in action. I think that by visiting the www.iaom.com website for example, and www.aamsinfo.org, the new organization that has a listing of myofunctional therapists are both good resources to find a therapist in your community. These people are so specially trained to work on muscular balance and function that they just don't get the near enough credit that they deserve. So that would be the alternative that you're going to seek.

There is a little gap in there. Lactation consultants are the ones who can work with the younger babies, but once they become toddlers and do not follow directions, we've got a real big gap in there, until the age at which they can follow instructions, in terms of getting them therapy. This is why we like to do screening and treatment early because when we have a baby younger than six months, we have a really good chance of being able to prevent problems from developing and to correct some of the compensations before they turn into worse compensations. Use your speech language pathologists who are specially trained in myofunctional therapy. They're going to be a great resource.

Bonnie: You had indicated to me earlier that you have a couple of interesting cases about tongue-tie that you would like to share with our viewers and listeners that might be instructive. So could you tell us what those are please?
Alison: Absolutely. Let me share two different cases: one that is on an unfortunate situation where the baby was assessed by someone who didn't have proper training and was surgically corrected and didn't need it; and the case of a mother who had a baby who did in fact need it. Again, my area of expertise is working with infants, as opposed to children and adults. So in the latter case, and this is just a case that occurred yesterday, where the mother’s first child received a frenotomy for both the upper lip and the tongue. Now, the upper lip didn’t really need to be done but a myth going around that every baby who has a tongue-tie also has what’s called a "maxillary lip-tie." This is not at all evidence-based information. So if you’re one of those parents who has heard this, do be informed that there is no data to show that having a prominent maxillary frenum interferes with infant feeding.

Bonnie: Could you just explain what that is?

Alison: Yes. So that would be that tissue that's underneath the lip that attaches the lip to the gum.

Bonnie: Okay. Thank you.

Alison: Yes. That's called the maxillary labial frenum. So her previous baby received this surgery, and the surgery didn't help. The mother walked away still having infant-feeding problems. So her practitioner was one of those people who were listening and paying attention to social media, maybe went to a training where they insisted that any breastfeeding problem is usually associated with tongue-tie. Do keep in mind that only three to five percent of babies are afflicted with a tongue-tie. This is not nearly as common as people are making it out to be. There are lots of different causes of breastfeeding issues, and tongue-tie is only one amongst many.

She ended up being referred to me about three months down the road still having persistent breastfeeding problems. We discovered that this baby actually had a condition known as torticollis, which presents very similar breastfeeding issues as a tongue-tie. So here, this baby had been surgically corrected and three months down the road was still having breastfeeding problems, but actually had torticollis and never really did have a tongue-tie or a lip-tie.

That case is unfortunately, a very common type of occurrence. So this is why I emphasize that the practitioners who are doing the assessment and the treatment need to be properly trained. This case that I just saw yesterday then was the second baby. She came in and said,"Well, instead of now taking this baby to go and see the practitioner, I want to be sure that we’re ruling out every other possible cause of the breastfeeding problem before I take my baby in for surgery." So her baby at 11 days, we checked out the baby and this baby actually was truly tongue-tied. So we were able to catch it early on and center for proper revision via a trained individual who knows how to properly assess as do I, and also has done thousands of procedures and was properly trained to do a scissors frenotomy. So I see them again tomorrow, and I’m hoping that we are getting the kind of results that we’re looking for in addressing this baby’s particular concerns.

Bonnie: OK, seems like a happy ending or potentially a happy ending.
Alison: I hope so. I hope so. Yes.

Bonnie: This has been absolutely fantastic information. Once again, thank you. What I'd like to do now to pull things together is if you can give us an overview of all the high points and the real takeaways that we want people to have from this interview in the next three to five minutes, I'd say. Something like that.

Alison: Yes, absolutely. I think that there are several take home messages from this. One, tongue-tie is a real thing and it does cause real problems. It can have an impact on infant feeding, whether that baby is breastfed or bottle-fed. The functional deficits are the same, regardless of feeding method. So it's important to understand that if we do proper screening using an assessment tool that is evidence-based, we can catch those babies who are truly tied and get them the appropriate treatment in a timely manner, because tongue-tie is not going to change overtime. The frenum doesn't stretch. That individual is going to be tongue-tied for the rest of their lives, unless they receive surgical correction. Now, that surgical correction can be very, very simple, easy and relatively inexpensive. It can prevent a whole host of problems later on down the road. Prevention is a legitimate reason to go ahead and have surgery.

Surgical correction usually involves a pair of scissors, but because laser has become a popular alternative, we find a lot of dentists especially getting involved in performing laser treatment. You, as the person seeking treatment, need to ask that practitioner lots of questions. What kind of laser are you using? How does that laser perform in the surgery? How much collateral damage is a natural part of using that particular type of laser? What kind of training did you get in assessment? What assessment tool are you using? What are your post-surgical notions about aftercare? Do you refer for therapy after you have done a surgery? These are important questions to ask. Then it's important for you to know that if somebody is suggesting to you that you rub the wound bed post laser correction for a certain period of time causing your baby to cry and even become orally defensive, know that there's no evidence to support doing such a thing. You don't get in and break down primary wound healing. That causes excessive scar tissue formation, and that is evidence-based.

So it's important to ask lots of questions about the procedure, skills of that particular practitioner and what they are recommending post-surgical revision. Then it's important for you to know that you need to have your other team members put into place: your lactation consultant, if it's an infant who is breastfeeding; your speech language pathologist or OT who is a feeding specialist, if you're bottle feeding. If your child is older or it's you yourself, then you need to put into place your myofunctional therapist so that you can make sure that you're correcting any kind of compensations.

Bonnie: You would also need to point out that this is not nearly as common as people might think it is based on social media.

Alison: Right. So we have evidence— prevalence statistics— that are starting to come to popular awareness that only three to five percent of infants are actually, truly tied, and that the vast majority of those infants have an anterior tie rather than what has been dubbed the posterior tie. The posterior tie is the exception rather than the rule. We have to keep these things in perspective.
Torticollis, on the other hand, is a burgeoning problem and affects, at least 25% infants. That's due to a variety of causes, including our cultural birthpractices. So we have to keep this in perspective. One of the least likely causes of a breastfeeding problem is actually tongue-tie. Yet, if it is happening, the only thing that's going to correct it is surgical correction. So if your baby is one of those three to five percent of babies, then it's important to get a timely treatment.

Bonnie: Just briefly, can you go over if there is no treatment? If someone is left with the tongue-tie into childhood, adolescence or adulthood, what are some of the problems associated with untreated tongue-tie?

Alison: We have very strong evidence that demonstrates that we can see compromised speech articulation, even delay in speaking as a result of tongue-tie, that children can have poor saliva control so they often times will leak saliva out of the front of their mouth because they cannot gather it up and swallow it correctly. We have evidence to show that they will recruit accessory muscles in order to make the tongue work as correctly as possible. We have evidence that shows that they can develop a tongue thrusting habit, which can create poor occlusive relationship between the upper and the lower teeth. We also have evidence that tongue-tie can cause sleep disordered breathing, as early as infancy that it can compromise midface development and can create postural instability. So that's quite a bit, and we're discovering new things all the time. The thing that we have not established is that tongue-tie causes sudden infant death. That has not at all been well-established even though that's all over the internet right now.

We also don't have good evidence to demonstrate that folic acid is causing an increase rate of tongue-tie, nor do we really have a clear notion about the role that epigenetics might play in the prevalence of tongue-tie. So there's a lot that we need to learn but we have enough evidence to show that tongue position and posture inside the mouth is important for overall development of the airway and the cranium and of the relationship between the upper and lower jaw.

Bonnie: Thank you. All very important information that I'm guessing most of the audience probably have not heard before. They've heard some of the wrong information. So thank you so much for giving us the straight story from the expert.

Alison: Happy to do so, and I appreciate you having me. It was a pleasure.

Bonnie: Thank you so much, Alison.

Alison: Alright. Thank you.