



Facebook AMA - Dr. Carol Flexer

Dr. Teresa Caraway: Hi there. I'm Dr. Teresa Caraway, CEO of Hearing First, and welcome to our Facebook Live Ask Me Anything. We're here today broadcasting from New York City, and we're so excited that you've joined us. And a little bit first about our organization is that at Hearing First, we believe that every family needs to know the status of their baby's hearing first, because all child development hinges on that and how important that is to be aware of the status of a baby's hearing. And we're doing things to raise awareness, to provide education about the outcomes that are possible for children today who are deaf or hard of hearing to learn to listen and talk. And we provide communities of support and communities of learning so that we can all grow and learn and support each other along this journey of teaching a child to listen and talk.

T. Caraway: But I'm excited today because one of my wonderful friends and a special mentor of mine, Dr. Carol Flexer is joining us, and she is extremely well known in the field of listening and spoken language and beyond, and has really contributed to our knowledge base, and shaped the practice of how we teach children to listen and talk, and access that brain for learning. And so, Carol, thank you for joining me today.

Dr. Carol Flexer: Thank you.

T. Caraway: And joining the conversation. And one of the things I think ... I'm trying to see on my shelf how many of your books I have and trying to count them in my head, but how many books have you written in the course of your career that have contributed to what we know today?

C. Flexer: Well, written and co-edited 14, but 2 more will be published soon, so it'll be a total of 16.

T. Caraway: Wow, 16 bodies of work. That's a lot of hours putting together thoughts on paper and research. And speaking of research, how many articles have you written over to date?

C. Flexer: Well, I'm quite old. So, about 150, 155, something like that.

T. Caraway: Yeah, but it's been tremendous, and I want to say, you know, you've just shaped what we know and understand and the practice of what we do today with kids to know what it takes to do to help children reach their full potential. So, I want ... We're here today, and we're going to be discussing the hearing brain. And it's a topic that's a passion of both of ours.

C. Flexer: Very much.

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T. Caraway: So we hope we won't get too carried away, but you're invited to submit your questions by posting in the comment section below, and we look forward to answering your questions that you might have today. So Carol, many times I have heard you say that we hear with the brain. And can you tell us a little bit more about what that means, and what we need to know about that?

C. Flexer: So, we talk about hearing as if it's an ear phenomenon, but in fact the knowing of the meaning of that sound occurs in the brain. Well, you know, think about the brain. It's this kind of squishy organ, totally encased in bone, yet how does the brain know anything? And in fact, it knows everything. The brain receives different types of environmental information through our five senses. You know, we have hearing, vision, taste, touch, smell, and each of these senses capture different types of environmental data.

C. Flexer: So for example, the nose captures different olfactory molecules. But whether, for example, you sniff and you, oh, I smell a cookie, or I smell a diaper that needs changing. Does the nose know that? No, the nose knows nothing. So what knows? It's the brain.

C. Flexer: Well, so for hearing, when you hear your mother speaking, or music, or the dog, does the ear know that? No, the ear knows nothing. What the ear does is it captures raw, vibratory data. That's the back and forth. That's the environmental data that the ear captures. Through this amazing process, that vibratory information is transformed into neurological impulses that reach the brain. So, how does the brain know that this neurological impulse is my mother's voice? Well through exposure, and practice, and conversations, the learning of the meaning of that auditory event occurs. So, everyone needs to get, parents need to get that if their child has a hearing loss, the problem is in this doorway that receives the initial raw vibration. The impact, the intent, is we have to create the neural pathways in the brain where the knowing of the meaning of that auditory event occurs.

T. Caraway: Yeah, so in essence that we hear with the brain, and it's so important because that's where all learning occurs. And we've all been pre-wired to learn spoken language through the brain, through the accessing the brain.

C. Flexer: Right. Humans are organically wired to listen and talk, provided we get auditory information to the brain to trigger those pathways and the connection between auditory input and spoken language output. And then the integration of the auditory with the visual, with the olfactory, with the tactile event, that all occurs in the brain with exposure and practice. And that exposure and practice has to start very, very early at birth.

T. Caraway: Yeah. So, when you speak of that at birth, so what does that mean in terms of the purpose of hearing technology and the timing of hearing technology for a child who is deaf or hard of hearing?

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C. Flexer: So, let's start with the type of hearing technology, whether hearing aids or cochlear implants, depends on what's going on in the doorway. And so, what's the problem in the doorway? Could be anything from fluid, to a sensory neural hearing loss. If the doorway is closed a little bit, we might call that hard of hearing. If it's closed more, more hard of hearing. If the doorway is closed, we might call that deaf, but that's the doorway. And then the purpose of technology is to breach the doorway to deliver auditory information to the brain so the child acquires knowledge.

C. Flexer: The only purpose of technology, the only purpose, is to get auditory data from the environment through this doorway into the brain where learning can occur.

T. Caraway: So, if that's the purpose of hearing technology, to get learning to the brain, what does that mean in terms of how much should a child be wearing their hearing technology everyday?

C. Flexer: Well, we actually have data, different research projects, that have identified that the technology should be worn at least 10 hours a day. So, but think about what that means. For typically developing children, think about how we're made organically. For example, do you have eyelids?

T. Caraway: Yeah.

C. Flexer: Really.

T. Caraway: I have eyelids. [crosstalk]

C. Flexer: [crosstalk] You do. And if you close them, you can't see. So, humans are made with a way to close the visual doorway. Do we have ear lids?

T. Caraway: No, I do not have ear lids.

C. Flexer: No ear lids, so humans are not made with an organic way to close the auditory doorway. So, to people with typical doorways, their brains receive auditory information 24/7. For people who have a doorway problem, their brain is receiving clear auditory information only when they're wearing technology. So families, if your child has a doorway problem and your desired outcome is listening and spoken language, that brain must receive auditory information at least 10 hours a day. And we're not saying to wear their technology 24 hours a day because none of our current devices are engineered for 24 hour wear, but for that 10 hours to be worn with well fit, appropriate devices with enriched auditory information fed to the brain to grow that brain, to be clever, and smart, and knowledgeable, absolutely critical.

T. Caraway: So, an easy way to remember it is "10 to win" and that's what the goal needs to be.

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C. Flexer: Good way to say it.

T. Caraway: To grow that brain.

C. Flexer: Good way to say it.

T. Caraway: So you had mentioned about knowing what outcome a parent wants, and how they want this to all turn out for their child, and what they envision for their child. Can you talk about a little bit about what parents need to consider as they're thinking about what opportunities or what outcomes they want?

C. Flexer: Right. And that's a conversation, this outcome conversation, that professionals must have with parents from the beginning, and revisit it because all of our intervention strategies are informed by that family's vision for their child, their desired outcome. We know that approximately 95% of families who have children with doorway problems are hearing families. So the vast majority of our families are going to be very interested in a listening and spoken language outcome. And many families speak a language at home that is different from the language taught at school so they might want their child to know and speak several spoken languages.

C. Flexer: We recommend that families speak their home language first to their child because you know as parents, we're our child's first teacher of information, of language, so you need to speak a language where you know words, you have experience, you have a richness of concepts that can be conveyed. So families, whether or not their child has a doorway problem, are advised to speak with their child in a language they know, the language of the home.

T. Caraway: Yeah, and I think that's very encouraging for families who have children with hearing loss because what that means is, we've talked about 10 to win to grow that brain. And now what I hear you saying is that families are ready to and equipped by speaking the language of the home, what they know best, to be their child's first and most important teacher, to talk more, and to take turns with their child.

C. Flexer: Exactly. So, parents already know how to interact with children. And what their interaction with their child with the doorway problem is not a different type of interaction. It's perhaps more. Maybe more turn-taking, more reading aloud, more singing, not different things because we're growing the brain of a child with a doorway problem like you would grow and develop any child's brain.

T. Caraway: So, let's talk about that. You've talked about the doorway. Can the doorway to the brain ever be closed so much that it's not possible to reach that brain, such as when a child is profoundly deaf?

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C. Flexer: Right. Right. So, because 95% of our families are hearing families, when they hear the word deaf, that sounds like there's no hope for auditory exposure, none. But what deaf means is that doorway is closed. Now unless there's no auditory nerve, which is very rare. And we are actually ... There's a lot of experimentation going on with auditory brainstem implants, so that's moving along as well. But right now, as long as there is some bit of auditory nerve, we can typically get enough auditory information to the brain if we do what it takes and enrich that brain to develop and integrate that auditory brain with the rest of that child's experiences out there in the world.

T. Caraway: Yeah. And so that's the, I think, an encouraging message for today is that we have this whole continuum of hearing technology that allows pediatric audiologist professionals to access that brain for learning through hearing technology.

C. Flexer: Exactly. And it's very critical, right from the beginning, for audiologists and other professionals to really have these brain conversations because parents need to get that what's at stake for their child is their brain development, and that in order to have an impact on that child's knowledge acquisition, you've got to actually get to that brain.

T. Caraway: Absolutely.

C. Flexer: And when there's this doorway problem, we have to use that technology.

T. Caraway: Absolutely. And there is an urgency to get that doorway open.

C. Flexer: Very much so. Yes.

T. Caraway: Yeah, because that's how babies are learners from day one, and the earlier ... We know the earlier that a child is diagnosed with hearing loss, the earlier they're fit with hearing technology, the earlier they begin intervention, that the better the outcomes are for growing that brain and making that child smarter.

C. Flexer: Right, because then the more that child will know. Yeah.

T. Caraway: Well I think you and I could go on all day long.

C. Flexer: We could.

T. Caraway: And keep talking about this, but our time is up. And I want to say thank you so much for joining me in the conversation today.

C. Flexer: Thank you.

T. Caraway: We always get so excited and energized when we get to talk with each other, but Carol has written a fabulous white paper for Hearing First, and it's called *Start*

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with the Brain and Connect the Dots. And in that, you've summarized some major research findings that talk about how that child begins to develop a hearing brain that leads all the way to literacy, and it's a wonderful information tool for parents as well as professionals to learn more about the hearing brain. And then, if you'd like to hear more about Carol's work, I encourage you to go to her website, CarolFlexer.com and learn more about the work that she's doing and where in the world you might be able to find Carol on any one day as she travels the globe to talk about the hearing brain.

T. Caraway: And if you'd like to continue this discussion with friends, with family, come join our Family Support Community. There's lots of conversations going on and sharing ideas about how to grow little one's brains so that they can reach their full potential. And then professionals are also engaging in learning and conversations in the Professional Learning Community. So, come join us. We'd love to have you there and would love to talk more with you. And if you'd like to stay up to date on the latest listening and spoken language related information and resources, be sure and subscribe to the Hearing First newsletter. That's another way for you to connect and stay up to date. But, thank you, friend, for being with us and thank you guys for joining us today.