



## Episode 608: Dr. Steven Lin on the Collapsing Jaw of Our Next Generation and How We Can Fix It

Child: Welcome to my Mommy's podcast.

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Katie: Hello, and welcome to the "Wellness Mama Podcast." I'm Katie from [wellnessmama.com](https://wellnessmama.com). And this episode is all about oral health, and more specifically, the collapsing jaw of our next generation and how we can fix it. And I'm here with Dr. Steven Lin, whose work I have followed for a while. He is a world-leading functional dentist, the author of "The Dental Diet," which I highly recommend. If you experience any oral health problems, he really goes into a holistic understanding of those, and how to fix them.

And his work focuses on the understanding of dental disease through root cause nutritional protocols, and so, think of him as, like, a holistic doctor but for your mouth. His clinical protocols have redefined interventional orthodontic treatment with a goal of preventing braces in kids through understanding the causes of jaw growth and correcting them when children are teenagers, and we go deep on a lot of these topics.

Today, we're talking about a lot of the misconceptions for parents when it comes to a child's jaw growth, how we can help our kids grow a jaw that fits their adult teeth, the factors that come into play with early tooth

decay and collapse of the jaw. We talk about Dr. Weston A. Price's work, and we talk about factors that make a difference in jaw structure in utero and at different phases of childhood development.

He talks about what to look for in your kid's teeth and jaw development at different ages, and how to be proactive in making sure that they're developing as optimally as possible.

He talks about a mistake many parents make when introducing foods to babies, how keeping the nose clear might actually be more important than cleaning the teeth early on. We talk about problems with mouth breathing in children and adults, how to reprogram you or your child's breathing, and improve tongue posture for better sleep. How sleep connections are related to jaw development, as well as, how poor sleepers often have food issues as well, and then, he talks about some dietary things that can help with any of these things.

And, so, as always Dr. Steven is a absolute wealth of knowledge and he shares so much information in this episode. I know you will learn a lot, I know I did as well. Let's join Dr. Steven Lin. Dr. Steven, welcome. Thank you so much for being here.

Dr. Lin: Thanks so much for having me back, Katie. It's great to talk again.

Katie: It is so great to chat with you again as well. And as I've said on this podcast before, I love talking about oral health because I think it's so foundational to the health of the whole body, and I think there's a lot of misconceptions and misunderstandings when it comes to different aspects of oral health. We got to delve deep on some of those in our first episode, which I will link in the show notes, but in this one, I'm especially excited to talk to you about jaw development and bone structure and some other aspects we didn't get to go deep on last time because it seems like there's a lot of misinformation that goes on in this realm, and I know you have done a lot of research and work hands-on in this, and I'm excited to learn from you.

I guess to start broad, I would love to talk about maybe crooked teeth, in general, because I feel like that's the problem that's top of mind for a lot of parents, is if their kids' teeth are crooked, their immediate thought is braces, or we need to fix the alignment of the teeth. But what should parents be aware of when it comes to crooked teeth in kids?

Dr. Lin: Yeah, kind of as an overlying message for parents out there. And one of the bigger misconceptions, I think, that really exist for parents, you know, with young children is that they can actually participate in their child's jaw growth. So, they can understand how their child's teeth are developing and actually help their child to grow a jaw that fits adult teeth. Now that's something that we probably didn't grow up with Katie, but having kids, you know, you have six kids and I've got three kids now, actually since we last spoke, I had three kids under 3, and so my oldest is now 4. And so I'm kind of living, you know, both sides of this world where I'm watching my own children grow and we're treating these children in the clinics.

And the great thing that I'm, you know, seeing now is that as this has been going on, you know, since I wrote my book in 2018, the parents are starting to wake up to this and we have people coming into the clinic and asking, "Hey, this seems to be not right, how my kids' teeth are coming together." Or "There's this habit that I'm not sure that seems right. You know, what can we do about it?" So, it's like an awakening in a sense that parents really should be focusing on the growth of the jaw because it influences how a child feeds, how they sleep, how they breathe, and ultimately, the base of the jaw really forms the foundations of the brain for the child and the neurological system, the neurohormone system that releases all of the endocrine hormones throughout the body. You know, so when we're really thinking about any kind of growth development factors for a child, we should be thinking about how their jaw is growing.

Katie: That makes so much sense. And I feel like it's the opposite of how it's often thought about, at least in the U.S. where I am, I think we look at the teeth and just think of like rearranging the teeth versus making more room for the teeth to fit naturally without having to be kind of rearranged in such a harsh way. And I think also this concept was first introduced to me, I read in your work as well, but from Dr. Weston A. Price years ago when I was first getting into health, I read "Nutrition and Physical Degeneration," and his comparison of the jaw structure of different cultures compared to the modern Western world and how drastically different it was and how drastically it shifted in the span of just one generation when some of those factors were changed.

So, let's talk about some of the factors that come into play here. And I know that there are things people can do even if their kids are already older, but I'd love to talk about, you know, in a best-case scenario, how do we set this up pre-birth? How do we set this up from the ages of your kids? Like, how do we give our kids the best shot at this?

Dr. Lin: Yeah, exactly. So, Weston A. Price's book "Nutrition and Physical Degeneration" was my kind of entry point into this whole world. You know, as a dentist conventionally trained in biomedical science and then into clinical dentistry, I was taught that, you know, crooked teeth is something that you identify. So, this is this type of crooked jaw and this is this type of malocclusion, so class 1, class 2, class 3. And that's it. This is how you fix it. You refer them to orthodontics or you do general practice orthodontics to correct them.

Weston A. Price was a guy that went around in the '30s and he showed that human populations that ate the traditional diet, they do not get any of the dental diseases that we see in today's modern population. So, tooth decay up to 30%, and up to 50% in pediatric populations have decay now. Now, he showed that both decay and crooked teeth happen in one generation when we feed our kids the modern diet. And so when the parents and when the kids have the modern diet, when we come off traditional foods, then we begin to see this collapse of the jaw and we begin to see a rotting of the teeth. So, up to 30% to 50% in tooth decay.

And so for a dentist trained, you know, in, you know, the early 2000s, this was normal to me. This is like my identification process. You know, we look at cavities and we look at crooked teeth and we fix them, and that's it. Now, Price was talking about, "Hey, how do we get in and understand why this is happening?" And so that's where this whole kind of melding between, you know, oral diagnosis and functional medicine principle where we're actually thinking about why diseases are happening, starts to really show us that, hey, the childhood jaw growth and development period should really be something that we're watching closely.

And there's a lot of evidence that popped out in the early 2000s, the Human Genome Project that showed that the genome, whilst we can map the amount of genes, it doesn't explain the amount of complexity in the human body. And that kind of unearthed the whole science of epigenetics that then showed us that, hey, our environment is influencing the way genes express. And then that begins to show that even before a child is born, there are epigenetic factors that are influencing how a mother will pass on, how a father will pass on his epigenome to their unborn child. And then how that relates to their growth and development in the womb. And this is what we're seeing now is that many kids, babies, in particular, aren't born with a jaw that really gives them a good go at latching and feeding well.

And that's all the start of it. So, a child's jaw starts to grow, you know, roughly from about 12 weeks in utero. And one of the big factors that we miss is that the disconnection of the areas of the fetus that disconnect the jaw and the tongue actually happens about 12 weeks. And so in this period, when you don't get a disconnection, you get a tethering of tissue between the tongue and the jaw, which we know as a tongue-tie or a lingual frenulum, which then can pin the tongue down to the floor of the mouth. And this is a reason or

one of the ways that, you know, neonatal influences can actually show how jaw growth can be affected, one, by nutrition, because we know that midline deficiencies such as tongue-ties are affected by folate and B vitamins and so forth.

So, when we don't have the correct versions of B vitamins, it's just like we get spina bifida, and that's why we take the activated folates and so forth. But you also get the midline deficiencies in the mouth, which are potentially the lingual frenulums and the clefts as well. So, we have these nutritional inputs, which Price showed were related to fat-soluble vitamins. You know, the teeth and the jaw bone and the immune system all rely heavily on vitamin D.

And we know now that through pregnancy, you know, almost at, you know, epidemic proportions that we have vitamin D deficiency. And we know that early childhood caries is related to vitamin D deficiencies. So, a vitamin D deficient mother will have a high proportion of children with early childhood caries, which is the black marks or the brown marks along the gum line, which is really tragic, you know, for a young family because it's such a hard thing to go through.

But we're starting to see now that these deficiencies are playing a role into how a child then develops, and the eruption of the teeth is the same. So, you know, in the first, you know, 6 to 12 months, a child starts to get their first teeth erupting. And in those times, you know, what's happening is that the child's beginning to learn to chew, you know, converting from breastfeeding to solid maybe, or maybe they are out bottle feeder, or maybe they have a habit like a thumb-sucking habit or a pacifier that stays through to over 12 months.

All those things start to add on to how the teeth and jaw are developing. And the principles of jaw development lie within the physical factors, which is nasal breathing, which expands the upper jaw, the palate, and also the tongue posture, so the tongue to the roof of the mouth. Because when a child is born, their palate is soft and malleable. And so when the tongue steals upward and backwards back to the soft palate, which is the motion that breastfeeding should teach a child, then what happens is that the palate expands and the jaw expands to fit the teeth.

Now, when you get these functional issues, the child begins to learn and begins to survive in a way that, you know, basically is taught to do because it's got a little jaw, it's got an underdeveloped palate, which we'll talk about, but then it starts to create functional habits that then begin to form potentially a jaw that doesn't fit teeth. So, we begin to get these issues that start to stack onto each other right from when teeth begin to erupt. And so this continues right through to when the child, you know, has the full eruption of their pediatric teeth, which is, you know, roughly about 3 years of age. And then between 3 to 6, you start to get the transition of the adult teeth to come through. And this is when we really start to see, hey, this child doesn't have enough space for their adult teeth.

And so in all of these stages, there are intervening factors that parents can be both identifying and then starting to get their child, you know, piece by piece to remove the risk factors that slow down the jaw growth. So, it's a really detailed, but also a really kind of, you know, interactional way that parents can kind of take on their own child's growth and development.

Katie: I know that that's in and of itself enough information to fill books, but can you give us some kind of overview of by different age some things parents can be aware of and start to look out for, and then we can also talk about solutions by age?

Dr. Lin: Yeah, sure. Absolutely. Something that's not really taught to parents especially, is when teeth are up for a start, right? And so as we said, so the first teeth, you know, the lower anterior incisors begin to erupt

roughly between three to six months, kids are different. And then so you start to get the lower teeth beginning to cut. And then roughly between 12 to 18 months, you have 4 upper incisors and 2 to 4 lower incisors. So, you got the front teeth starting to erupt, and then you'll begin to get the first molar.

So, once that first molar erupts around 12 months or so, what happens is the child begins to start to chew on the back teeth. So, they begin to...the ability to be able to crush food. And so when we introduce solids, which is at six months, that's when a child needs to start to create that proprioceptive message through the jaw and the brain to begin to tell the teeth and the jaw to, hey, you need to crush and grind foods, just like going to the gym, exercising a joint. Is that the jaw bone needs to strengthen and the teeth need to send those messages to the brain to tell the jaw to grow.

So, as a child begins to say that they are bottle or breastfeeding, as they begin to...I call it weaning because it's a slow weaning process, but as you begin to introduce solids to a child, it should start to give this proprioceptive feedback. So, we started with, like, a puree form or eggs and breast milk, basically introduction with, you know, lunch in terms of like kefir and, like, a soft avocado, but then a pureed meat. But as they're going through, as they're getting used, as their guts are getting used to this baby-led weaning process, then what we should be doing is to start to increase the toughness of the food. So, to start to give them, you know, the raw carrots or the bones to chew on, you know, once they start to get those teeth at one so that they're developing this chewing, this feedback because otherwise, they won't learn to chew and swallow properly as they need to.

And roughly by about, you know, 2, they should be, you know, quite competent in chewing and swallowing. We see a lot of kids with early feeding issues, and these are the first signs that they haven't quite, you know, developed that strength, and often it's the confidence to swallow, you know, with something a little bit more solid at the back of the throat, a lot of parents battle with that. So, earlier on, 6 to 12 months, that's where we should be introducing.

Now, as we get a little bit older between 2 to 3, we start to see the canines erupt and they'll have the first molar. And then roughly around 3, they'll start to get their second molar. And that's when the pediatric phase is set. Because when the second molar sets in, it's the hearth of the upper and lower jaw that's set, they've got a lot more chewing capacity.

So, at these ages between roughly 12 months to roughly around 36 months or so, a child becomes like a little human. And when they've got this dentition, they really should be removing a lot of the habits that were potentially around in the first maybe 6 to 12 months, the pacifier habits, those sucking habits, the chewing habits because it affects the connection and the messages between these upper and lower teeth. So, pacifiers and sucking habits at roughly these ages can interfere. So, for instance, if you've seen a child that bites their front teeth together and they don't meet, and the tongue comes forward, that's called an anterior open bite.

And that's when often you get a thumb-sucking habit through the night because the teeth don't meet because the thumb is occupying that area between the teeth there. And the teeth just splay forward, and then the child will bite and the teeth will splay forward and not meet. And so that's one of the first signs that the upper and lower jaw aren't meeting in the relationship that they really need to be. And so habits like thumb-sucking or pacifiers will affect this. So, between, you know, 6 months to roughly 3 years, we should be trying to remove that, trying to get the child independent on solids, which is a big ask in itself, you know, cause we know some kids are very picky eaters, but it really should be on parents' minds that, hey, this is the periods that my child needs to be learning this.

And if there's an issue, that's when professional help, you know, can come in. You know, can we identify a bite, for instance, that is not helping a child chew, and can we do something to correct? So, till about 3 to 4, you know, we have this pediatric growth period where the upper and lower jaw is set. Often you don't see crooked teeth in these age groups, but sometimes you do. And so this is where a parent can start to identify, "Hey, has my child's jaw relationship formed the way that it needs to in order to start, you know, allowing adult teeth to come in?" And that's where really a child's teeth today...well, today we don't see it so much, but traditionally, you see in these age groups, you have gaps between the teeth, and this is called primate spacing.

And, you know, it's roughly a 1 to 2-mill gap between the kid's teeth. And the reason is the kid's teeth is nearly a third of the size of adult teeth, and what happens is that when the adult teeth are up, there's not enough space. So, if you see that all your kid's teeth are tightly fit together, it looks great when they smile, it looks great in photos, there's likely going to be a space issue when the child becomes 5 and 6 when the teeth start to fall out.

And then what often we see is that the lower incisors fall out, and then you see these big adult incisors popping through without enough space, and they'll sometimes be crooked. They'll sometimes be, you know, a little bit tipped to the cheek or tipped to the tongue. And sometimes you'll see that the teeth won't actually fall out at all. You'll actually see the adult tooth erupt behind the kid's tooth, and that's called ectopic eruption. And that's where the adult tooth hasn't been able to push the child's tooth out correctly, and it's erupted in a way that is, you know, unideal because, you know, it doesn't have enough space. So, you start to see these ectopic eruptions, or you see misaligned adult teeth, that's a warning sign that there's a space issue. And that's one of the primaries where we can start to intervene and to start to identify, "Hey, can we get this child's jaw to grow?"

Katie: And it sounds like that early feeding and mouth posture and tongue posture are very important to the degree that we can nurture that in babies, which, of course, are a little bit difficult to get to do what you want sometimes. But what can parents do if they're starting to already see this, like, if intervention is gonna be necessary? I know when I was that age, braces were the option and I had the gamut of braces and headgear and that whole thing that I definitely would not wish on my kids. So, what are some of the intervention options now that adjust the jaw and not just the teeth?

Dr. Lin: Yeah, that's right. So, with the baby, for instance, as you said, tongue posture is very important. So, we've got an 18-month-old now, and actually she's got a sucking habit that we're trying to get her... I was just battling her this morning with her nighttime comforter. She's, you know, hell-bent on having it in her mouth. And our second daughter actually, she had that habit and she relieved it herself. It was no issue. But this daughter seems to be a little bit more kind of stubborn to keep it. Yeah. Removing those habits are really important.

So, allowing the child to be aware of tongue posture is a really important start. And this is a realm called orofacial myofunctional therapy, where we begin to teach the child the connection between the tongue and the palate. And the feeding history is important in that, so if they're breast or bottle-fed, you know, how the child has learned to interface that early feeding year. So, breastfeeding should teach the child to seal the tongue to the roof of the mouth. But the reality is, you know, a lot of kids when you go back into the history is that they weren't the best breastfeeders or there were issues. You know, sometimes there were noises or they were compensatory in the way they were extracting milk from the breast.

And I see a lot of kids that still do breastfeed with these tongue posture issues and narrow upper palates. So, if we look at a child, say between, you know, 18 months to 4 years, the things that parents can be looking out

for is, you know, what's a child doing when they're watching TV? So, what's their lip posture doing? Do they see the child's mouth opening? Can you hear them breathing when they're watching television or concentrating on something? What are they doing when they're sleeping? So, is the mouth flailing open when they sleep? Is there loud, noisy breathing? Are they snoring? Are they restless?

So, a lot of the symptoms of bad breathing and poor oral posture show up quite obviously during sleep. And this is when a child is beginning to...you know, as they're going to the deep sleep periods, their mouth is relaxing and the tongue should stay sealed to the roof of the mouth. But if it doesn't, the child will breathe through the mouth. And what happens is you can get snoring, you can get teeth grinding. And so if a parent is picking these things up early on, so if a child mouth-breathes at night, if they're waking up with a dry mouth, if they don't sleep well, the kids that don't sleep well often have an underlying sleep breathing issue. It's often due to an oral posture problem that has kind of flowed them into mouth-breathing at night.

And then it can become snoring, it can become sleep apnea, which pediatric sleep apnea is a very big issue now. That's when we know that the child needs to be seen by a professional because, you know, the parent can go through the processes of trying to teach the child to breathe through the nose, but there are often barriers between these age groups that are hard to treat. And so they are, for instance, adenoids and tonsils. So, swollen adenoids and tonsils will stop a child breathing through the nose, or will make it very difficult for a child during sleep to breathe through the nose. That's where an airway-focused dentist, or GP, or ear, nose, and throat specialist can really help to potentially identify, is there a blockage that can be removed to help the child breathe through the nose through the night because this will really help them during the development period?

So, those kind of interventions are important. In general, I've learned that cleaning the child's nose in early periods is probably far more important than cleaning their teeth. So, from day naught, you know, getting warm washer and washing out the child's nose and using, you know, the nose clearing suction devices early on. Whenever a child is congested, parents should be right on top of getting that cleared as soon as possible. Because in a couple of days...if you watch a child when they have a cold, you know, and a couple of days of blockages, and when they're breathing through the mouth, they will begin to form that habit. And that's how a child becomes a mouth breather, is that they have a blockage event and then what happens is they never retrain that.

And then so if a mother doesn't or a father...we don't retrain the child, then they don't learn to breathe through the nose again. So, clearing that. So we've used, you know, essential oils during sleep and clearing the nose as best as we can while a child is sick to help them get through that period alongside with all the immune support, it helps them get through that period and then breathe through the nose more efficiently after a couple of days instead of taking on that mouth breathing habit.

So, in those early periods, up until about 5, it really is the diligence to teach a child to seal the tongue to the roof of the mouth, and that's tongue clicks, so face-to-face with a baby. So, showing tongue seal, which is they watch, they're trained to watch that, and they will make those noises, but you teach them to click the tongue and that's orofacial myology right there. If they seal the tongue up, that's what we want them to do. And that's what will help them to, you know, grow that palate. And making sure that they can breathe through the nose as much as possible.

During feeding, it's really important that they sit up straight and, you know, chew with the lips closed where possible. Because if their lips are closed, they're breathing through the nose and they're swallowing, all of that is happening in synchrony, instead of, you know, when the kids are loud and they're kind of, like, noisy-

breathing while they're trying to eat, you know, that's a sign they can't breathe through the nose very well. So, early on those habits can start to tip them out. And if we can't get them to do that, then it really does, you know, suggest that they might need an examination in that area.

One other area is slow speech or sound issues. So, if the child has an open bite or a high palate, for instance, which is really, you know, very common in kids today, it's difficult to make certain sounds, you know, S's and T's and so forth. If a child is a bit delayed or they're struggling with certain sounds, it might be a sign that they have an orofacial myology issue that they need to potentially be corrected during, you know, these early phases.

Katie: That makes so much sense. And I feel like mouth breathing is something that has been talked about more in adults lately. It seems like we're starting to become aware that there are problems with mouth breathing. I know a lot of people are into mouth-taping now. So, I guess kind of two-part question is, first, what if for adults who are listening, they're resonating with some of these symptoms and thinking, oh, my jaw is probably not properly formed, is all hope lost now that I'm an adult or there's still things that can help? And/or as a kind of peripheral question to that, what do you think of mouth-taping to encourage nasal breathing at night?

Dr. Lin: Yeah. So, I mean, like, just a straight-up answer to that question is I love mouth-taping, you know, for sleep. In my own journey, that's something that I do every night now because, you know, it completely changes your sleep when you divert from nasal to mouth breathing. And then the reality of the situation is that, you know, we often see parents bringing in kids where they're like, hey, my kid's, you know, not sleeping well, or they've got these jaw and teeth development issues, or they're not speaking well, but then we go through all the risks and then all of a sudden they say, "Hey, this is me when I was young and I had braces, and then, you know, this is obviously not correct." And then we find that there is an underlying, sometimes severe or sometimes a little bit silent, sleep disorder happening in the adult and it is very common. There's currently 1 billion people on the planet with sleep apnea. That's the most severe end of that spectrum.

Now, upper airway resistance syndrome is the less severe, the less diagnosed form of that sleep disorder. And that's where we have this active sympathetic drive during sleep. So, the jaw, one of the biggest symptoms is teeth grinding, so adults that grind their teeth. And, you know, parents out there, you know, we know we don't sleep very well. So, if you don't have great sleep already and then you're reducing your sleep through the challenge of, you know, raising infants, then you are going to have a very, very hard time regulating your own energy and sleep moving forward. And that's something we see so often in the clinic is that parents that are just wrecked with sleep because they've been dealing with their own children's issues.

And then these underlying problems in themselves have become an issue because it's usually between, you know, the ages of say, you know, maybe 35 to 45 that they start to become more obvious. Between 20 and 30, 35, you don't really notice, you know, a snoring and sleep disorder. But it starts to build up as your life becomes a bit more serious in your 30s and 40s and so forth as you work harder, you have kids, and so forth. The energy that you have to, you know, exude in these other areas, really shows that your sleep is not as optimal as it needs to be. So, mouth-taping is a great way to do that.

Now a lot of people can't, you know, mouth-tape themselves, so that's a sign that you cannot tolerate nasal breathing. And there's two ways to go about this. One is to train yourself physically through soft tissue posture, which is the tongue and closed lip posture to tolerate nasal breathing. And that's one muscular route.

The other route is the biochemical route, which is slowing down your breath and learning to use the respiratory muscles deeply. So, learning diaphragmatic breathing, which might be yoga, might be to partake breathing, you know, might be breathwork or breath training that helps you to understand how to use the breathing muscles because you have to breathe correctly in the daytime in order to breathe correctly at nighttime. So, if there's a breathing issue at night, there is always a breathing issue in the day. And so it means that you have to spend some time to reprogram your breathing.

And so you can do this by soft muscle training. So, tongue posture, you know, doing yoga postures where you're doing breath exercise and deepening the breath and so forth. But if you still can't do that, if you still can't sleep with a tape on, that's where you may need to have some kind of architectural or certain, you know, nasopharyngeal issue looked at. And so that's either a dental examination, where we can look at the width of your palate or we can look at your bite. Is there a cross-bite? Is your orthodontic alignment, you know, blocking your airway? You can get a cone beam 3D scan that shows actually the volume of your airway, you know, at the back of the throat, at the back of the nose. An ENT assessment, you know, many people have deviated septums. If you didn't develop correctly orthodontically, you almost certainly have a deviated septum in the nose.

And so that's something that I did last year. I had my right side corrected because it was blocked from a sporting injury and it's helped my breathing significantly. But most parents just don't know that that's a thing. So, if you can't tolerate these things is a sign that perhaps you need to see a surgeon or you need to see an airway-focused dentist to begin to look at, you know, can we change the structure? And yes, we can expand adults or, you know, we can do surgical interventions with adults, or they can do myofunctional orthodontics, which is training the jaw and breathing system to breathe through the nose at night.

It's just a lot harder. And so it's a bit of a harder road for adults and the results are a bit more subtle, but the investment into better sleep is by far, you know, worth it. And so if any adults out there are having these symptoms, I would highly recommend them looking into at least doing the training themselves to see if it's a problem for them.

Katie: Yeah, absolutely. When you think about we spend roughly a third of our life sleeping, it seems like anything we do that improves sleep and that doesn't take effort once it's done is gonna have a payoff in every area of life.

This episode is brought to you by Four Sigmatic, the company that first introduced me to functional and medicinal mushrooms and whose products I've been using for almost a decade. Mushrooms are absolutely fascinating, being genetically closer to humans than to plants. The largest organism in the world is a mushroom and they allow trees and plants to talk to each other using something called mycorrhizal networks. Many types of mushrooms are also well studied for the benefits to humans, and widely used in many ancient medicinal traditions and cultures. Researchers has found that mushrooms have high amounts of ergothioneine and glutathione, both important antioxidants, that help fight age-related decline. I love eating culinary mushrooms but sometimes it can be hard to work them into my everyday diet, and specific mushrooms have additional more targeted benefits. That's why I love Four Sigmatic products. They have a wide variety of beverages that incorporate these amazing superfood mushrooms and that taste amazing. On a typical day, I'll drink a cup of their mushroom infused coffee or matcha with ingredients like Lion's mane for focus or cordyceps for overall health. I also love winding down with a cup of their Reishi elixir, which helps me fall asleep easily and get more restorative deep sleep. I especially love their packets on the go because they are so easy to throw in my purse or my bag when I travel, and I'll often just order a cup of hot water on the go and make some Lion's Mane coffee on a plane. I also love mixing a packet of their coffee or matcha into a protein

drink on the go for a protein-packed iced latte option. Speaking of protein, they have the only plant-based protein I like, with 7 functional mushrooms and adaptogens and the flavor is great. Check out all of their products at [foursigmatic.com/wellnessmama](https://foursigmatic.com/wellnessmama) and use the code `wellnessmama` for a discount!

This episode is brought to you by Wellnesse. That's wellness with an e on the end, my line of non-toxic, family focused personal care products including haircare, oral care and deodorant. At my house, kids toothbrushes and kids strawberry toothpaste are the favorites. The toothbrushes come in a 3-pack of fun colors, which makes it easy for my kids to know which brush is theirs. The strawberry toothpaste tastes great so there aren't any fights about tooth brushing, and I love that it's formulated around hydroxyapatite, a naturally occurring mineral found in tooth enamel. All of our toothpastes use only EWG verified safe ingredients, are free of toxins, and are packed with ingredients that naturally support the oral microbiome for stronger, healthier, whiter teeth naturally. Check out these and all of our products at [wellnesse.com](https://wellnesse.com).

It definitely sounds as well like the earlier the better with all of these, which is why with your work, it's so important for parents to have this knowledge, the younger the better with their kids, and be able to watch for these things in babies. What about as kids start hitting the age where they would typically be recommended braces? Can braces actually be helpful in this, or are there better alternatives that could be more jaw-focused, or what do you recommend with kids who come in with already some misalignment of their teeth?

Dr. Lin: Yes. So, we kinda mentioned up to 6 or 7. So, between 7 and 12 you have this really big growth phase. That's when all the kid's teeth are falling out and you have all the adult teeth plummeting into the mouth. And at 12, you have the adult canines finalizing the jaw arch, and that's where you start to see the kids with the canines that maybe stick out here or they're, you know, misaligned, or you have misaligned front teeth or the bite that sits a long way back, the buck-tooth child or you have the recessive upper jaw where the upper jaw sits forward. And these are the diagnosis that orthodontists, you know, look at and say, "Hey, you need these braces to fix these issues."

Now, the idea of myofunctional orthodontics is to address the cause and the muscle factors and the breathing factors that cause the orthodontic problem in the first place. And so braces can change the alignment of the teeth, but it may not affect the underlying issue that cause them in the first place. And this is where sometimes children or parents will be suggested to have extractions and then braces. And so nearly in up to 90%, 95% of cases, I would say we should not be extracting adult teeth to align the orthodontic arch. We should be looking at growing the jaw.

So, once you get to 11 and 12, this all begins to slow down. So, between 7 and 12, the child's extremely malleable, myofunctional orthodontics is absolutely remarkable. We have an amazing amount of cases where you see the palate just go from this tiny, you know, 30-mill intermolar width to up to 40-mill, 45-mill in barely, you know, 2 years. And then you see the huge change in this kid's face. Now, at 11 and 12, we can still do this treatment, we can still expand the adolescent jaw. If there is a particularly difficult, you know, orthodontic issue like an impacted tooth or a tooth that is misaligned significantly, where there's roughly more than 3-mill to 4-mill of space needed, it's likely that myofunctional ortho won't correct that, but it will severely lessen the amount of alignment needed potentially later with Invisalign or braces.

So, the idea that we put braces and Invisalign on is great. It's the most effective way to align teeth, but if we do it without treating the underlying causes, then we're potentially, you know, pushing ourselves into issues.

And, you know, there's a lot of people out there with orthodontic regression now where you have misalignment of teeth after you have orthodontics. But the other thing that people don't talk about is the jaw issues and the sleep issues and the craniofacial pain, the headaches, and migraine issues that do flow on in people with history of orthodontic problems.

Even if a child is 11 or 12, there is value, in my opinion, to be correcting these issues and widening as much as we can. And, you know, a child at 11, 12 can still significantly widen their palate. You know, we can do things like palate expanders and even implant retain and expanders that can get up to 8-mill in an adolescent that grows...you know, they still grow quickly, but not as quickly as a 7 to 12 age. So, I would say that, you know, identifying the problems and finding a practitioner that deals in this way is going to give the child a more lifelong result rather than just, you know, aligning the teeth in that sense.

Katie: That makes sense. And you mentioned so many of the sleep connections here, and I know from reading some of your stuff before, there also seems to be a food connection. We talked about the in-utero food connection for the mom and early development with nutrient deficiencies, but is there also a connection between poor sleepers at other ages and what they're eating?

Dr. Lin: Yeah. I think this is one of the big areas that the parents aren't really being told is that kids don't sleep well, they are going through the whole neurohormonal endocrine issue of not releasing melatonin in the brain themselves. And we're talking here about a physical issue where the autonomic nervous system is controlled by breathing. So, when a child's a bad breather, you know, they're not gonna sleep well because the autonomic nervous system doesn't get into parasympathetic rest and digest easily.

But the other factor to that is, you know, how are we feeding this system? What are the factors that allow a child to release melatonin efficiently? And I've found that, you know, a lot of the foods, the modern foods that we know that cause tooth decay, crooked teeth, and so forth, also, you know, relate to how a child sleeps as well. So, vitamin D we know is very, very important for sleep now. We know that in sleep apnea, for instance, we see a high connection between vitamin D deficiency and sleep apnea.

So, when a child isn't breathing well, they're bottoming out their vitamin D. And so there are hundreds of receptors on the brain stem for vitamin D. And so that is basically produced when a child is out in the sun or eating a high-fat animal-based meal that is rich in fat-soluble vitamins. And then the brain uses to help convert serotonin, which is the daytime neurohormone to melatonin, which is the nighttime neurotransmitter that governs everything during sleep.

So, when we're vitamin D deficient and when kids are vitamin D deficient, they are going to be at risk of sleep issues and, you know, they're not going to as efficiently release these neuro hormones as they need.

The other big factor is blood sugars. And so when we are feeding kids high carbohydrate sugar-laden foods early on in life, and when they're going through insulin roller coasters and blood sugar roller coasters, their sleep is going to be severely disrupted because we know the connection between insulin-like growth factor and all of these connections between, one, testosterone, which is one of the big growth factors during sleep. And then how our body's regulating all these neurohormones so that the child can enter into all of the five stages of sleep. So, sugar and lack of vitamin D are I think the two big parts of the modern diet, especially in children because when we feed kids this high-sugar, low-fat food, grains, sugars, vegetable oils, it pushes them into a state that does not yield good sleep.

And so right from day dot, we, for instance, I don't think all parents need to necessarily do this, but we didn't give our kids fruit. And the reason being is that I was concerned with the amount of fructose that a child can

get from a modern-day apple or banana and so forth, but more so, the way they develop this palate for sweet things. I wanted them to recognize the nutritious taste of things like eggs and animal foods and so forth, and not crave that sweet food that you get with fruit. So, they didn't have any fruits, grains, or added sugars, or anything like that. And they all sleep very well.

I'm not saying this is absolutely what every parent has to do, but in my view, the kids that don't sleep well, we always find the diet history and the diet patterns where there's a lot of carbohydrates, a lot of cravings. We know that bad sleep forms cravings with kids that want these high-carbohydrate foods. And I think that that connection, whilst it can be hard for some kids to come down off those foods will help them sleep better, and for parents to understand there is a connection between what my child eats and how they sleep and the quality of their sleep as well.

Katie: Yeah. It makes sense that it's all so interconnected and it would seem like as such, like, approaching any of these factors is gonna help in the other areas as well. So, like, improving their nutrition will help their sleep, will help their jaw. Improving their jaw and their mouth breathing will help their nutrition because they will hopefully crave healthier foods, etc. But I love that you present this as like a very holistic approach and it's so helpful, I think, to hear the different by milestones and by age what to look for. And I'm even, you know, making mental notes for my own kids as they get older.

And also to know, like, not all braces are bad all the time, but that's not necessarily the best starting point. And it's also very much helpful to know, even for adults, if we're already seeing these patterns in adults and even if we're all, you know, "full grown," there are still things that can be helpful. I think the conversation around sleep and mouth breathing is a really, really important one. As you said, I didn't realize it was that high, a billion people in the world with sleep apnea, but it seems like this is something drastically on the rise as all of these things are. It's like we're seeing an increase and you must see this in practice every day, an increase in all of these issues kind of across the board.

Dr. Lin: Absolutely. You know, as I said at the start, in our practice, because we've been focusing on this for a while, we're beginning to see...you know, the parents are beginning to switch on to the fact that, hey, something's not quite right with how my child is growing and developing, and there's something there in their mouth that isn't quite right. And, you know, it's great that, you know, I've had parents that have come and fully diagnosed their kid and they opened their narrow palate. They've done the whole thing because they've done their own research basically, which is really kind of nice to know. And then basically, the treatment is so much easier then because we've done 50% of the work, but the real kind of message there is that there is this huge problem in our child's life where we as a population now do not grow jaws that is adequate to fit our airway and sleep.

And so what happens is that, you know, we have these kids that are really battling on a number of fronts. It's sleep, it's nutrition, it's the postural factors of mouth breathing. You know, you see a lot of kids now on devices with their head tip forward and they're breathing through the mouth, that does not develop their jaw the way it needs to happen. And they suffer in many different ways, ADHD medicines and so forth. All these issues that kids are suffering with, adenoids and tonsil issues, which is an underlying respiratory and breathing issue, immune problem. So, they're all related to a poorly or slowly growing craniofacial system, which is no one's fault, by the way. You know, I've also had parents that have been...they've been on this nearly from day naught, they've been eating nutritious traditional-based, animal-based diets and they still have these kids sometimes with dental decay and they're just like pulling their hair out.

And the way I kind of say it to them too is that, well, we have to remember we're in a generational problem now. Often with kids' teeth, it will become a thing of the past and all that work that that parent did is going to...it will be fixed when they're adult. You're gonna have a beautiful adult dentition in that child. But there is still things working through and they're a little bit dejected in that sense. But, you know, I think we have to see this as a much bigger problem and that all parents should be kind of seeing their kid in a much bigger picture that, hey, this is something that we're trying to fix for their grandchildren and like the investment we do in their sleep and breathing.

And the other thing too is teaching the children. I love hearing kids talk these things back to us and tell us about tongue posture and eating nutritious, fat-filled foods and the way they're improving their sleep and wearing their myofunctional ortho guards, and how their face is changing. That's a child that's gonna teach that to their child and will teach it to their child. So, I'm hoping that this becomes something that we can really embed into a societal conversation instead of just maybe fixing child by child.

Katie: I love that. I've said that in relation to lots of areas of raising children is they understand so much so early and you're in the very early phases of seeing that every day, how much they learn and understand. And I think when we put in the work to educate them, whether it be about nutrition, whether it be about different aspects of their own education, they're capable of understanding so much.

And to your point, when it comes from that internal motivation and they understand the reasons, the effects seem much longer lasting and we know that in education as well, they're more likely to remember it when they have an interest in learning it and they're excited about it. So, I love that you bring the kids into that as well. And I know there's so much more we could cover on this topic and endless topics within the realm of dental health, but where can people keep learning from you online?

Dr. Lin: Yeah, so they can find me at [www.drstevenlin.com](http://www.drstevenlin.com), or on social medias @DrStevenLin. Yeah. And so, you know, we really try to push the idea forward of functional dentistry and understanding the root causes of dental medicine, instead of just treating the, you know, the results of that. And so it's something that I think is really powerful for both parents, but also for adults too. There's so much learning that I've done just going through this. I think you and I are pretty similar in the sense that we always implement things for ourselves before for our children, and it's just such a powerful way for a family to grow and heal together.

Katie: Absolutely. And I've always said what we model is more powerful than even what we say. And so when they see us doing it, they're more likely to want to do it as well. I know you have so many resources on your website, I'll make sure that is linked in the show notes as well as your book. You just are such a wealth of knowledge and I'm so excited and encouraged to see people like you really on the forefront of this kind of holistic oral care, jaw health, and really looking at these things. I feel like this was a conversation we ignored for too long and it's really exciting to see people like you really working to fix it. And a couple of last questions I love to ask at the end of interviews, the first being if there is a book or number of books that have really profoundly impacted your life, and if so, what they are and why?

Dr. Lin: Well, "Nutrition and Physical Degeneration" was a big one, but we kind of talked about that, but actually, Daniel Kahneman, "Thinking, Fast and Slow" was probably, I look back now as one of the more influential, you know, books in my life. Mainly because it was a strategy of thinking and a way to look at problems and not to be kind of tied down by biases. So, you know, one thing about, you know, medical problems is that they are so riddled in bias, and being able to kind of think differently behind problems and not just what you are presented with is something that really kind of shaped my thinking, I think, with Daniel Kahneman's "Thinking, Fast and Slow."

Katie: I love it. I will link to those as well. And lastly, any parting advice for the listeners today that could be related to the things we've talked about or unrelated?

Dr. Lin: Yeah. Look, I mean, with parents, you know, it's difficult, you know, raising kids. Everyone knows that kids are difficult. I would just say that everything... I find that a lot of people that come into the clinic, they're sometimes a little bit overwhelmed and sometimes they're a little bit guilty as well that they perhaps didn't know this before. But you only know what you know, and everything you do in your child's life is going to have an impact, and we are all learning in this whole kind of raising kids and trying to teach our next generation to be better.

And I would try to tell them not to get yourself down if you've missed something or if there's something that you feel that your child has perhaps been a little bit behind on, but the positive impact of learning that now is gonna have a far more positive experience than being tied down in the negative of it. So, don't lose hope, and that ultimately, kids are highly resilient and they will come through this. And as long as, you know, everyone keeps pushing forward, this is going to be hopefully a problem that we solve.

Katie: I think that's a perfect place to wrap up. Thank you so much for your time and for sharing today and for being flexible on scheduling with an ocean in between us. I have learned a lot, as I always do from you. And you, guys, please check out the links in the show notes to keep learning from Dr. Steven. But thank you so much for being here.

Dr. Lin: Thanks, Katie. Thanks so much for having me.

Katie: And thanks as always to all of you for sharing your most valuable resources, your time, your energy, and your attention with us today. We're both so grateful that you did, and I hope that you will join me again on the next episode of the "Wellness Mama Podcast."

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