

ROUGHLY EDITED FILE

Wednesday Webinar Series: How Do Infants and
 Toddlers with Hearing Loss Learn to Listen and Talk?
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 Clarke

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Jan: Welcome, everybody. I'm Jan Gatty from the Clarke Schools for Hearing & Speech. I'm happy that you came to our seminar at lunchtime today called How do Infants and Toddlers with Hearing Loss Learn to Listen and Talk. We have talked about hearing aids and cochlear implants in earlier seminars but now we're going to talk about an overview of strategies for providing auditory process and fostering early language development.

I'm Jan Gatty and I'm the director of services for children and families Clarke schools and I'm co-director of a telepractice project that we're doing in collaboration with CREC Soundbridge in Connecticut. I would like to introduce Barbara Hecht. Barbara is the Director of our Boston program. She's also the President of Option Schools International, which is a consortium of private schools for children whose parents decided they wanted to use listening and spoken language. Barbara is also co-director of our telepractice program.

Barbara: Hi, everybody.

Janice: And seated behind me is Elizabeth Cole. Elizabeth is the Director of CREC Soundbridge Program. This is a public school program, very much with a mission like Clarke and they're serving children, infants, preschool, school age children who have a hearing loss and who's parents have also chosen to use spoken language with them and she is also a co-director of our telepractice project.

I'm just going to point you to Elizabeth's book. We have referred to it a couple of times during this talk because it's used in training teachers and have some great materials to support what we're going to say today.

Elizabeth: Hello, everybody.

Janice: So I'm flashing the mission of our two organizations on the screen. I'm not going to read

them. What you should take from this is we have similar tenants, values, beliefs and ways we work with family and children who made the decision they want their children to learn spoken language.

This is the third in a series of four Webinars. The concept behind this is that we were -- they are prepared for people dealing with early intervention but may not have expertise in hearing loss but will have children with hearing impairment on their case load. So its design today is an introductory overview of the current technology practice and research.

People have been coming to the earlier ones are clearly very experienced and we're really pleased about that. We hope it will be helpful in training parents that you work with. But really our goal is to be very basic and make the information really accessible for sort of beginning learners in this specialty field.

The group that you have collected here focuses with all of our expertise, research and practices in the area of using spoken language with children who are deaf and hard of hearing and it's because their families have made that choice.

But we're really respectful of this period of time where families are looking at different options, trying out different options to see what's going to work best for them and their children. If you came to Webinars one and two, you should recognize this information that was presented earlier and if you haven't, if this is your first attendance, we would just like to remind you that the earlier Webinars are archived on the Clarke website and you can look at those.

In the first Webinar which was on hearing in the 21st century, we talked about advances in hearing detection and intervention, diagnosing children with hearing loss early in their life, hearing devices they can use, and then advances in hearing research.

The second Webinar was on the development of the listening brain and at that time we talked about auditory brain development, optimizing auditory access very early in life so that the brain really gets everything it needs to develop fully and partnerships we form with parents and other professionals so we can carry out this work effectively.

Our learning goals today are written in a question form. We're all teachers here. We have expectations of what you will know by the time you leave in an hour. So I think I'll just read the questions. But I'll tell you what you'll be able to do at the end of the hour. You should be able to identify some basic modifications in the child's environment so that they have really good auditory access to spoken language. You should be able to describe the role of social interaction, cognitive development and play in the development of listening and spoken language. And it may not be really didactic but if you look at the slides carefully, all of those areas of development are woven into the information of the slides. You should be able to list strategies an adult would use to facilitate spoken language in deaf and hard of hearing children and you should be able to name specific observable behaviors to let everybody know this process is taking place in a good way, the children are actually learning language well enough to be confident with their parents communicating with their parents. Going over some basic definitions today since these words are used differently in the different contexts.

And also, because I think parents who are really new to this field often some of this lexicon gets confounded. So when we talk about communication, we're really referring to the messages that people exchange with each other, with or without language. So it may be language but it can be supported by gestures, body language and situational information. When we talk about language, we're talking about a formal system of symbols. The symbols stand for concepts and ideas and there's a system of rules for combining the symbols to convey a particular meaning.

Language doesn't have to be spoken to be a language. It can be signed or written or it can be in spoken form. When we talk about speech, that's an aspect of spoken language but speech really refers to the acoustic aspects of language. It refers to the sounds and the rules for combining those sounds

used to convey words and sentences in a particular language. Children learn to communicate in their native language by interacting with fluent users of that language.

When we talk about sending and receiving messages, we're really talking about expressive language and receptive language. The language we understand and language that we produce and use to convey what we mean to another person.

To be a successful communicator, we need to be able to share a topic and a context with the speaker. And we need to have a message that's meaning meaningful and understood by the listener. I'm getting ready to turn the microphone over to Barbara but I wanted to give you a background of how Barbara is going to present her material.

In order to understand how to help deaf and hard of hearing children become fluent language users, we really need to understand the principles of typical language development in hearing children. We use this as a guide and a frame work in terms of our work with children who are deaf and hard of hearing and we know now, if we start early enough and the children have early good appropriate access to spoken language and their parents feel confident about interacting with them linguistically, they have a really good chance to follow a typical path to language acquisition and language development. Barbara?

Barbara: Thank you Jan and again, welcome everyone. We're having a wonderful, beautiful sunny day here in southern New England after the snow and it's a pleasure to be with you for our third Webinar in our series.

Children acquire language in the course of everyday interaction, preferably with caregivers whose love and adore them and who respond to every fledgling effort they make to communicate. Language develops really in the course of play, a care giving routines and the normal activities of daily life. And language is the substance in which we bathe children in all their waking hours especially when those conditions for accessing the language are optimal.

Hart and Risley said it just beautifully. What they said is that infancy is a time of hopelessness when nearly all of children's experience is mediated by adults in one to one interactions permeated with affect.

Children are basically inculturated into the community of language users they find themselves in from their very earliest days of life. Their early cries are attended to, their every burp and coo can be interpreted as a conversational term. And we know that that early inculturation, that early access to communication really does make a difference later on.

It's really through that nurturing relationship that children begin to get the idea that there is this back and forth activity that we sometimes call the language game.

Research shows that there are certain aspects of this language game and certain aspects of the way that adults interact with children that really does make a difference in the rate and type and quality of development even for typically developing hearing children. One of the most important components of optimal interaction is joint attention or joint reference. If the parent and child are jointly focused on something and then the parent talks about it. Also parents who engage in turn-taking, or turn-taking conventions really overtly signal their intention to communicate. It really help children as they're figuring out this whole system of communication.

Many of you are probably quite familiar with some of the optimal characteristics of caregiver language what we sometimes call motherese or parentese. Most important is this positive responsive turn taking type of interaction and we see this sort of interaction from the very beginning when even -- with nursing mothers who will comment to their children as the children are taking a break from sucking and then go back to being quiet.

Parents who are effective at exposing their children to language treat that infant and young

communicator as a child who has communicative intent even if the sounds or noises they make a quite unintentional. It's a way of giving them the idea that the noises they make could possibly be a turn. So there's essentially a listening conversational participation and they're inviting the children to play this back and forth volley with them.

Typically parents who are tuned into their children interact with them at a slower pace than you would necessarily interact with an adult. They pause to give children turns. They talk about what's going on in the context so that the context can actually support the child's understanding of the meaning of the words and utterances. They use typically short redundant and very grammatical utterances.

It's quite unusual for parents to only use partial sentences and they adapt those utterances and they adapt their pacing to the child's tempo, to the child's temperament and as the child matures, they adapt their utterances and their part of the conversational turn to the child's growing abilities.

So language is really acquired throughout the day during every day routines. It happens during meal times, it happens when you're reading a story at bedtime, it happens when you're sorting the laundry and you're cooking, changing diapers, etc. You don't have to set aside language time as part of the day in order for children to do quite well at picking up the system. And in fact being exposed to languages during daily routines gives the children a lot of experience over and over again through those routines with similar language, so they can begin to unpack the language code.

Language certainly also happens when parents and caregivers are directly playing with the child. They may not see that play at all as having a goal of language development. It really is a means of connecting socially and helping the child to learn about the child's environment and to develop the cognitive underpinnings for later language development. Language develops while we're playing with sand and blocks and dolls and balls and making trucks go around on a toy road. It happens outside, it happens inside. It happens with things that aren't toys at all like pots and pans and almost any found object.

There's quite a bit of research now on the impact of caregiver language and language style on the development of language and typically developed hearing children. Early on in the mid-90s, Hart and Risley conducted a series of ground breaking studies looking at the characteristics of language that children were exposed to, children from various socioeconomic backgrounds and they found that the type of language that children were exposed to and the amount of language had a long term impact on the children's later language development. The number of words children were exposed to, that were actually directed at them correlated later with the number of words in the child's own vocabularies.

The number of turns they took had an impact on how talkative the children were. More recently the LENA foundation has conducted new research that really has bolstered that early work by Hart and Risley. Some of you may be familiar with the LENA technology. The LENA is a device that actually allows us to record all of the interactions that the child is exposed to and actually all of the sound and the environment that the child is exposed to during their waking hours. And it gives us an enormously helpful and detailed picture of language exposure.

That research now has really shown us that not only are the characteristics of parent's language predictive of the children's later language development but when parents are given feedback about their talkativeness or lack of it, they can actually change their behavior.

Most of the time parents actually over estimate the amount of time they engage with their children and when they see some of the data that comes from the LENA device, then they can actually use that information to optimize their interactions with their children and this is particularly helpful. We're beginning to see this used with children and parents who have language learning difficulties and children with hearing loss.

One of the most important findings, actually, is this one we call the elephant in the living room and

that elephant is the TV. Television viewing is negatively correlated with language development for typically developing hearing children and if that's the case, it's even more problematic than for children with hearing loss. Children with hearing loss have great difficulty picking out sound when there's a lot of background noise and picking out the words that are spoken to them. We know that young typically developing children also have a lot of trouble with background sound but probably most important about television viewing is that television is not interacting with the child and it's not a source of language development and it's a time when the children are not engaging directly with the child.

Elizabeth: I just wanted to mention one thing is that elephant in the living room is the title of a book by Dr. Christakis and if anyone is interested, they could Google the TED talk he has given where he does include some discussion about the negative effects of television.

Barbara: And I think as we learn more and more, clearly there are other electronic devices that take parent's attention away from interacting with their children that we really want to be aware of. Smart phones, iPads, laptops, all tend to interfere with that development.

One of the things at Clarke that we like to talk to parents about even parents who enroll their children in our preschool program is how little time we actually have with them in our preschool. Our preschool actually is a four-hour a day preschool which means that the children are with us 20 hours a week but that 20 hours is really only a small part of the child's waking hours that children are actually awake and not at school and not on a bus or not in the car. At least another 71 hours and one of the questions we always ask parents as they're thinking now the child has gone off to preschool and they have handed them over to the professionals, we say to them, what is going to happen? What are you going to do with the other 71 hours when the child needs consistent accessible language exposure?

So, if that's the true for preschool children, it's even more true for infants and toddlers. So if we look at typical sleep and waking hours toddlers and infants are asleep for about 91 hours a week and awake for about 77 hours a week. Early intervention is typically for an hour. If you make one visit a week or two visits a week, there's a toddler group. Maybe it's up to three hours a week but you can see what a tiny slice of a child's day that early intervention program is. So that leads us to our first polling question. And you'll see the question appear in a moment on your screen. Intervention sessions are time limited. The best use of the practitioner's time is to work directly with the child as the parents observe in order to learn strategies to use with their child. Is this statement true or false? We'll give you a minute to enter your answers.

I think we're going to close the poll and we can show you the results. Most of you said that statement is false and you are correct. Good for you. The reason that's a false statement is that we want to leverage our time with the parents, that limited time in order to give them practice doing just the kinds of things they're going to do when we leave the home or when they leave our center.

If you think about the principles that we're all learning about, principles of adult learning, we know that hands on active participation is the best way to learn these skills so what we're really hoping and finding is best practice in early intervention is for us to be a guide on the side and a coach to parents.

It's very very tempting for us to reach in and take over and do a lot of demonstration but if we rely on that alone, we find that parents decide we're really the experts and those they really don't have the skills they need to carry on.

Janice: I'm just thinking as you're saying this. They also don't get the chance to make mistakes in a safe way and they need to do that in order to learn and get better.

Barbara: One of the things then, if parents are key and their interaction with their children is key to language development, then the parents desired outcomes and desired methods of communicating with their child are going to be critical for that child's overall development. So what we really want to ask early on is what is the family's desired out comes for their children, what language languages do they

want them to be able to use and what do they hope for their children? Not just while they're babies but what do we hope for them as they reach school age and beyond?

If the parent's desired outcome is clear, fluent spoken language, then the best outcomes are associated with approaches that use basic principles of listening and spoken language. We spoke of that in prior Webinars but just to review, what we know is that children need consistent, redundant enriched access to fluent speakers and access to the sounds of spoken language.

It's often been truism to say that you "say what you hear". We know that spoken language is an acoustic event and if you think about this in terms of a child with hearing loss, what does that mean? If the child doesn't have access to certain sounds, you're going to hear it in their productions. We need to use that evidence of what they say to examine what they're hearing. If the child is leaving off "S's" like "Pop that" instead of "stop that", maybe it's because they don't have clusters yet, but we also want to see whether they have access to the S sound, that high frequency soft sound.

So auditory language learning is very very much based on what children hear and that's why when we look at children who are now coming out of our listening and spoken language programs, their speech sound so much clearer and more accurate than it did in generation ago when the technology didn't give them that kind of access.

Visual information through speech-reading, or what people sometimes call lip-reading, is actually a very poor source of primary information about language. Some people are quite good at it but it is very difficult system to use. It is -- it can be a supplement but it's very difficult to use vision as the primary source for spoken language. And we also want to remember that receptive spoken language learning has to be the initial focus. It's through listening and getting access to that language that we focus on at the start.

Now, I'm going to turn the mic over to Elizabeth Cole.

Elizabeth: Thank you Barbara. It's true that listening has to be the focus initially but this auditory linguistic learning is just part of the interwoven fabric of all young children's learning so that fabric includes cognitive development as well as auditory and linguistic, sensory development and all kinds of learning that even motor development.

So all of these things are related to each other. But we're pulling out the auditory and linguistic learning since that's the area where the child with hearing loss needs to be focusing and the parents and the professionals around them need to focus on it. The child just gets to enjoy it.

We expect the child to follow a normal developmental sequence. Assuming that they do have good auditory access, we can assume that we can use typical development for the sequence we follow in terms of assessing the child, figuring out where they are in that sequence and also figuring out where to go next so in essence, a curriculum.

But there are special things that you do for children who have hearing loss. And particularly because the child with hearing loss lacks the kind of cushion that a typically developing normally hearing child has, that cushion being clear and constant access to linguistic redundancy. There's a lot of repetition -- here I am repeating that but there is a lot of repetition and redundancy in what's said and within the environment so that's the thing that we need to make sure we can create for a child with hearing loss. That really means that we're providing optimal auditory access that's out of that cushion.

And part of what is special about what you do with a child with hearing loss and we're making sure that the language interaction style of all the adults around the child is optimal also in the ways that Barbara just described as being appropriate things that parents do that encourage or facilitate the child's language development.

And we're also providing many opportunities which are enhanced by the adults understanding of the importance of each part of that experience.

So lots of talking, lots of interacting in all kinds of situations. For normally developing children, it may not be as important to talk throughout all day long but for a child with hearing loss, it definitely is. When it comes to spoken language learning, the most important thing I think to think about is when there's a problem, you think about hearing and listening first as the source of that problem. And one example that I always think of is the example that actually happened in a kindergarten class that I know about where the child for a day or so started to -- well, he started to participate a whole lot less in class and he started to nudge his neighbors and make noise and be distracting and he was kicking his feet and I was worried about this.

And he was talking less too so the teacher talked with a parent and the parent said, you know, he might be very tired. He's been having nightmares and waking up at night and the teacher thought, that's important and we need to sort of see if we can deal with that and then she also talked with the occupational therapist and said, maybe he needs a little wedge to put on his chair so he would be less squirmy and the physical therapist said, I think I do have something to suggest about the kicking because maybe he needs to feel some resistance and you know, so we'll put one of those really large rubber bands around the bottom of his chair and when he kicks, he can kick against that and not bother anybody or make any noise.

All of these were suggestions to try and solve the problem but what actually happened though is that the supervisor who was a teacher of the hearing impaired came in and said, you know what, I think we need to check his hearing.

And of course, the moral of the story is that this is exactly what the problem was. He lost ten decibels of hearing and that was true and the difficulty. And the interesting thing is the teacher had been checking his equipment and the equipment was working just fine but what hadn't been happening is that it was extremely difficult to tell a ten decibel loss in terms of her checking of the equipment on him. So we really needed to get him into the booth and see what his thresholds were.

Jan: I just thought of something. He didn't have the language to report that there was this change, but he clearly had the perception and he very effectively communicating it. He wasn't understood by the people but he was very consistent and we have to look at that behavior until they have language they can communicate with that.

Elizabeth: As the professionals in the environment, if you have a child with a hearing loss, you first have to think about the hearing and listening problems as a source of whatever the difficulties are or the behaviors that you're observing.

So what we need to do is share the auditory access for the speech signal and make sure they're properly aided. Another thing we can do is something I just referred to - is the teacher was checking the child's equipment and that's absolutely important. What she was using is called the 6 Sound Test which is from Dr. Daniel Ling. He was the one who came up with this strategy or technique for quickly checking whether or not the child's equipment is working properly. It's saying -- what you do is hook up the child's hearing aids or cochlear implants to a stethoscope and listen to what the child is listening to through the electronics. You say the sounds, OOH, EEH, AAH, SHH, SSS and also MMM in order to check the viability or the fidelity of the electronics for reproducing those sounds across the frequency range.

If you'd like more information about that, there's a number of different sources. If you just Google "6 sound test", you can come up with some. It's a well-recognized way of checking equipment. It can also be used for other things too but that's the one we want to talk about here. So that auditory access is through equipment that's working well and that's being worn all day long.

And also, you ensure auditory access by controlling background noise and/or using FM equipment in any noisy environments including the home or the car. And as Barbara said, one of the

great ways to control background noise in many homes is to turn off the television.

So what are some auditory strategies that can be used during every day routines? Here's a little list. One of them is to speak close to the child's microphone and not to be -- working hard, to have the child constantly watch your face. If he's watching your face, it's not particularly auditory. Of course, children do what your face sometimes but you want to be close to the microphone. You do that through positioning by having the child on your lap or having them sit beside you and have their attention focused on the toys. That's a natural way to interact with the child and it does mean you're close to the microphone which is just terrific.

The third thing on this list is expecting the child to listen and understand. So you talk expecting him to understand as you're interacting with them. Saying listen rather than look at me is another, kind of sign that professionals and adults are absolutely tuned in with, the auditory aspects of their communications. And one of the common things that professionals and parents start to do is point to the ear when they hear something interesting so this will draw the child's attention to sound and it's also drawing the attention to the fact they heard something.

You'll see in one of our later pictures, there's a little girl that's actually pointing toward her cochlear implant and I'm sure there's something connected to that, like I heard that sound. And all of that is important because it's what the target is - to have the child pay attention to sound and know they're listening. So drawing attention to sounds when they occur and you're noticing also when the child responds to it or they hear something when you talk about it.

If the child doesn't understand - because they won't understand everything - you have already said the message auditorily, one of the best strategies is to move close to the child's microphone and repeating two or three times at most and not ten and then show the child what you meant and then again present the message auditorily.

Jan reminded everyone earlier about the demonstration we did last time that shows what a difference it makes when the adult is speaking close to the microphone as opposed to being farther away. So even at this distance versus at this distance, I'm guessing that you can hear me even more clearly right now.

So the closer you get to the child's microphone and it's wonderful that the child is sitting on your lap because you're 4 to 6 inches away from the equipment.

I want to remind everyone about this combination of the fields of audiology and speech pathology education which we stand behind and are all pulled together in the expertise of the listening and spoken language specialist.

The things we have been talking about so far are things that anybody can do once they know they're important to do and the listening and spoken language specialist can support the other professionals on the team as well as the parents in making sure those strategies are being constantly utilized.

Other things though that we talked about last time. I think it was just the last Webinar where our basic auditory abilities such as the ones that Ira Hirsch first put forward about detection, discrimination, identification, comprehension and then the more extended list of auditory abilities and skills. These are aspects or elements that the specialist would be assessing as well as working on, creating activities so that the child follows this type of activity and this kind of task, I guess. In a naturalistic kind of way if at all possible. But I think it would be accurate to say these are things that are not expected of parents and non-specialist professionals to be working with.

But they are things that are important for the child to be acquiring for sure. So I have talked about auditory access and we have all talked about using ordinary everyday auditory and language teaching strategies and all the auditory abilities the child needs to acquire. So let's say all of those things are in

place. What now?

Then a miracle occurs. I think some of you have probably seen this already, this cartoon, but I think it is really a propos here. It says in the bottom - in case you can't read it - I think you should be more explicit here in step number two. That's what we're trying to do - we're talking about that miracle. The analogy is that all the formulas written on the board really correspond to our cochlear implants and the hearing aids and all of the technology that's available today. The miracle is what happens as a result of all the technology. What happens in the brain as the child is acquiring spoken language.

This brings us to our polling question number two. The question is, an 18-month old boy has had his cochlear implant (one of the technological miracles) for a few months. A tea kettle begins to make a high pitched whistling sound in the nearby kitchen. Which of the following are expected responses for this child with an early cochlear implant? With a child who has recently had a cochlear implant in the last couple of months.

- A - the boy does nothing and continues to play.
- B - the boy stops playing.
- C - the boy looks around the room.
- D - all of the above.
- E - B or C.

So you can make your choices now and wait a minute or so. Okay. Keep clicking there. We have almost everybody. Not quite. Okay, I think we'll stop there and I'll show you the results where 73 percent of you said B or C and those were the answers that we intended. It's true the child could do nothing and continue to play but we hope that's not what would happen. We would hope that the child would detect that sound and stop playing and maybe look around the room for the source of the sound.

So the answer is B or C. It's certainly possible that the child could be doing nothing and continue to play. It's possible that some children don't respond right away but we're assuming that everything is in place in the sense that the implant is functioning properly and the child has had good instruction which would help them to pay attention to sound.

Barbara: I just want to add if you find a child is consistently not responded as you would expect, that's a very good clue that either the device is not programmed properly, working properly or there's been a change in hearing status so you really need to use this sort of everyday information to give feedback to the audiological team.

Jan: Should we tell them what the results were?

Barbara: Yes, they saw it.

Elizabeth: Well, moving right along here. So sometimes when a child is known to have very very little hearing and is on the list for getting a cochlear implant but can't get it for a couple of months either because they're too young or because there's some other reason for waiting, maybe there's a waiting list. It's terribly important to continue to stimulate that auditory system so that the child is much more quickly able to make a much quicker transition to utilizing the input he gets from the cochlear implant. So of course, fitting with proper hearing aids, speaking close to the microphones and using FM and interacting verbally by using natural gestures like you would with any child.

And then also with specialist's guidance to be observing carefully for auditory responses and respond to them - just the things we talked about a few minutes ago. One of the things that would be different is guiding the child toward providing consistent behavioral responses. It's not different but it's something that you want to do very consciously with this child pre-implant so you can help with the mapping process.

There may -- probably will be need for some specialist's guidance and support for helping that child do that, getting them to respond consistently with sound. Sometimes that sound is the sound of

something as loud as a wooden spoon inside a metal waste basket or using a vibrotactile device. Any of these things can be useful for this process of training them to respond consistently.

I'll come back to the mapping in just a second. So as Barbara said, we need to at least mention some of the early signs that the hearing device, whether it's a hearing aid or cochlear implant is "working" and sometimes it's that the equipment is working but that the instruction either hasn't been exactly the right kind or it hasn't been long enough for the child to be able to integrate that input with meaning. So that's why I put quotations around working here.

Anyway, the early signs are things like the child startles or smiles or cries when the sound occurs. It's a response to a different kind of stimulation and then searching for the source of sound as we would hope the child would do with the tea kettle. Child sustains attention, and so this is moving along after some time- to start watching speakers and moving to music and showing they're listening for a little bit longer time.

Vocalizations could change – get more frequent and more "speechy" and even more time, responding to voices and environmental sounds and maybe they would pay longer attention auditorily to things like songs that you cannot see but you can certainly hear. If your equipment is functioning properly and your brain is using that input. Engage in vocal turn taking and getting more speechy in the kinds of vocalizations that the child is producing.

And mapping is the programming of the child's speech processor, the external component. And initially there is very frequent mapping, right after the child's equipment is activated -- it would be even on a weekly basis for a while but more typically say every two weeks for the first couple of months and then after that, at least every six weeks if not more frequently depending on what the child's auditory responses are. The whole point is to not over stimulate auditorily, but to provide enough stimulation so the child is getting the stimulation that they need.

Later, with listeners who have limited experiences I said, that would be young children every 6 or 8 weeks is a typical kind of frequency for cochlear implant mapping and as children are more experienced the older, let's say, high school level, and every 6 to 12 months is not uncommon for frequency of mapping but any time there's a change in auditory responses or in speech production, it's a good idea to think first about hearing and then get the child mapped.

This is now for Barbara.

Barbara: So we have one last polling question for you. A 12-month old girl has a severe hearing loss and has worn hearing aids for six months. She points to a ceiling light exposure and says – "yi – e". Which parent response is most effective at this stage?

Is it A, where the mother "says light, say light, llllllight". Or is it B, where mother says "yes, that's a light, you want to turn on the light".

Okay, our poll is now open.

Okay, I think we'll close the poll and show you the results. This is a very informed audience and 93 percent of you said it would be more effective for the mother to say "Yes, that's a light. You want to turn on the light."

It's tempting to try and correct children's misproductions or early attempts and one of the things we have to be aware of as early intervention providers is to help parents to engage with their child the way they would if the child actually did not have a hearing loss. We find that the more anxious parents are about their children's language development, the more likely they are to depend on strategies like demanding imitation and making corrections.

So we want to continually encourage these key caregiver skills providing access, demonstrating sensitivity to the child's needs. Engaging in behavior that's responsive and using language input that's adapted to the child's abilities. We want to encourage parents to acknowledge and expand on their

child's communicative attempts. There's nothing more discouraging in a conversation if we attend to "HOW" somebody says something, rather than "WHAT" they're saying. So we want to encourage parents to attend to the meaning of the child's utterances, or the attempted meaning, rather than the "how". You can always sort of bring this home to parents by pointing out if they were talking to their spouse and wanted to tell them about an upcoming event they're going to and that the spouse kept correcting the way they pronounce somebody's name, that would be discouraging and annoying. And so I think if that's -- if it's discouraging and annoying for adults, even more so for children who are really trying to get something across.

We want to encourage all the caregiver skills that you see here, particularly also encouraging babbling and vocal play, even when that babbling and vocal play doesn't sound like discernible words and we want to really encourage them to limit the times they elicit imitation or make repeated requests for specific productions.

This is something that parents do with children with all sorts of challenges and learning challenges. Lots and lots of research shows that parents tend to overdo this elicited imitation unless they're getting very sensitive and appropriate coaching about other kinds of responses.

There's some very recent research that we want to draw your attention to. It just came out this month in the Journal of Pediatrics, by Alexandria Quittner. This is a national study of 188 children with profound hearing loss who eventually all get cochlear implants or are candidates and they looked at children from 5 months to 5 years and they have been looking longitudinally at those aspects of the children's development that are associated with greater language gains. And they found that parents that exhibit high sensitivity, all of those caregiver characteristic that we have talked about, have children who have language gains that are significantly more advanced than parents who don't use those particular skills and who aren't emotionally tuned in to their children.

So what do we mean by sensitivity? It's handling the child in a positive manner even when that handling isn't communicative we're looking for that bonding and responsiveness of parents, pacing in sync with the child's tempo and temperament, following the child's lead, rather than using language to make them focus on something. Providing the language that the child is focused on and engaging in developmentally appropriate activities and activities that stimulate them cognitively as well as linguistically and provide lots of practice in social interaction and again, being responsive to any attempt to communicate.

So I'm going to let Jan wrap up.

Jan: Thanks Barbara, thanks Elizabeth. So in conclusion, you can read your list in front of you. We want you to know that the message from this talk is that children need to hear to speak. And that really refers to good acoustic access really. They also need somebody to talk to them. A really interested, invested, adoring speaker which speaks the issue of social, emotional developments and awareness. They need to have something to talk about, which is where cognition comes in. They need to have a role model and something they want to convey that's important and a system to reference with their symbolic language and they need a reason to talk which is about motivation and you need that anyhow.

So thank you very much for coming today. We hope to see you again soon at our last lunchtime performance and the topic then will be family centered practice for infants and toddlers with hearing loss. What have virtual home visits have taught us about coaching and family intervention. These Webinars are sponsored by a foundation that is also helping us experiment, not experiment by really systemically go about doing some distance learning with children and doing some telepractice - providing family centered intervention at a distance - so we want to share what we have learned about that.

Anybody who -- that will be on Wednesday, June 5th at noon.

I just want to point out, it's EST but it's actually daylight saves time. If you want a repeat of today's talk "How to Infants and Toddlers with Hearing Loss Learn to Listen and Talk", it will be archived on our website.