>> Donna: We would like to know a little bit about you and whether or not you're using the captioning today so we have some polls up there for you. So if you would just take a second now and fill those out. We're anxious to know if you're using the captioning. We would like to know who you are, if you're a professional or if you're a parent of a child with hearing loss. So there is three little poll there is if you would just go ahead and fill
them out now. Okay, just a bit more information until we get going. Just to remind everyone that we will be providing captioning and the information is up there about it today.

If you know someone that wants to take one of these courses in a recorded fashion -- and we will be recording this -- we do make scripts available from the captioning transcripts so we can make that available to someone that needs it to have the session be accessible.

We will be offering CEUs from both ASHA and the American Academy of Audiology today. And that will come from your computer just a few hours after the session ends. You do need to be logged on for the entire session time to be able to receive CEUs.

The other thing I just wanted to mention is that we have many, many courses that we have given previously and recorded and archived so if you're interested in this topic on Baha, you can go and take those. I think there is four previously recorded Baha sessions. There is also over 60 courses on different aspects of rehabilitation for children and also for school-based issues, things for parents. And we're setting up a new set of courses on rehabilitation for adults with implants starting next week on the 23rd of October.

So please take a look at those. If they're of interest to you and I also just wanted to mention that there are handouts for today. And if you look on the left side of your screen there is a file share area. And the first handout listed is the PowerPoint presentation that Lisa will be giving today;
the second is a feedback form, so I recommend that you go ahead and save those to your computer now before we start and then you'll have them -- the feedback form is something we would love for you to return to us. It gives us an idea of what you thought of the session and what else you would like us to be presenting on and it is also the trigger for you to receive a certificate of participation that many people use for CEUs. Please go ahead and download those.

We've also got up there on the screen the HOPE website area within the Cochlear America's website and it is www.cochlear.com/HOPE and if you need any information on these online courses or take a previously recorded course or sign up for courses that are going to be given live in the future.

We've got the polls up there and if you would just go ahead and fill those out now and we'll turn that off probably in just about a minute.

Okay, I think we're about ready. Why don't we close down those polls. Let's start our session for today. This is Donna Sorkin from Cochlear America's HOPE program and our session today is on pediatric Baha Softband implementation. Our speaker is Dr. Lisa Christiansen from Arkansas Children's Hospital. And I would just like to say a bit about Cochlear lifetime recipient to our community and these programs and other offerings from HOPE are designed to support you as professionals who work with adults and children with implants. But we also are expanding our HOPE program to include programs for parents and adult recipients and, so, I hope that you will let your patients know about those.
In every case we collaborate with the very best people in the field to bring you information and support that you need because we know that doing well with an implant is more than just getting the technology.

With that I would like to go ahead and introduce our speaker today, Lisa Christiansen is a pediatric audiologist at Arkansas Children's Hospital. She's been there since 2002. That is a lovely picture of her so you can have a visual of what she looks like as she speaks to you today. She is the Director of the Baha team at Arkansas Children's Hospital and she's really one of the most active pediatric Baha audiologists in the United States and we're really thrilled that she would be with us and present. I think the other thing that is kind of neat about Lisa, she's an up-and-comer in the field. She was recently selected to be a participant in the Future Leaders of Audiology Conference that is being hosted by the American Academy of Audiology. With that I'm going to turn the floor over to Lisa and let her lead you through Baha.

>> Lisa: Thank you, Donna thank you, Melissa for helping me to set everything up. I was glad to see most of you work with children so this should be a lot of fun.

I want to take you just a little bit through some Baha history and just a couple of general things about pa. And if you do a lot of Baha bear with me a little bit because I have questions about how it works and will it damage and things like that based on probably a history of working with CIs bear with me if you can.
Baha has been around since '77 and it has been around for over 30 years at this point. It is the only implanted hearing treatment that works through direct bone conduction and that is very important to convey to parents. It is important to be conveyed to them so they do understand that it does not enter the middle ear in any way.

Sound is conducted through the skull bye-bye passing the outer and middle ear and stimulating the cochlear directly, there is three parts, the titanium implant, external abutment and the detachable sound processor.

And here are those pieces. You can see them now. You can see the implant that looks like this screw there, the abutment which is the cone-shape and they want external processor which that one just happens to be a Divino.

And here is a picture of the Baha implanted. And as I said before, most parents, even a lot of other professionals ask does it enter the middle ear? Does it destroy anything? What if 5 years from now there is something better, all those sorts of questions. We always try to show them a picture so they do understand that it is just there in the bone. It does not enter the middle ear. If for any reason it was taken out it would still be okay. There is no damage done.

And some indications for Baha. And chronic otitis media, obviously with the underlying conductive component that we cannot rid ourselves of not just for every otitis media case that we see as pediatric audiologists and also congenital atresia and cholesteatoma and middle ear dysfunction
disease and otitis externa and what we'll talk about at the end is unilateral hearing loss in children or single sided deafness. Some things to think about and when you might want to use a Baha on a child.

This is your FDA indication criteria for Baha. To have it implanted, implanted only, they have to be over 5 years of age. Now, there are some facilities within the U.S. and around the world who do that a bit younger. At Children's Hospital here in Arkansas we are sticking with the 5 years at the current time. Because we have found that 5 years makes our search and feel a little bit better about how thick the bone is and how well it is going to stay in. So we do wait the 5 years at the current time.

there also needs to be a bone conduction per tone average that is met, greater than 45 for the Divino and greater than 55 for the Intenso and greater than 65 for the Cordelle.

One of the other things that we have to look at is for bilateral fittings and we'll talk about that later but we do bilaterals quite often so for those we have to have symmetrical bone thresholds less than 10 dB difference between the two ears.

Here is our typical surgery protocol at Children's Hospital. We like to do a two stage surgery. We install a sleeper in nearly every case that. Sleeper is simply just a second implant to be uncovered and used should anything happen to the primary implant or the abutment to be entered. We have had two accidents that I'll tell you about. We have one child who had some vestibular problems, and we'll talk about him in a minute. And he
has knocked his out and is not using his sleeper now. And older kids who we have not done that.

We do a full six-month waiting period between the two stages of surgery for proper osteo-integration. Older teenagers that we've had, we've actually done a one stage surgery and then had them treated more as an adult if their skull thickness permitted us to do that.

We typically fit the processor on their two week post-op visit and we do still sick with the criteria of 5 years or older for the implant.

For the implants we do like to look back and think a little bit about history, especially for those children with the unilateral or SSD and some of that we look at, was that hearing loss progressive because we want to know that before we start to go and put the Baha on and then realize that maybe the ear -- the good ear is going to drop. We also want to know is it sudden and could that happen to the good ear? Every child gets a CT scan. We're checking for other inner ear oral middle ear abnormalities and large vestibular aqueduct or anything that would give us a sign that it is not neutral and we make sure we don't have any other indications that permit us from putting a Baha in.

One of the most important things though that is the family and the child must be motivated. They must be motivated to keep that area around the abutment clean either by the child or in the case of some other children that we have some Down's Syndrome children they can either do it themselves or they're going to have a parent or caregiver around to help
them. That is one of the big things that we look at.

And the other thing last but not least and definitely important is that we have to have an agreement between myself and our otologist. Typically we agree on things and we have not had a disagreement on things yet so we'll see.

Real quick we're going to talk about the sound processors that are currently available. And right now we currently have two that we use the most, the Divino and the Intenso and we'll talk about those. I have lots of exacts out there that were form early on kids that we still have up and moving and I have a lot in loaner stock so there is a exact out there if you see that and there also is a Cordelle that is a body warn. Primarily we use the Divino with and there is decibel technology. I tell people a lot of times think back to the first few hearing aids that were digital. They were not plugged into Noah but they had digital signal processing and it is the same thing with the Divino. It has two on the back that control gain control and tone control and then two microphones for omni and directional. And then you have your colors which are black, blonde, silver, grey and brown.

Here is a little bit about the sound processor. If for the programs omni is a directional microphone is down I tell parents it is like a light switch on the wall. If you flip it up it is on. If you flip it down is not off like a light switch but takes to it a directional microphone mode. When we start to see some of the cases I present later a lot of my infants and toddlers wear the processor on a Softband and a lot of times up around the forehead instead of back on -- back behind the ear. So a lot of times that
directional microphone if it gets bumped we can pick up things on the opposite side of the room, things that we're not really looking for and so it is very important to teach parents which way is right and which way is wrong and how to keep that there. I have a few parents that kind of tape it to where it should be.

And then the next processor would be the Intenso. It is in size and a lot of parents and families like to look at the size. It is a tiny bit larger than the Divino. It is larger and it has a little bit of extra power and also has the signal processing that is digital and we currently use this for mixed hearing loss and single sided deafness. There are two big pulls for that and also use it in the office as a tester.

So now if you knew all of that here comes the fun stuff.

This is a program that we've had since 2003 when we started. We have about 85 children wearing devices. That is 85 kids. We do have about 25-30 bilateral implants so it is not ears. Just strictly children. Also have a handful of kids who I call temporary who probably will not have the Baha implanted and are wearing on a Softband as a temporary measure. One of those cases in particular is a child who is in first grade. Having trouble reading she has bilateral perfs and we put a Softband on her until we can get them surgically repaired and that is one ear is repaired now and second one is about to go under. She's a temporary kid and is not in this 85.

Let's talk a little bit about Softband. When I lumped all these
together let me tell you where we're going. I look at them in three different situations: There is Softband kids, then there is implanted kids; and then there is my unilateral kids and that is how I keep them in my head balanced out. These are the Softband group kids. Everybody wants to know is when the earliest you can fit. The earliest I fit one is two weeks. I fit them in the NICU with a loaner device after doing an ABR there on the floor. As early as you can get the correct data. And we use them on conductive and mixed hearing loss. Typically these are the bilateral kids that we put Softbands on. I do have a handful of kids who are unilateral infants and if you -- grade school children that are unilateral that wear Softband. But there are few and far between. Most of the ones that wear a Softband are definitely either going to one be implanted when they're 5 years old or have some sort of other surgical intervention at 5. They're typically my bilateral hearing loss kids.

Let's look at a few cases of those with a Softband. This is William. Bilateral arteries ya. you can tell he was born in 2005 in February. And in March we fit him -- we did an ABR on him and fit him with a loaner there in May.

Let's look at some of his results. Here are his aided and unaided. These are his Bahas and you can tell he does really good aided with that. A cute little thing, too. Look at those arms.

Here is another one, here is Evan. He is wearing actually a test unit there. He broke his. All of my kids go through a phase where they like to eat the Baha at some point. They find it as a chew toy and that is the
stage he's in right now. He was born in March of '07. He failed his newborn hearing screening. We rescreened him at Children's Hospital and he failed again so we did an ABR at three months and he was fit with a loaner at five months.

You can tell he has a pretty good-looking pinup but once you get passed a little bit of the canal there is not much to work with. So we probably could have tried a BTE with him. But we gave the parents an option and they chose the Baha over that.

It took us a little while to get his funded set up but he now has permanent Baha and they were fit on him at 11 months and he wore the loaner unit that I have for this six months in between.

And here is his audiograms. You'll notice that typical, you know, moderate, severe conductive loss and nice looking aided over there with his Baha on the Softband.

Here is one other one. This is a little bit more of a typical thing that you would see. William, you know, is just pure atresia no other syndromes. Evan, you know, had just the -- also atresia and then Haven, who we like to say the kids with Pierre Band and the ones with Treacher Collins they were made with them at this point.

She was born in December of '06 and failed the newborn hearing screening. They have given her the diagnose of Pierre Robin sequence and she had ABR at three months and eight days and show you how great
we were with her great parents. Conductive hearing loss in both ears. She was fit with loaner Bahas just days later. She now wears her own. A little bit of data on her, too. You can tell we're getting really good results with the Softband.

This is one of my favorite kids to put a Baha on. This is Oriana and she is older but still wears a Softband. She has Down syndrome, chronic otitis media and she has had PET placed a couple of times and the conductive loss remains. She's being raised by yes that is a great-grandparents and she was fit with a Baha in 2006 because the grandparents were concerned about school and she was self-contained. We tried some Soundfield things in the classroom but they were also concerned about outside of the classroom how she was going to function with this fluctuating moderate to mild hearing loss. And this is why I love putting the Baha on her. She is having normal bone conduction line but I put the error results on here to show you how much she fluctuates from when to when. This is four audiograms taken three months apart over the last year. And so if I had BTEs on her, I would be constantly worried about was that overamplifying, underamplifying and wanting to see her a little more frequently than I do now just simply because of how would I adjust that?

So with the Baha on, I know that we're getting direct bone conduction with the Softband and I'm not worried about the otitis media fluctuate from an audiological standpoint or medical standpoint. She is followed up by an ear, nose and throat physician but from my standpoint I can take a little bit less aggressive approach to her, seeing her a little less
frequently than maybe I would have to watch for all of this. She's a great Baha wearer.

Here she is across the board with the Softband on. What we decided to do was we looked back at a case -- at a study, the only previous study on Softband that had two children in it. I thought, you know, we could redo this relatively easy at this point because we have so many kids we follow with it. We went back and over 35 charts entered the children between 2003 and 2006 and came up with 26 children that met this criteria.

One, we wanted them to be at least eight months old to 16 years so we know we got a good reliable test on. They our mean age ended up being a little over 5 years. The inclusion criteria for us was bilateral symmetrical conductive hearing loss. I didn't take any mixed kids into this or unilateral hearing loss.

They had to be fit at our facility with the Baha. They had to be full-time Baha users. And we wanted to follow them for six months or longer so that we could make sure that these results are accurate. And a little FY this has been submitted for publication and it was a poster a couple years ago at audiology now.

Here is what we found just on average unaided versus aided thresholds. You can tell we went from 65, 60, 55, 45, down to 19, 17, 16, 22. So some nice -- definitely nice aided thresholds.
Now, that brings to us our next kind of cluster of kids which are implants and a lot of people still ask us do we need to do two implants? Our bias is yes. We do like to do two implants for two years. There is a lot of adult studies and this one you can see here where 25 patients were evaluated. They were all adults. There were a couple of outlying younger kids many there is a 12-year-old in there. All the way up to 69. And their criteria were at least three months of experience with bilateral Baha implants and that they had symmetrical bone conduction results.

In this study they used the Baha Classic which is not manufactured any more so the equivalent of that right now would be the Divino.

So here are their results, and they found better localization skills, better speech and noise skills, better binaural masking level difference. So their conclusions were that, indeed, it did result in binaural hearing to an extent. So as much as they could tell it gave goodbye all in results.

What do we do with our kids here? Since we're a pediatric only facility we only see children, we do implants that are all bilateral. If we have hearing loss in two ears at this point we implant you from the very beginning with two Bahas. And, now, there are some other -- there are some children that medically we will not implant them with two. We have some patients with shunts and other things that we have held back on implanting the other side at this point. And on the flip side of that we also will do bilateral Softbands. You can order those from Cochlear or if you are like me and like to be a little creative on the side, you can actually phalangal yourself and do your own. That is what I did the first time before
Cochlear started carrying them I took two and sewed them back together like they should have been for bilateral. If you like to do crafty things like that e-mail me afterwards. I always like a little craft project.

So here is a few cases from our bilateral kids. And this is Christine. She obviously has Treacher Collins and she’s about to play college basketball and we’re excited for her. She was first implanted at another facility. Prior to 2003 when we started here in Arkansas she was implanted somewhere in Texas and she received her second implant with us about two years after the first. Currently she wears Divinos. She came to us wanting the second implant. After she saw we actually did those at that point they came in looking for the second one. So here is an unaided for Chris. And here is her aided.

So what I’ve had her do a lot of times is because the minute she put them on it was me and her Mom and some media people from her hospital and she put both the Bahas on after the second surgery and immediately turned them both down. I kind of gasped, you know, being the nerd that I am and uttered under my bread it is binaural summation. It exists. Our surgeon laughed and said you’re right. It was a very eye-opening experience to us to have her. She's very articulate and tells us exactly what it is like with two. She's one of the first bilaterals that we did. She loves it because she can hear better playing basketball and can localize better. That is her perks to having them.

And this is her aided and unaided -- I mean her aided scores. We did right and left and then bilateral and you can tell it is bilateral is better.
Something that we've known for a long period of time when working with hearing aids and working with children and adults and I think that we just sit and realize that the brain was capable of doing that with bone conduction also. Here is some more information about her.

Now, we do a lot of thing with these kids a lot of HINT and we are set up to do Soundfield and ERA. We're not set up with a big speaker but a lot of my patients leave kind of dizzy and I have them pause, turn around and then I do one then the other and then both and they're teenagers so they love me when they leave. But anyway this is what she looks like on the HINT.

Plus we did one Baha, right, left and bilateral. You can see her scores there as they do improve with T1, 80 and 82 which is unilateral fitting and then 91 with both of them. We've done that several times with her because I wanted to make sure it was really true. Every time she comes in we make her do all kinds of crazy stuff. She enjoys us, I think.

Here is another one. This is an Andrew, I told you he's using his sleeper right now. Andrew has Di George syndrome and he is 6 years old and he has a mixed hearing loss. The mixed hearing loss kids r that we have really been focusing on for the past few months looking at how they're doing with the Intenso. He has had BTEs for quite some time and you can tell this is a picture to him prior to implantation. But the problem with his BTEs were that his pinnas are malformed and it is hard to tell on that picture but you can tell they flop down on one side. It was very hard. Even using what I consider some of the best feedback mechanisms on the
market and hearing aids to keep the feedback from being there.

The feedback obviously drove us and his family crazy and he's a very compliant little kid for the most part. We had him try several different things. And eventually once the Intenso came out we knew this was the perfect thing for him.

Now, with that said, he has some pretty terrible balance vestibular problems. He falls a lot. Runs into things a lot. He has tons of repairs on the Bahas. But his family is much happier like this and he's happier. The first day that he came in and we put the Baha on him I had the Intenso shortly after it was released to the market. He loved it. He threw out a fit and he did not want to leave with it me. He wanted to take it home. Being I only had one I couldn't let him leave with it but he knew from the beginning it was what he liked. So we used it on the cab. A bilateral Softband for a long time with him until the implants were there. Now he has a -- an Intenso.

Why she's using his sleeper is he apparently the push on the door, the little handle on the school door that is like a long metal bar hits him about the level of the Baha and he has hit his head on it a bunch of times walking in and out of the doors and one time was the last time and he kind of popped the whole thing off at this point. But you know it is amazing we've had that a couple of kids have accidents and their only questions are when can they get it put back in which surprises us the first couple of times that something like that happened. He's ready for it and he's had the second surgery to get everything fixed back again.
Here is Andrew's hearing loss. Top left there. It is unaided. The bottom left is what he had with hearing aids on with BTEs and we probably could have got that up a little bit more but the feedback was a bit unbearable when we did. So that is the best that we pretty much got him in BTEs without any discomfort from him or the family or anyone else on feedback. And then the bigger graph there, the bigger audiogram is his Bahas with the bilateral Intensos on.

And the next kid, this is Erin. I put her here but she is not implanted at this point because she is too wrong for our criteria but she's going to be in the first group of kids that -- she's actually had a birthday and turned three. She's going to be the first group of kids we for him from birth using the Baha. We have a few of those. We're very excited about following them because we diagnosed her at four weeks of age. She has teacher Collinses syndrome just a few arctic you lit issues but most of that is due to jaw structure.

She has warn a Softband from that time of four weeks and when she got big enough to get up and walk around, which is my criteria for letting them have bilateral soft bands, once they're up walking, moving, not rolling around on the floor as much, then we move to the bilateral Softband. And you saw some of the other kids. They do wear them in kind of bizarre places. You can tell she wears hers on the side of her head don't. Move it. She'll move it back if you move it. They have the Softband where they like it most of the time on these little kids and I test where they are and if it looks okay I don't argue too much about where they put it.
Here is her results. And what I did was on the right there that on audiogram you will see the red Bs and we have capital B for Baha. It is on our legend. And those are with the bilateral. The black Baha symbols below are just with one.

So that brings us to the third group of kids and who I always have the most amount of questions about. Which are the kids with unilateral hearing loss and we mean unilateral conductive and sensorineural. You all have known definitely since 1986 since the mid 80s thanks to Bess and Tharpe that children with unilateral hearing loss always tend to have trouble in school.

With the statistics here being 35% fail one grade and 13% are in need of special resource assistance. 20% described by teacher as having behavioral problems and 50% showing some sort of educational difficulty.

So the question is always been what to do. And we have tried on all of the kids that we see like this we do personal FM in the form of like micro links and Soundfield system, preferential seating and just like any other audiologist in the world we have tried many of those things. What we found to be the biggest hold up in all of those things is that each one of those three things if you use personal FM, Soundfield FM or preferential seating that is shows are very classroom specific. It doesn't do a lot of good for those children outside of the classroom. So that has been one of the biggest complaints is that they may be doing okay in school but they don't do well at home. They don't do well outside of school activities
because those things are all very classroom oriented.

So most audiologists found some of those things may or may not help them. And so we're very excited when we saw that adult studies have shown improvements in patient satisfaction and increased speech recognition in noise. So we decided that maybe it was time for us to look at a few kids.

So one of the biggest things that I think is very important to tell all of the families of these children is that the Baha does not cure or fix their hearing loss. That is very important to get across to them from the very beginning. Because that sets up a very high expectation that this is going to fix them and when it doesn't completely fix them, then we look for some really negative affects. So it is very important that we tell them that up-front.

I describe it to the kids as a trick. It is a trick on your brain. It is a trick and what we normally do is we do a trial with an Intenso on a headband in the office. With the little kids and really with the teenagers, I typically don't let them take it home overnight or try for it weeks at a time. Just because that metal headband hurts. It does hurt after a while. It leads sometimes to a negative experience for the younger kids because when they think back about it all they think that is thing hurt my head. So I typically don't let them do that unless for some reason there is an exception to a case. But typically what I let them do is wear it around the hospital for a little while. A nice gift shop that has toys they can walk up, look around and see what they think about it and even sometimes they can
just sit on the floor, the younger kids, kind of play with toys while I talk to
the parents and I keep saying I'm going to do this and I'm going to do it
soon but it is really funny to try it on the kids when they're little and mostly
it is the younger elementary age like 6-9 that will be sitting around playing
and I'll be talking to the parents showing them the brochure, showing them
what it fits, what it looks like, what the surgery involves and every one of
the kids reaches up and sticks their finger in the good ear and they get this
really shocked look on their face because they didn't think they could hear
out of that ear and it is always a funny thing to watch. I get real tickled to
see them do that but every one of them does it.

Obviously from just the trial it gives them some sort of perception
that there is sound on that side of the head that. They once didn't have.

Let's look at a few of these cases. We right now at Children's
Hospital in Arkansas we have about 25 kids that we follow for single sided
deafness that we have the Baha on. So we have a nice group of kids.
And something that we feel is a good mix of kids to work with. So we feel
like they're getting great results. And now this is Justin. Justin is -- he was
born there in 1990. We followed him for a long time. Now his Mother
noticed his hearing loss when he was three. She said they were in church.
And he was coloring. And he said something to her like what color do you
think I should make this and she said well make it green. And he looked at
her and he said oh no way. You can to talk in my other ear. I can't hear in
that ear. So obviously she was a bit mortified and started to take him
around to get his hearing tested. And we found shortly after she took him
in that he yet indeed did have a very profound hearing floss one ear. He
used classroom amplification until about the sixth grade. And then he started to change classes and he'll tell you, one, it was not very cool to have this equipment in the classroom and, two, he didn't really have any benefit of it when playing basketball when you see him stretching nearly from the rim to the floor. And he kind of quit at that point.

In 2007 he came in and we did a little trial in the office. He immediately liked it. Parents were excited about it. As for us at the time he was one of the first three that we did. And he was ready to have it done but unfortunately we got stuck in a little bit of a funding problem. We have a nice generous Medicaid system here in Arkansas and unfortunately he didn't qualify for Medicaid. So it took us a little while to get around and get some funding for him to have the surgery done.

So here, this is audiogram. Profound loss in the left ear. Nice and normal on the right. Sorry about that. And so as a measure before I like to give them the child. If you have never given that it before is developed by Karen Anderson. There is a parent version and a child version and it just assesses how your child hears in everyday activities. There is 15 items. You give them a score of 8 to 1, 8 being great and 1 being not great. There is what they call the understand0 gram and is on 5 and okay but not easy all the way down to one. Huh? It helps the kids do a little bit better job of looking through and knowing what it is instead of 1 to 8.

The bottom there is Karen Anderson's website. And that is where you can get a copy of these outcome measures if you can one.
Something that I've done in the last few months is I've taken it and kind of made it electronics if you're interested in looking that the I would be glad to pass that along to you. In the error of being green I thought I was using too much paper by printing them out and I thought it would be one where I would have to do the math every time and two it would be a little greener with less paper.

So here is Justin. This is what he scored preop Baha on the child. You can tell there is all of the situations there along the side, questions 1-15. A little bit more detailed on the real form. It doesn't say listening from the back seat of a car. It gives you a situation for the child to read. And you can tell his Mom there is the Mother that filled this out. Gave him an average score of 4. And he gave himself an average score of 3.5.

Now, here is post-operatively. This is a month after having the Baha. He gave himself a 7.0 and Mom gave him also a 7.0, so a big jump there in his perception.

Obviously one of the things that he shows a lot of improvement on is being called from another room. They all have a big jump on that one. And being in crowded places they're spoken to from a large -- a cross a large room. He has perfect scores of eight on both of those.

Now, here is some hints and it says before. Now, in this particular case I rolled these around a little bit. They all have generally the same scores, same range of scores across each of the kids that we see. But I
kind of did some different ones on here so you would have an idea really that I do spin them all kind of ways to get the score. But pre-op is O ratio and post brought him up to 81. Plus 10 post is 100%. You can see some nice results there.

And this is what really strikes me the most, especially on these first few cases. I would sit down and talk to the families at great length because for one thing you know we still just sit and realize how -- we were shocked I'll be honest, we were very shocked with how well they did with them, how well they did with the Baha. And so we would take a lot of time sitting with them asking them what they thought about it. Justin's Mom made the comment, you know, about they didn't know the sound that he couldn't hear and that she's been a really good person for children with younger or families with younger children with unilateral loss to talk to because she did wish that they had it earlier. She realized there are a lot of years that have gone by he probably would have done better in school, probably would have been a little less harder for him in certain situations. She's a great person that lots of our family members now get to talk to because she's become a very big advocate for us.

Now, Justin thinks more like the teenager boy. He thinks in the aspect of, I play basketball and before he was telling me that he would -- the coach would call for them to come back and -- or come, meet on the side of the Court and he would just keep running because he never heard him. And so now he says, you know, I hear him the first time he calls to me. Whereas before I wouldn't hear him until I got down to the end of the Court and stopped and realized I would be the only person down there and
it would be embarrassing for me because I didn't hear him. But now he likes it because he does hear the coach the first time.

He also has a really incredible localization skills from some informal stuff that we have done in the clinic and that is our next project to look closer at that. Localization skills with our bilateral implants and with these SSD kids.

I think probably the biggest thing that Justin's Mother has said to me that impacted me, she said, I know he's a teenage boy an doesn't talk about things much. But she said the one thing I do know every day he leaves the house he has the Baha on. I don't think as a teenage boy if it didn't work that he would put it on every day. So that is his biggest testimony that he actually does wear it.

Here is another case. This is Marvin. He's 16-year-old, also. He has a normal right ear and profound loss in the left ear. He was not diagnosed until age 11. He's never tried any other kind of amplification. However, just to kind of go back to some of that data we looked at for other kids from Bess and Tharpe is that he was held back in kindergarten. Now, Mom said it was her request because she felt like he was a little immature and then Dad has profound hearing loss in one ear and they said that was caused by him getting a rock stuck in his ear. It makes me think that okay maybe it is genetic and maybe it has been there and it was just not caught. So that is Marvin's history.

Here is his child pre-implant. Mom gave him a low score of 2.86 and
he scored himself 5.33. And you can tell that call from another room that
gets them every time. It is always way down one or two.

And here he is at one month post again. With an average score of
seven from the Mom and 7.2 from him.

And so with him the score that I put on here for his HINT were
scores where I did speech out of one speaker and noise out of the other
speaker and I had him kind of twirl around in the room again to see what
can happen. This is fetched speech coming out of a speaker in front of
him -- this is speech coming out of him at 89 degrees and one at 80 and I
just picked and chose a few of them so I wouldn't bore you to tear this
afternoon.

Preop before Baha he has 21% and HINT 98 and most of the kids
that is normal along the same pattern and then they do pretty good +5 is
kind of hit-or-miss how they do and some kids do good and these are far
and in between. By the time it gets down to zero we have some lousy
scores.

Post-op here he wears a Divino and this is for him and Justin. There
was no Intenso at this point when we did these and he is 69% up from
21% and then 100 at plus 10 up from 98 which it can't get much better with
98 there.

So then I decided well let's look around the room a little bit. See
what he stiff we look at some sort of head shadow by giving him noise and
the stimulus to the bad ear. So at zero dB signal noise ratio he had 57%. With the implant we brought that up to 77. Of course with the noise and the bad ear and the stimulus that extends from the HINT of course he was going to do great. I wanted to show you yes he does know how to answer the sentences and he does know how to get the test. There we go with that.

One of the things that I get asked about a lot is do kids mind the way it looks? Do they want -- do they want it? Do they have any sort of problems with the cosmetics of the Baha and I always say no. They really don't. Most of the times when we put it on the kids they're sold with it from the first time they hear it. You have some parents who drug around a little bit wanted to see them on different thing just because "they" definitely want their child to look it and not regret that they have gotten it.

So I did put Alivia in here because her results are typical with everybody else we looked at but two she's an aspiring model. You can tell there she's in a little shot here of some fashions that she's done. She would like to be the Baha model and I wanted to talk to Donna about that. That was her criteria for putting her picture in here the fact that she would be a great model for Baha. She has left sided single sided deafness and diagnosed at three. She repeated kindergarten and requires tutoring in school, lives with the grandparents. We implanted her at 14 years of age. And so here is her results. The pre-op for the child before the Baha. She had results of 3.8. And her grandmother scored her at 4.2. HINT results were similar to what I was saying before SNR around 91 and 50% and then at zero we get her down to 11. That is typical of the kids that we have
So these are her post-implant scores. And so up there 7.0 and 7.0 back from the 3.8 and 4.2. Big jumps there. HINT results from 91% at +10 100 and then from 50% at +5 to 96% and then at that zero where she had only had 11% before she’s up at 92. And I will say that her results are a little bit greater than the few that we’ve done mainly in the fact that her pre-op scores at that zero SNR was lower than a few that I've seen. That she's doing great with those.

So what I want to say about the kids with the SSD is that a lot of times I get a lot of flack because there is not any research out there. But obviously since we have these kids we have a better research and there will be an article that I and the physician that I work with, John Dornhoffer wrote it has been accepted for publication and it should be ready to roll sometime and we're thinking December. There is a little bit coming out on that.

And when I go over just a few little conclusions then I'm going to take all the questions that are popping up down here. Baha cab we definitely think is a proven way to treat conductive hearing loss and mixed loss prior to implantation and prior to implantation. We have a few kids who have some heart conditions, some medical things that we're not going to go into just to implant a Baha to put them under sedation. We're not going to let them wear the Baha at 12 or 13 like some of them have. Particularly they're mixed loss and have worn hearing aids in the past. We're going to let them wait until some other reason they're going to have
surgery. We don't want to risk them just for the Baha at this point. That is another option.

If you're in a smaller medical system sometimes that is not as easy but if you're in a system like we are, we're the only pediatric hospital in the state in the six largest in the U.S. so we see a lot of kids and a lot of times we go tag on surgeries and something to think about.

We also when the article has been submitted so if any of you are having trouble with reimbursement we stuck a little perk in there how this is bone connection given the results that we worked on and we do feel that it is a proven way to treat it and definitely a treatment of choice so if that helps any of you when that rolls out hope fully it is soon.

Also, we look at Baha in the sense that there are many other implications than just complete atresia. We joke, I'm like you know it is whatever the commercial it is just not for breakfast any more. I say Baha it is just not for Treacher Collins any more. There is a lot of viable things out there especially the mixed loss that we're looking at that Baha is definitely better for and we found it is definitely better.

Bilateral implants definitely appear to have the function of two ear for us at this point. We're very excited about that. We're very excited. I'm very lucky to work with an otologist and it took a little prodding to get him to do that. But also our -- we do think that the Baha is a viable treatment for single sided deafness and unilateral hearing loss given the results that we've had so far. There should be more data on that and I have submitted
some stuff to audiology where I have looked at SSQ and some other things. So if you have more of an interest in that I would be glad to tell you some other things that we found on it. And I included just a little bit of some references here so if you want to go back and look at them you can. And then indicated the two things that we have pending out there. Donna, look at that I think I have 30 seconds to spare.

>> Donna: Okay. Thanks, Lisa. There is lots of questions for her to review. While she's looking those over I want to -- we have some online events coming up. As I mentioned earlier we are expanding into providing online courses for adults and our first one is coming up next week on the 23rd of October. It is offered at 8:00 in the evening. Followed up two weeks later with Kris English on the psychosocial side of facing hearing loss and then we have coming up on November 11th with Ashley Garber on learning with literacy. That is a parent and professional event. So you might just want to take a look at those if you're working with adults or children with cochlear implants

And then upcoming HOPE Live events we have those that involve rehab for adults, widely listening as well as a day long intermediate course for professionals working with children and those are in four locations. Our first one will be November 17th and 18th in Albuquerque, New Mexico, and our featured speakers are Teresa and Joanna, Hearts for Hearing in Oklahoma. Those are some of the our live events. You can keep up-to-date on those by just looking in the HOPE area of the website. And for additional information on this course Lisa has kindly shared her e-mail address so it is right up there. If you have any inquiries on HOPE. Please feel free to contact me. I have given you my e-mail. And then the
feedback form comes back to HOPE feedback. With that I'm going to turn the floor back to Lisa to answer some of these great questions.

>> Lisa: There are some great questions on here. Let me kind of roll down a little bit with you. First of all I do the preferred placement for the Softband is on the mastoid on the ear closer to the cochlea the high frequency there is a little difference when they move it around on their forehead but unfortunately when we work with very small infants, we're not going to get it back there and keep it there and fitting it for weeks, four weeks, we're going to have to move it around a little bit. So preferred definitely on the mastoid.

Definitely no the Softbands, I'm going to be honest I have not had a hard time trying to get those. But I did have kind of a stockpile. I'm not sure but Donna can tell you when we expect to get some more of those. At what age do we use a child -- I tell you I can get an eight-year-old to sit down and do that independently. Before that, no. I sit down and talk them through it. Definitely don't recommend you handing it to a 5-year-old. But I have the most success in about 8 and older.

One of the questions is the sleeper. The sleeper is just a titanium screw. If you look back to that picture where the Baha is sectioned down into three parts, what they do, they take the implant, this is just a little titanium screw. They put two in instead of say one. I think Donna is going to back us up to it. So we put two in there so if one like in the case of Andrew, he has knocked one out. Then we don't have to go back and put one in say another implant in, wait six more months for osteo integration and then he is off the air for six months ago. We have two that are in there
and ready. What we do is go back in and open up the second one and screw about the other one. We have done that in the office a few times on some of the older kids. Andrew is probably not going to it for that. He's still too little but we've had some 12, 13, 14-year-old that we have gone in and actually put in a longer abutment in the office and things like that. It is really a time Xavier.

I'm just going through to make sure. Our Medicaid, state Medicaid program, yes, it does pay for bilateral Bahas. We're very lucky.

Then there is a question about children with SSD on the right ear have not done as well as the left. I had theory bill of sale that, too, who would do better. Would it be right ear or left ear. Everything that I have to date I have a little bit of mix of both. And they're doing equally as well. It is still something obviously that we need to get many more kids implanted to tell for sure but with the 25 that we have they all look about equal at this point.

Personal FM for unilateral and bilateral, I do. We also get FM with our Baha through state Medicaid. With the unilateral kids some of them are asking for it because they're used to wearing it from having things like edge-u-links or other FM and I do go ahead and order for it them and a lot of them do use it. Definitely with the bilaterals we use it. Typically those unilateral kids are the ones wanting to get away from using the personal FM which is why they're moving to Baha. I don't often do those as much.

Unilateral atresia experiences are as good as the SSD kids that I
just showed you. They're all as equal and HINT, child and other outcome measures and so they tend to be just as good. We started out for whatever reason with SSD that are sensorineural and we took profound only. We took older teenagers to start with, just as a preference between us so that we -- the surgeon that I work with and I knew where we were going. We had a good, clear vision. We had good reporters like the three that I showed you today. Then from there we have gone down to other kids. We have 5-year-olds now and some conductive that are unilateral and other things. But we started out kind of big.

Actually one of those that will appear in otology is a neuropathy that we implanted and strongly enough she's done as well as purr sensorineural, too. and can we do a Softband for an infant with single sided deafness? Yes, we can. And the problem with that infant thing is that if they're an infant I'm probably not going to get them to wear the Baha right behind the ear that it should have that on. I tend to stray away from those until they're a little bit bigger.

I don't -- there is a question do we always use the Intenso for single sided deafness? No. We did a lot of those before we had access to the Intenso. So we do have today Divinos on people. I have seen some adults in the past year actually a couple hospital employees that have heard about what we're doing with unilateral hearing loss and come down and asked about it and a couple of them have got implanted and they prefer the Intenso. They'll tell you that a couple of them have told me there is a big difference between listening to the two. The Intenso is much louder and gives them more of a feeling of two ears then the Divino does.
Those are unimplanted. They have chosen the Divino -- the Intenso prior to implantations and but for fun we could go back and put the other ones on and see what they thought.

I'm rolling through. I'm hoping I'm going to get everybody. How are we getting funding for the Softband? Donna, don't kill me for saying this. But I group our kids into two categories. If they are unimplanted in my eyes the Baha is a hearing aid to us. It is a hearing aid to our state medicated system because it is not implanted. They look at things very black and white. That is how we pay for it. We bill it as a hearing aid and just like the hearing aid has to have batteries and in this case it has to have the Softband so we put it altogether. When it does move to implant then of course we call it an implant. We tell them it is not a hearing aid. It is a completely different ball game there. We're lucky enough that they do see things so black and white that they don't really know that there is a gray area in between there. That is typically how we get it. Loners you'll have to talk to your Cochlear rep about that.

Bilateral microtia I would think they would be a good Baha candidate for both ears.

I'm getting a question about why not child proof the environment and put padlocks on the -- I'll pass that on to the school. The speech pathologist is a good friend of mine. I'll make sure she does that this week. That is a great suggestion, Doug.

On the bilateral microtia for which programs are we using on the
Divino. Definitely I tell them to keep it on one on omni. For the biggest part of the day and the older kids I teach them how to flip up and down and change programs for when they might need to during school.

Yes, the FDA does have criteria for Baha in children. It was actually similar to the time -- there we go. In this sense it is similar to adults except for the age indication. Donna, how am I doing on time? Okay? With bilateral conductive hearing loss in normal bone scores a unilateral Baha stimulate both. In theory, yes. Except for the fact that they will not do as well in speech and noise as you would binaural hearing and they don't do as well with localization. So in theory all these years yes it -- in theory it sound right but we're kind of debunking this atta this point because they do better. All of them do better with two. Look for a more real official data on that soon.

I have a question when is Baha not an appropriate choices and I'll tell you one specific kid that I see. He's five. And he has a bilateral conductive loss. He currently wears BTE just on the premise that he also has enlarged vestibular aqueduct syndrome and over the past two years I have seen his bone scores at 4000-hertz kind of drop a little bit. So I haven't gotten him -- he used to wearing the Baha because there is a good chance in the future it won't be an option for him. So that is when it definitely is not an appropriate choice.

Also if there is any sort of skin or bone or kind of weird issues around that then no it would also not be appropriate then. Or appropriate if you have a child who is not going to be able to take care of it. And say we
had a patient with (inaudible) syndrome and we did not implant him because there is a very slim chance that he's ever going to have the ability to care for those. He is not a very good hearing aid wearer and I don't expect he will be a good Baha user and there are certain cases where just developmental level of the patient and any other kind of medical conditions.

Any unilateral cases that were not successful not yet. We like to say that we don't really have any non-users so we're happy about that. Osteo integration for children takes about six months. And let me explain again on the trick on the brain. I just tell them that because it is an easy way for kids to get that. They often understand what a trick is or that they -- what they do so I tell the parents it is a trick. It is going to pick up sound on this side of the head where there is little to no hearing in this ear. It is going to route it to the other ear. Because it is coming in at two different times milliseconds apart the brain perceives it as a second ear. So that is what I tell them. The cut and drive it to the parents. That is how I tell them it is a trick. It doesn't make hearing come back over the year it just makes your brain think that it has.

One more. The fluctuating bone connection thresholds we typically don't implant those kids until we know it is stable at some point. If it is stable mix we would do it and it is stable conductive we would. But if it is fluctuating we like for it to get itself settled before we start to implant it with the Baha. Now, with that being said I definitely let them try a Softband and do some trials with that. But not implanting it at that point.
I think I may have gotten most of them. And when noise -- I don't have any complain about wind noise. I have a couple of girls with some really thick hair that complain about that sometimes. But not -- I haven't had a complaint on the wind being an issue of hearing it better with the Baha or blowing on it and causing any sort of feedback or wind noise.

>> Donna; Lisa, are you finished?

>> Lisa: I think I have gotten through all of the questions, maybe not.

>> Donna; There was one question I noticed about the cost of this surgery and then the device. The device for two processor system is probably a little bit less than 7000 and then with the hospital fee and the cost of the hospital and the cost of the device we're seeing about 12-$15,000 for the surgery, the surgeon's fee and the device itself and that is going to vary somewhat by the hospital. And there were a lot of questions related to insurance. That really depends a lot on the state and the individual. We are seeing people who are persistent about going back to their Insurance Company being successful at getting the Baha covered but it really depends on the insurer and where the person lives.

With that we'll close this down. Lisa, thank you for a really fantastic session. We had people attending from all over the world. And obviously a lot of interest with all the questions. So we hope to see all of you back soon at HOPE Online. This is Donna Sorkin at Cochlear Americas. Bye.

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