

Dr. Ron Ehrlich: Hello and welcome to “Unstress”. My name is Dr. Ron Ehrlich. Now in a recent episode, I spoke to the author of the book “Jaws - The Story Of A Hidden Epidemic”, world-famous environmental biologists and ecologist, Professor Paul R. Ehrlich. My guest today is the co-author of that book Dr. Sandra Kahn.

Now Sandra is a specialist orthodontist as well as a physical anthropologist. The hidden epidemic is something that affects almost everyone to some degree in our modern world. That is not enough room for all of the 32 teeth we have evolved to have over millions of years.

Now if we suddenly in evolutionary terms say over a period of a few thousand years or even a hundred years, didn't have enough room for all five fingers on our hands I'm sure we would not be as blasé about it. We'd be asking “What the hell's going on? No, I do not want my finger removed”. Even the dental profession has come to accept narrow jaws and crowded teeth as a normal part of life without very much significance. Well, it is significant as you will hear.

In many recent episodes, we've explored the importance of breathing well through your nose not your mouth and we've discussed the importance of getting a consistently good night's sleep. That's a function of quantity. Getting enough sleep and quality breathing well while you're asleep. So, not having enough room for your teeth means narrow jaws and that means narrow upper airways and that is the hidden epidemic going on right underneath our noses. I hope you enjoy this conversation I had with Dr. Sandra Kahn.

Welcome to the show Sandra.

Dr. Sandra Kahn: Thank you very much, thank you for having me.

Dr. Ron Ehrlich: I did speak to Paul your co-author you've written this wonderful book “Jaws - The story of a hidden epidemic” and I loved it, it's a beautifully written book very accessible and some great references and that, but I want to talk about that but tell me, I want to hear a little bit about yourself because you're an orthodontist.

Dr. Sandra Kahn: Yes, I went to dental school and then I got very interested in growth and development or development of the cranium. So, I was always interested in how we were developing then I became an orthodontist not just to straighten teeth, but I just wanted to really understand how the face developed and then after orthodontics, I did work in Physical Anthropology which I found incredibly interesting. And one thing led to another and I realized that you know, just like you've read in the book, that the crooked teeth are really a consequence of the just not having developed to their genetic potential and that's why the teeth don't fit.

Dr. Ron Ehrlich: Now when you were studying orthodontics because you went through dental school and then you did your specialty of the orthodontics, what was the standard you

know because the question is why is it so and so why was it thought in dental school in orthodontics specialties that teeth are crooked?

Dr. Sandra Kahn: Yeah, the whole health area it's not that focused on the reasons why things are happening. In medicine is a little bit better easier to find cause and effect but in dentistry, dentistry for some reason they became separate from medicine and Paul always laughs when he said you know, who decided the mouth didn't belong in the rest of the body. And you know I've done work and I had lived in Spain in Europe and in Europe dentistry was a specialty of Medicine. You have to study medicine first and then you can specialize in endodontology and then in the US and Mexico where I trained originally the specialty is more mechanical. We tend to hit be more you know dealing with mechanics. So, if you had a broken tooth we just fix that tooth mechanically. And of course, we need to know how the body works but we are more focused on you know something that we consider external to the body just like you know, maybe a hair cutter, cutting your hair or doing your nails we were doing the teeth.

And you know, it's a specialty that goes in and out into the medical field. So, we always looked at crooked teeth as a symptom that we could just do something about. And you know a hundred years ago that was the case because we were not having as much of an issue with the habits and processed foods and all the issues that we talked about in the book. So, a hundred years ago if you had crooked teeth and you fixed them they pretty much stayed because we had good habits, good respiration, we were walking a lot you know we were exercising our muscles everywhere. And so, we had different rules on how to behave in when we were eating. Chewing more, chewing with our mouth closed.

So, as we change the last 100 years it's just crooked teeth not only became more prevalent, but we've developed them helped to maintain them straight.

Dr. Ron Ehrlich: Now you also mentioned that you spend time, or you are also a physical anthropologist and considering that often all people find is a tooth that seems like a perfect synergy, doesn't it really? To have your dental training your orthodontic training to be an anthropologist as well. What were some of the things that you know... That's a great combination. I've never, never really thought that.

Dr. Sandra Kahn: Well, my original work that's polished was done at the University of Berkeley and I've worked with an anthropologist Gary Richards and the original work that we did had to do with the aging of immature skulls. So, there was a sample of children that you know, anthropology called sample so we very you know, but some of them were hundreds of years disease and they didn't know how old they were. So, he invited me to work with him so that we could age these skulls and we could say you know this was a seven-year-old, this was a 10-year-old, this was you know four-year-old and that's all done through looking at the development of the teeth. So, there's definitely an overlap.

Dr. Ron Ehrlich: Now the book "Jaws - The Story Of The Hidden Epidemic" tell a listener for those that haven't read it yet what that hidden silent epidemic is?

Dr. Sandra Kahn: Well, the epidemic really, it's three things. It's crooked teeth. You know you can see everywhere that more and more people are having to use braces, it's also the faces are falling back and down. You can see that you know that the prominent jaws are not as common. And by prominent, I mean like if you look at actor's famous people like Angelina Jolie or you know, very good-looking people tend to have this, the lower part of the face kind of sticking out more. And if you look around you'll see that a lot of people their jaws look like they're almost melted back. And there's definitely we've looked at a lot of research and there's definitely it's more common that this is happening, and you know this is coming from also hang your mouth open and so the jaws are growing back and down. And the third thing that we're seeing as part of that epidemic is the sleep problems. And the sleep problems can be from snoring which is really when the tongue kind of vibrates. If you go to sleep at night and your tongue vibrates your snoring and you have to open your mouth to get the air through your throat. And the progression of snoring ends up in what we call sleep apnoea.

Most people lay people are very familiar with this condition because I don't think I've met anyone in any city today that doesn't have either a relative or a friend or somebody that they know that has to sleep with a mask to be able to breathe that night because sleep apnoea is when you stop your breathing at night.

Dr. Ron Ehrlich: I mean people just don't make that connection, do they? Between the size of their mouth and the size of their airway but it's profound.

Dr. Sandra Kahn: It's very profound because the effects, what we've looked into the research and everything that's associated with you know, having a difficult sleep or difficult breathing is a lot of ailments that are so prevalent in our society which is it's scary. If you want me to repeat things that Paul usually talks about.

Dr. Ron Ehrlich: No, no go ahead. We talked about environmental issues and politics with Paul. I knew I was going to be talking to you, so I thought I'd leave the dental side to you.

Dr. Sandra Kahn: Okay because for me the connection was meant made earlier in my career and to my patients and my children but when he realizes that okay we're not sleeping well; our sleep is interrupted and that is stress. And the stress is definitely associated with all kinds of things. And for me with children, you think of those all those ADHD and attention problems but you're also looking at all the things that get you to have cancer and heart disease because you're having all that stress at night and that affects also the amount of oxygen which also affects the brain. So, Alzheimer's been already correlated with these sleep issues. Alzheimer, memory problems, depression, even sexual dysfunction has to do with you know the stress that we have because if you imagine when you're sleeping if you have a hard time breathing that's you know, the hours where you supposed to be restful and relaxed are filled with all these stress hormones.

Dr. Ron Ehrlich: Yeah, well it's music to my ears because it's something that this program is actually all about. But I want to go into that in a little more detail I'm just intrigued about how you came together with Paul because his background is environmental and ecology and yours

is dental and when I saw the book written by you both and I just thought” Wow the timing of this is amazing”. How did it come to be like that?

Dr. Sandra Kahn: Well, that's very interesting and that I always like to say that we really have to become broader in our views as scientists. And Paul is interested in the human predicament. Anything that's affecting humanity in a negative way he's you know, incredibly creative and incredibly interested. And we've become more silent in our views especially in science and you know working with the evolutionary biologist was very instrumental for me. And we met socially; we became friends through our conservation work. But when I started telling him about all the stuff that I was uncovering he just become appalled and he really thought that this has, we have to look deeper to see if my just observations were backed up by science. And if it was and there was a lot that you could do. And he deals with issues every day in the environment you know; individual people cannot do much about.

And this is the one thing that you know anybody the individual can change the situation for the children. So, if you realize that this is a problem and you have children and they're younger than ten years old you can actually change this environment for them and help them.

Dr. Ron Ehrlich: So, Sandra let me let me ask you, what do you think about Weston A. Price? I mean he obviously explored this idea of jaw development. How do you think his research sits with what you're talking about?

Dr. Sandra Kahn: Well, it's interesting because he is quite you know unknown in the dental world. The dental world doesn't really acknowledge all his work which is interesting because he was a very traditional dentist and he was the head of the dental of the American Dental Association for almost a decade. So, at some point you know we moved away from his observations but when you start looking at causes you go back and you see that he did a lot of research and a lot of anecdotal evidence was gathered by him about the status, not only of the jaw development but the status of the whole dental and mouth situation in communities that were non-industrialized and lived and ate their traditional diets.

And you know he seems to focus more on the component of the food. The type of foods or the chemistry of the foods and he noticed that all these communities that had more traditional foods and usually they were hunter-gatherer type. So, they had a lot of fruits and vegetables and a lot of animal protein. And you know pretty unprocessed stuff. You know, he talked about you know the communities that drank the milk without pasteurization and you know, there was a lot of just you know, what we would call today farm-to-table, right? But he didn't really look at the consistency of the food which it's interesting because there's not a lot of research Paul and I have been looking trying to find if there's anything that has been written on the toughness of foods.

And one of the things that we're looking at is trying to develop a chewiness chart.

Dr. Ron Ehrlich: An index. An index of how much food needs to be chewed before it should be smaller.

Dr. Sandra Kahn: So, we can recommend, or we can start doing some research and you know, have this the same chewiness of food compared in different individuals. And there's not much around that. That's just something that has plagued the whole health industry because you know there's tons and tons of books and different diets and you know, everybody comes up with a different theory of how we can be healthier but nobody's looking at how we're chewing and how much we're chewing and how challenging those foods are for the facial and chewing muscles.

Dr. Ron Ehrlich: Yeah because I think Weston A Price hypothesis was that this was a nutrient-dense diet and that was what allowed for the physical development of the person. Not just the jaw but of the person. But you and Paul have come up with the idea that consistency was actually a factor that hasn't really been talked about.

Dr. Sandra Kahn: Well it's nice to think that Paul and I came up with it but not really. This really was the brainchild of Dr. John Mayer. He's the first one that I heard and there are lots of followers that have looked into this. But the thing that was surprising was that as a traditional dentist you know, head of the American Dental Association, very conservative he looked at the three things that dentists are worried about. Gum disease, caries or cavities and also you know, malalignment or misalignment or crowding of the teeth. So, those were the three things that he found that were completely absent on this traditional diet, this type of diet.

Dr. Ron Ehrlich: I think part of the problem with Weston A Price was that he also did quite a lot of research on root canal therapies. And it led because of his position and respected nature led to the removal of an awful lot of root canal or infected teeth. And then that somehow, I guess from there emerged the science of endodontics which a whole other specialty. And I think I think his work anthropologically from a decay perspective kind of fell away from the limelight there as did the root canal one. I think that's where he went to right where he seemed to lose his position if you like.

Dr. Sandra Kahn: Well, again that's what happens. We've talked about our relationship Paul and me and having different practitioners working together from very, very different perspectives and that's probably what happened where he was just going through the very traditional dental awareness and very mechanical view of history into practice.

Dr. Ron Ehrlich: One of the things that I think I've said this to you is that what I'm so impressed by in this book that after all of Paul's many years should we say over 60 years of interest in environment and ecology comes up with you know, co-authors this book with you about the jaws which I thought was just amazing. Not only because we share the same names but for the last 40 years I've been sharing a similar interest and to have him come up with that and you of course co-authoring. It was just remarkable. Remarkable that this is now finding the light of day.

Dr. Sandra Kahn: Yeah, well what can I say first about the name I'm jealous because not only Paul and you but also a Nobel Laureate has the same name.

Dr. Ron Ehrlich: Yes, we have a hell of a cross to bear there you know. We've got a lot of the big shoes to fill... big shoes to fill. But it was a great opportunity to talk to Paul and great opportunity to talk to you about it as well.

Dr. Sandra Kahn: No, but Paul is really, really one of the real thinkers of our time. I'm humbled when I talked to him and I realize how the view that he has about what he calls the human predicament. If we had three or four like him, you know humanity would be a lot better.

Dr. Ron Ehrlich: Absolutely, absolutely. Listen, thanks again I just had to had to hear what you had to say about that because it was a kind of a, I know you mentioned it in the book and it was just so good to hear you put that into a perspective.

Dr. Sandra Kahn: It's fantastic that so many people now so many parents and families are now familiar with that and they're incorporating these ideas that make total sense.

Dr. Ron Ehrlich: Yeah and it's an and it is I think the fact that Paul has recognized how important it is reaffirming what I think you and I obviously know and that is that it is a very important part of the human condition.

Dr. Sandra Kahn: Well, "Jaws" the book is just getting incredible comments from thinkers that are not related to our sciences at all. And every day I get an email from Paul or somebody else just telling me how fantastic the book is, and you know, they tell me they can't put it down.

Dr. Ron Ehrlich: When did you start writing it? Well, how long have you been working on the book for?

Dr. Sandra Kahn: Well, you know, I wrote a previous book a very long 400-page book and that took me about 10 years.

Dr. Ron Ehrlich: Right. And what was that called?

Dr. Sandra Kahn: That's called "Let's face it". And I was in the process of doing the translation as you know my first language is not English. It's written in Spanish and I think it's a fantastic book it's more of a consultation book for parents. That took me about 10 years to write. And Paul we were talking he looked at it and you know, I was working on the translation and he said you know, "This is too long. You got to put this in a different format and no more than 100 pages. Condition information has to get out to absolutely everyone". And we decided to do the non-profit work. And it took us about I would say between two to three years to get it done.

Dr. Ron Ehrlich: Yeah, tell me how prevalent now going back to this silent epidemic, narrow jaws how prevalent is it and how significant is it? I mean you mentioned the narrow airway and that but let's say how prevalent it is.

Dr. Sandra Kahn: Well we know that about 80 percent of children in industrial society keep their mouth open at rest. And this is something that we've been looking at what we research is out there, and this is what the articles that are looking at normal children are publishing or they're writing up. So, 80% of the majority of the children in society don't keep their mouths closed. And so, we know that this is one of the initiators of the jobs not growing properly. Because in order to grow properly your muscles have to be strong enough to keep your mouth closed at rest.

And so, the genesis of this whole epidemic is really the children not having the environment that fosters the muscles. So, if you are not breastfeeding and if you're being fed by a bottle when you're not working the muscles from birth. So, those muscles are too weak to keep the mouth closed and then we can add things like living indoors which is you know, there's a lot of allergens so that the nose gets stuffier, so you don't close your mouth and you bypass the nose, the nose has important functions. The nose filters the air, warms it up, moisturizes the air and it also adds anti-bacterial.

So, this starts a spiraling down into you know not being able to close the mouth. And that's why the prevalence we feel it's 80%. Because of the research, we've gathered if 80% of children are having their mouth open and they're having diseases then they're not growing properly. And you know there's a lot of information out there how many people need braces and it's also a very high, high percentage of the population. So, it's extremely prevalent. And the experts in sleep apnea they also give incredible numbers and there's some of them are quoting phrases saying that sleep apnea is going to be the most prevalent disease of industrialized society for the next couple of decades.

Dr. Ron Ehrlich: Yeah and we kind of think of sleep apnoea as stereotypically a middle-aged overweight man you know and beyond. But as you are pointing out it's affecting children as well.

Dr. Sandra Kahn: Yeah, this is my interest because if things are not developing properly we have to and we want to focus on prevention or study prevention how we keep from getting into these problems when we get older. Then we have to look at how the children are growing.

And this was my primary goal writing the book, it was to really inform parents or anybody that has contact with very young children and change those habits early so that the growth is normal. And for normal it just makes sense that normal means every part of our body has the space to develop and we now have accepted as a society that wisdom teeth, the last molars in the arch they're just going to be pulled out and that's not normal. It's very common but it's not normal. That's not the way our species are supposed to develop. We are supposed to have room for all our teeth, not the need to have anything pulled.

So, my goal with a book was to inform parents so that they can you know, foster the habits that will allow the children to develop properly. Their jaws to grow big enough.

Dr. Ron Ehrlich: And what are those habits?

Dr. Sandra Kahn: Well we want to talk about number one hanging them up and you know there's a lot of habits that we're developing with industrialization. Because industrialization really makes things easier, it makes life easier. And biologically and anatomically we are not designed for easy. We know because everybody goes to the gym, right? Or anybody there wants to be healthy, they know that they want to go to the gym and that's not easy. It's always hard to go in and lift those weights and you know do those treadmills or whatever we've known as a society that challenging ourselves is always healthy.

So, the same thing happens with the habits that involve the mouth and the teeth and chewing. We got to challenge ourselves and children need to be challenged, breastfeeding is a challenge. And you know my own mother who's in her 80s she was telling me that she felt bad for her children when she was breastfeeding because she felt that they were suffering. She said they would work so hard, but you know she's 80 so in her time that's what everybody would do. And she says you know you could see them sweat and working hard. So, the muscles are working just like when you go to the gym you're working. And that goes from birth breastfeeding to weening. We've got to ween our kids on challenge challenging foods. We have to not be afraid of them choking because anatomically, physiologically we know that you cannot really choke when you're very young because before you start speaking we're able to swallow and breathe at the same time so we can't give children harder foods as we ween them in the first year of life and we need to give them things that challenge their tongue, their muscles so they learn to work out all these things. And then the muscles will be strong to hold the jaw closed. If we have all these issues with those habits and in addition to that we live indoors we've got a day-care where there's a lot of you know disease and we start getting the stuffy nose, then we're going to spiral into opening the mouth hanging it and it's not the jaws are not going to grow to the size where they're going to be big enough to fit all the teeth.

Dr. Ron Ehrlich: Yeah. So, challenging them with food that makes the jaw work hard?

Dr. Sandra Kahn: Yeah, absolutely. Anything that challenges a child, the cells, the patient will help them develop better. I see it and I don't want to be critical of you know anybody, but I see that children sit at the table and they look at devices right now and they just sit there and eat soft things. You know they make smoothies and hamburgers and macaroni and cheese and thinks about almost pre-chewed. And they're just sitting there and they're not sitting properly, they're not chewing with their mouths closed, they are either talking or looking at their devices and not really paying attention to eating with a certain you know, posture or strength or attention.

We usually teach young children how to chew and we say chew like you mean it. So, concentrate on your chewing, chew hard and the thing that cracks Paul up is that we recommend chewing gum. It might feel like you know one of those bad habits but actually, we need to teach children how to chew with their back teeth because now tempted to nibble with the front teeth and then swallow the food almost whole because it's so processed.

So, all these habits you know there's a series of things that make life easy. So, taking a smoothie of all your vegetables and just sucking it through a straw will make your life easier but if you actually take the kale and you chew it you know 20 times then you keep your teeth



together and you swallow. You know you are actually challenging your muscles on your teeth and you are actually squeezing the glands that put in certain enzymes like into the food, so you start digestion starts in your mouth. If you take that smoothie it could bypass with the mouth it goes directly to the stomach and you're bypassing all those good things from mastication and from chewing with your back teeth.

And so, we need to go back and teach the kids and it's harder because it is harder. It's more challenging but it has really good effects and doing the analogy to working out does help because everybody knows working out the more you challenge yourself the healthier you are.

Dr. Ron Ehrlich: So, okay. Now that's about development but if the horse is already bolted to coin a phrase and the teeth are already crowded and someone's fronted up into your office, you've coined this word forwardontics. I wonder if you could share with our listener what that is and how that differs from the traditional approach to straightening teeth?

Dr. Sandra Kahn: Well, forwardontics, yes, it's my own term and it came from the work that Dr. Johnny did, and he called his technique orthotropics which are very similar to orthodontics, but I incorporated all kinds of techniques and forwardontics really focus on three things. If we really want to help the jaws develop to fit the teeth where orthodontics did the opposite if you have crooked teeth they say, "Oh, we need to arrange the teeth to fit the jaw that you already have". And when you said if you know if time has passed and you can't really change the side of the size of the jaw not because we're already grown there are other techniques that we can use. I don't really work a lot with adults, but we change the jaws as much as we can. The younger we address the problem the better effect we're gonna have.

So, if we are already adults we can stretch the job somewhat as much as a child, but we can do that. So, we can change the jaw, but we can always work on changing their habits. And even adults we can change our breathing habits so that we're breathing more through our nose and less through our mouth and then we also can you know focus on what we're doing at rest or improving the posture of our body and of our mouth will also help.

So, the forwardontics really encompasses all the techniques that we use to change their habits and change the size of the jaw. So, we pull the jaws forward with some appliances, we expand them, and we stay away from braces. We don't use braces.

Dr. Ron Ehrlich: Okay, yeah.

Dr. Sandra Kahn: I do like to make a point that I'm not against orthodontics. I'm still orthodontist at heart. I love my profession and I think orthodontic always really want to do the right thing, but you know we really haven't focused on things that really involve the cooperation of a patient. And that's the same in medicine. We want the doctor to do it. And forwardontics it's very heavy on patient compliance. Like you guys need to do most of the work and that's always hard.

Dr. Ron Ehrlich: Yeah but it's very rewarding because I think one of the issues with orthodontics and I know there was a study done at Washington University over many, many years 40 years I think, and they looked at all the orthodontic techniques and found that

relapse things relapsing to their old position or not maybe as far back but the things not being as straight as they were when people finish their braces occurred very commonly. I thought it was up around 90%. And I always felt well, why is the relapse such a problem in orthodontics? Why did teeth move after they've been straightened?

Dr. Sandra Kahn: Well, it's just what we've been talking about. If you don't change the base where the teeth are sitting, and you just change the teeth then the teeth really don't have more room. They just you know kind of you pressure them into being in a certain position and if the if you don't focus on the reason of why they were crooked in the first place, let's say you were you know you had some habits where you were pulling your lips in. A lot of people a lot of my adults I asked them to swallow, you could see how they squeeze their lips really hard. So, if you if you suck in your lips you are going to be you know putting a force on your teeth to be farther back inside your mouth and that will give them less room. So, we teach you know our adults to relax as they swallow. And that brings us into the GOPEX program which is our exercise program.

Dr. Ron Ehrlich: Yes, I wanted to talk about it.

Dr. Sandra Kahn: Yeah, that's learning a new way to chew, to swallow and to breathe. And when I say breathing it also includes how you speak. Because when we're speaking if you observe people most of us speak when we're speaking we breathe through our mouths. So, we can change all these habits and that helps with stability. Again, we start with an adult it's going to be much harder, but we can do exercises to improve the potential of our teeth staying where they doing they need to be. So, as you said the research shows that you know whatever we do it's not permanent.

Dr. Ron Ehrlich: No. And the tell us about the GOPEX exercise. So, this is G-O-P-E-X. You know you're focusing on lips, tongue, cheeks.

Dr. Sandra Kahn: The magic of the GOPEX exercises is that we're not giving anybody any new exercises. We're just telling them that what they do already needs to be done with a different intention. It's really the intention. So, let's say I want to teach you to breathe through your nose when you're speaking. Then you know I have usually I work with children, but adults can do this program too. But what you do is you take five minutes a day and you read, and you read those five minutes with a certain intention. So, you use a comma and the periods to make a pause, close your mouth and inhale through your nose and then you keep speaking.

So, you know you learn a way ideally you repeat it enough time so that when you start speaking you're always speaking breathing through your nose. And that has a lot of health effects and benefits that we talked about the function of the nose. So, the more we breathe through the nose the better and the same with the chewing. We talk a lot about you know bringing back the family meal, sitting together and eating slowing down food instead of you know eating in the car and just you know, taking a smoothie or a power bar and then gulping it really, really fast as we're running. To do something we want to slow people down at least one meal a day where you sit down, and you focus.

We've told the kids to chew like you mean it. So, you have to focus and think of the intention of chewing, chew on your back teeth side to side with your lips closed and chews harder and more consistent foods. You know we're not big fans of meat but there's a lot of foods that you can cook in a way that they actually more challenging.

So, the GOPEX is fantastic because it retrains your brain. And I'm fascinated by neurology and now that we have working MRIs we can see exactly how the brain can change. And the brain plasticity it's incredible. Neurology is one of those fields that is changing almost every day because we realize that the brain actually can change itself and we can by repeating something enough times we can change what we've been doing unconsciously. So, the GOPEX has an element of retraining your brain to have healthier practices in your life.

Dr. Ron Ehrlich: And if we were trying to retrain our brain to do the right thing with our tongue what would you say to your patient doing a GOPEX exercise for your tongue or the intention?

Dr. Sandra Kahn: Well, we talk about the topic premise which is really having the tongue resting on the roof of the mouth having teeth and light compact and breathing through the nose. So, that's the grasping posture. So, when we sleep we're supposed to have that tongue on the roof of our mouth but it's very hard to tell our tongue what to do. And it is very interesting if you tell the tongue something the tongue will do the opposite.

Dr. Ron Ehrlich: Don't we know that as dentists?

Dr. Sandra Kahn: Yes, yes. Definitely. If you're trying to work you know, and you tell the patient you know, keep your tongue away from this tooth because I'm going to work here. The first thing the tongue hears is just like "Tongue? Anybody said tongue? Did you call me? I'm right here.

Dr. Ron Ehrlich: Exactly.

Dr. Sandra Kahn: So, you want to avoid even saying tongue when you're working. So, basically you want to focus on the activity itself and the intention of the activity that you're doing. And at the end of the day, we have not evolved. I don't know if you talked to Paul about this, but this was the most important part of our collaboration is that he's an evolutionary biologist. So, he's the authority telling me that the way our jaws are hanging right now, and the sizes are not, it's not a genetic problem because we haven't had enough evolutionary time to really have changed the size of our job.

So, we really have the same jaws of these hunter-gatherer skulls that I was studying that have you know. A centimetre of space behind the third molars, yeah, extra space. We have the potential to have that huge size of the jaw. And if we have that size of jaw we're not going to have to snore or sleep apnoea or crowded teeth. We're not going to have any of the issues.

So, if we start taking some of those habits of the hunter-gatherers and you know, we know now that walking... if you walk 10 miles a day it's very hard to get sick. And the same thing if you chew with an intention and you're chewing on non-processed foods and chewing them

properly then you're going to be healthier. And it's something that we can all do and it's the GOPEX helps you and guides you and it has to be repetitive so that the brain starts doing in the tongue up actually you know, it's part of our digestive system so it has a mind of its own. So, we got to just repeat the same things over and over to really make a change, but it can be done. It can be done.

Dr. Ron Ehrlich: Yes. What's your youngest patient that you've seen in your practice?

Dr. Sandra Kahn: Well, you know, that's an interesting question because I like to talk to pregnant women. That's how early I'd like to see the patients because we can start with those habits you know even before the baby's born. And there have been studies about you know sleep apnoea, mothers that have sleep apnoea and they're breathing through the mouth a lot and how that affects the unborn baby.

And my ideal time really being more practical logistically is once the children being weaned. Then I can help to choose foods that are going to foster health. So, between you know, 18 months 12-18 months to two years to four years. That would be the ideal for me if I could have a practice and teach parents how to teach their children that would be ideal. But we know that parents have so many other things in their mind at those times it's hard to think of pulling them to the orthodontist.

So, my most common age that I'm going to end up having is around seven-year old's. Six-seven-year old's when the first permanent teeth come in then the parents look at those teeth and they go "Oh, my God". And I have friends that have you know, five-year old's and they bring them to me and they pull their lip down and say "Look Sandra. Look. The first tooth is coming in and it's actually you know ninety degrees where it should be. What's going on?" And usually traditionally we say, "Well, wait till they're all in and then we'll do something".

And if I can focus on six-seven-year old's in chewing well and breathing well and fostering all those GOPEX techniques then they will not even have a problem because that will be reversed.

Dr. Ron Ehrlich: Yeah. Now, well, how has the profession accepting this approach of forwardontics takes and GOPEX exercises? Are they embracing it with open arms, they are excited about it?

Dr. Sandra Kahn: Well, we tend to be very slow. If you read the book, we even have an example of Ignaz Semmelweis you know teaching sir just to wash their hands and that wasn't received by the profession. We know that we're very slow and incorporating new ideas. So, the profession is slowly realizing that what we're doing is not permanent and we have to think of better ways but it's not easy and it hasn't been accepted yet and that's why we focus on writing the book. You mentioned that it's very readable it's short and it's explaining to the layperson all our concepts. So, we're bypassing the professions of that.

My goal is to have the parents demand better treatments. The parents can hold my book and go to the dentist and say, "I don't want teeth to be pulled out of my child. I want my child to be seen at seven years old". And if they are told to wait they should find somebody else's and



say “No, this is a time where I want to you know, make sure I focus on prevention and not correction”.

Dr. Ron Ehrlich: Yep. Look, it's a beautiful book and it's beautifully referenced so if a parent was taking it along too professional, the parent could not ask for a better-referenced text. It's terrific. Listen I wanted to ask you before we finish I want to ask you one last question. Taking a step back from your role as an orthodontist practicing forwardontics, what do you think people's biggest challenge is today on their health journey in our modern world through life? What do you think that challenge is?

Dr. Sandra Kahn: In relation to what I do or?

Dr. Ron Ehrlich: No, just generally. Just generally. You know, that's what I'm saying take a step back from your specialty. Your observation as a person traveling through life trying to be as healthy as you can and having watched many other people, what do you think the biggest challenge for us on our health journey is?

Dr. Sandra Kahn: Well, in our health journey I think the most difficult thing is being able to recognize what works and what doesn't. There's so much information out there. The Internet is fantastic in one way but it's very confusing in another. So, finding exactly what works and what is just you know a snake-oil. It's become very, very hard and because the practitioners are so siloed. We talked about that. It's very hard for us to have an opinion on everything. Every day I have somebody come up with a question and I have no idea what they're talking about.

And so, figuring out what's good information and what's not it's the biggest challenge. We got to make sure that we as professionals we look, and we understand what's going on. You know common sense always helps because what we are talking about makes a lot of sense to parents and you know when we have collaborations like an evolutionary biologist and an orthodontist we start seeing things that you know, make sense because we know how our species has evolved. So, we need to have practitioners that you know, they jump to different areas and you know, just looking at all the information and deciding what's there and what is there just to make a profit and what's really there to help your health.

But common sense is the most important thing that we can do to help our health. Just like we were talking about blocking a lot and think that you know have done for hundreds of millions of years and incorporate those practices. But that's a big challenge.

Dr. Ron Ehrlich: It is a big challenge. Sandra thank you so much for joining us today. The book is fabulous. We're going to have links to it. I know all proceeds go to the non-profit organizations that both you and Paul are associated with. So, thank you so much for joining us today.

Dr. Sandra Kahn: Absolutely. Thank you very much for bringing this work to the public.

Dr. Ron Ehrlich: Interesting that in Europe you had to complete a medical degree and then do a subspecialty of dentistry. It's a recognition that the mouth is connected to the body. In the

USA, UK and in Australia the way dentists are trained has been until recent times at least very separate, very mechanical. Fixing broken teeth and it's been very easy to lose sight of how connected the mouth is to the body. And at the risk of stating the obvious it always has been connected and it always will be. It literally is the gateway to good health.

I thought it was also interesting to his Sandra's say "Challenging ourselves is always healthy. That's why exercise is good for you and that's why chewing more mindfully turns out to be a challenge worth pursuing lots of reasons". "Chew with intention," she said. She said, "Slow down, breathe through your nose, chew your food, start the digestive process where it's meant to be started. In your mouth".

Another thing is that new concepts in medicine, healthcare, dentistry, no matter how sensible or obvious they maybe are slow to be accepted by the profession as a whole and even slower by organizations that teach them. Sandra mentioned Semmelweis. You may have missed it, but Ignaz Semmelweis was a doctor in the late 19th century who had a very radical idea. That at the time the profession totally rejected and in fact ridiculed for over 10 years he became so frustrated that he ended his life in a mental institution. Semmelweis very radical idea was and wait for it... That medical staff should wash their hands and sterilize instruments between surgery when they move from one patient to the next.

Now can you imagine how they respond to even more radical ideas than that? A sobering thought. So, I'll have the links to the book of course and her website Sandra's websites on forwardontics as she has appointed the term. And it is a great book I can recommend it. So, until next time this is Dr. Ron Ehrlich. Be well.

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