

Rough Edited Copy

Cochlear Americas  
CA-CAN Chapter Meeting  
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>>SPEAKER: Okay. Good morning everyone. Will have  
 This is our monthly meeting, Cincinnati Cochlear group.  
 We are thrilled you are all here.  
 We were looking for the light switch and can't find it.  
 We normally start the meeting seeing who is here. I have two cochlear  
 implants -- everyone with at least one cochlear implant raise your hand.  
 Of those, how many have had them a year or more?  
 Raise your hand if you just got your implant a year or less?  
 How many people here considering an implant?  
 How many people here are actually scheduled for surgery?

>>:

>>: Not until the insurance goes through.

>>SPEAKER: Normally we have introductions but since there are so many  
 people we push that to the end of the meeting. Normally we have a couple  
 groups in the back for people considering implants and people just getting  
 implants. For people had them for a while and we pair off with volunteers so  
 everyone has someone to talk to. We will fit that in at the end of the meeting.  
 Today we have a speaker. That has come down from Columbus. I will let  
 Greg introduce here. He is the cochlear volunteer coordinator. He works for  
 cochlear. I will turn it over to Greg now.

Greg: Gail why don't you join me. We have doctor Gail while law here to  
 speak. It is a fascinating presentation. I am looking forward to having you.  
 Thank you.

Just so you know here is the clicker.

>>SPEAKER: Thank you for having me here today. Normally if you are out  
 of town you may be the expert giving advice but you are the experts on this  
 topic. You know more about I do.

I will tell you a little about research that is out there that helps us to look at  
 some issues related to hearing loss and why hearing loss maybe bigger than  
 we think it is. We are learning a lot of things now.

It may help you to encourage other people you know to consider improving their  
 communication and hearing.

It may help you guys to make decisions you are making.

Those thinking about surgeries or planning or considering.

I am here for you today. If you need me to slow down, if you need me to  
 clarify, if you need me to do whatever you need me to do, raise your hand and  
 let me know.

My question to you is what is hearing? Throw out ideas what you think hearing  
 is?

>>: Sound.

>>: Information.

>>: Connection

>>:

>>SPEAKER: Beautiful. Anything else?

>>: Communication.

>>: Perception of sound.

>>SPEAKER: No one said a beep in a booth under headphones.

You see the bigger picture of what hearing is.

Greg: It is very archaic I know. If you want to go back a slide --

>>SPEAKER: Okay, very good I got it now.

This is how I teach audiology. I teach audiology at Ohio State. I practice and I teach audiology students.

This is something we use I want you to know about.

If you know about this you are likely smarter than the audiologist that you work with. They don't all learn this. It is old, from 1992.

It is called Erber's hierarchy.

It starts with this down here called detection.

When you are sitting in the booth and someone asks you to listen to a sound.

All you are doing is detecting it.

The stuff you talked about is much more important. It is the how do you discriminate sound?

If someone is knocking on a door how does that sound different than a door bell.

For some with significant hearing loss it doesn't. Your brain needs to learn that description.

Identification of sound.

What is someone saying. What words are coming out of their mouth? What do their sentences look like?

Comprehension. How you put it together and how you perceive.

This hierarchy is very important. This is what hearing is about.

Unfortunately a lot of my audiology friends get stuck down here.

You know this -- I will show you in the next slide.

This is an audiogram with speech banana in it. It has where speech sounds are at. Many people with hearing loss that end up with a cochlear implant, their hearing is down here so speech isn't really accessible to them without some type of device, hearing aid, implant... whatever.

So what do people say about hearing? If we think of the Erber's Hierarchy, the detection part.

Most people say I know there is a sound but can't make it out.

I can hear well in quiet rooms but if there is background noise I can't hear with that.

Or speech goes by too quickly. I cannot pick it up because by the time I figure it out, someone is onto something else.

In audiology, when I first became an audiologist 34 years ago, you are all supposed to say you don't look that old:

(Laughter)

Audiology looked at frequency when I was in school. Pitch or intensity or loudness. We didn't have a good understanding that the timing component was important too.

Our auditory systems are sensitive to timing.

That is something you hear a lot with hearing loss is the timing is off for me.

So, today, we will explore a little about why this happened. I want you to know recent research and think about why some of these things happen.

You are bigger experts of this than I am. I feel privileged when I get to come to a meeting like this. I talk to a lot of people, I talk to professionals and students. I am get to talk to you guys and you teach me more. Every time I lead a group like this someone changes something and it changes the way I practice audiology. So I appreciate you being here this morning -- I said to Greg this morning, what a beautiful place.

Why does all of this happen. Hearing happens in the brain not the ear.

The ear is the window to the brain. That is an important concept behind this.

The concept of listening is so much greater than a beep and raising my hand or pushing a button.

I have a patient in Columbus I adore. He has a foundation I have been on the board for 20 years.

I asked him how long I got to be on the board and he said until you die or until you say no.

I said those are good concepts. They raise money and we give it to kids who have hearing loss in central Ohio. It is an easy gig, they raise the money and I give it away.

He is a hybrid candidate and he can't hear in a meeting like this. But on the audio gram, he doesn't meet the criteria. Most of you have could tell me I tested your hear and I will tell you about the audio gram and you will say Gail you are wrong. When I am in a restaurant and we are having lunch I can't hear. I can't function in the real world. That is how listening is different than hearing. You are nodding you are heads I don't have to tell you this.

Listening requires attention and requires ability to integrate a lot of information. Signal to noise ratio. How loud everything is in the background compared to the person speaking.

It requires knowledge of language.

My guess is everyone has difficulty when you first are learning a different language. That language could be a foreign language or that language could be you are learning new vocabulary related to something. That multiplies with someone with hearing loss.

That is something to keep in mind.

Cognition in hearing is a hot topic. If you go to a hearing aid manufacture website there will be something about this.

There is a Mayo clinic conference in February that this year this was the topic. It is huge in what is coming out and moving forward. You will hear the most cutting edge things.

Hearing is a perception of sound. You hear beeps and you know they are there and you push a button.

It gives access by detection only. You are aware something is there but you may not be aware of what it is. What you are hearing.

It functions as bottom up. It takes information from your ear to your brain.

The information goes from ear to the brain in an easy manner or if there is more background noise or someone not speaking the language you are familiar with it causes more difficulty.

In hearing the processing of sound is minimal. You know it is there. You don't have to do much with it.

When a person gets a hearing aid or cochlear implant, they hear the sound loudly, more loudly than before but the sound may not have meaning to you.

If you think, most of you currently wear hearing aids or a user. When I do a fit often times they say that is really loud. It is not clear but it is really loud.

I say this is day one, by day 90 we'll be better.

Your brain takes a long time to relearn things. We will talk about that in a second.

Listening and contrast is active process.

Listening requires you to access information and make use of it.

So intention and attention are really important.

What is your intention of listening? I have to tell you now that I have been an audiologist for 34 years. Most people know what that is now and people don't say huh?

People will come in and say I have selective listening. I don't want to listen to my spouse. Males and females say that often. The intention is they don't have interest in listening. Intent or paying attention.

We know most people have intent and want to attend to auditory information because it connects you to the world.

It is a top down process. You have to be able to get the information and make use of it and put it into context.

Cognition is how knowledge and comprehension are gained.

If you want to get at the top of Erber's Hierarchy you have to access cognitive abilities.

I will talk about this Arnieva Study in a little bit.

She talks about this is the way you treat information coming into you.

It includes attention, memory and language.

So those are three things that are important when we talk about cognition.

You must be able to access language and the way you access is through being able to get to your cognition and sensory issues like hearing.

You may have heard the term executive function.

That means how you take all the stuff and put it together.

How is it meaningful to take visual information?

Anyone in here think they are a good lip reader? Couple of you guys are. Lip reading is a natural skill. It is really hard to teach.

You either become good at it or you come struggling with it. Research after research shows you can get a little better at that skill but a lot of people say -- I rely on my ears. I need the information through my ears.

If I have the ear information the eye information helps me.

If you can put those things together it is called executive function.

The question becomes why does hearing matter in all of this?

In the past when I was first becoming an audiologist we were taught hearing

loss for you guys maybe an inconvenience. You wouldn't be able to hear certain things and that was okay because it was inconvenient for you. I didn't really buy into that because I had way too many people tell me it was bigger than that and life changing and they needed more.

When I was a young audiologist cochlear implants were single channel and didn't exist in the real world. I got to work at Indiana university of medicine and I got to learn a lot of things I was grateful for.

But in the beginning we had analog hearing aids that didn't really work. That was all that was out there. They amplified but not we will well.

Current research tells us there is a critical nature of auditory information and how it feeds the brain.

It is not just inconvenient if you can't hear but it could be detrimental to communicate and cognitive aspects. Brain health and quality of life. That is what we will talk about the rest of the time I am here.

Here are some numbers:

24/7 is important. 24 million Americans have hearing loss that is untreated. We will talk about that untreated hearing loss.

The average person waits seven years to do something about their hearing. All of these people out there but many of you have been in the seven-year situation but many may not have been.

They will come in and think they are too young or too sexy or too something to do something about their hearing loss.

Usually what they say -- that is not a criticism. It is a common reaction. People usually tell me, if people didn't mumble they would be able to hear clearly. As if all the sudden the world started mumbling.

I say did your spouse just start mumbling? They are like yeah.

I say to the spouse, husband or wife, why did you start mumbling? They say I don't mumble.

I turn to my students, if you learned allocution skills.

Hearing loss is a weird thing. You guys know this. When you first start to lose your hearing it is gradual.

Many may have had sudden onset, something viral and you ended up with implant or hearing aid that way.

But the average person has gradual start to this.

By the time seven years goes by, you have hearing loss and seven years into it. Your brain has forgotten a lot of stuff. Your brain forgets what birds sound like. Your brain forgets what clothing noise sounds like.

I fitted a woman this week, she was probably the most stubborn person I met. We had a go around. I had students with me. They were shocked and I said she was nothing. But she was stubborn. I told her what the experience would be. Listening to heels on the floor. Her brain has forgotten. She is a piano player. She wants to play for her church, that is a goal.

She is like I can't not listen to this. It is not your ear that forgot what it sounded like it is your brain. The more time that goes on, it is not just your brain forgetting but there are pathways in the brain being starved of information. Your brain changes.

That 24/7 numbers -- that comes from a hearing aid manufacture, they are using this to go out and market. They are saying don't be in that 24/7. We can do better if we have earlier opportunity.

We know it is not just losing out on hearing it is the cognitive benefits.

The brain builds in pathways but the brain is flexible.

If you take information from it it will change and say I don't know that information exist. It doesn't matter to me.

If you feed the brain and give it the right information. We will talk about the word audibility -- how you hear. Natural hear, implant, in a situation.

Audibility is an important aspect.

Nearly plasticity capitalizes on something great. Your brain is flexible and changeable.

If we can stop problems like dementia and retention, changing the brain and giving it what it needs, it is an exciting thing.

Those are concepts I want you to think about.

I want to tell you a little parable. The 90th birthday.

I have a friend, her mom's 90th birthday was coming up and she had severe depression and appeared to have a lot of memory issues. Was really withdrawn. Family all over Ohio and family would come into town and they would want to have dinner and mom didn't want to do that anymore.

The family would come and were excited about seeing her and she would say I want to sit somewhere else.

My friend was concerned about her mom. She said I want someone to see my mom. She started to get tears. When you get to 90 you are blessed. She is healthy but withdrawn and forget full and doesn't understand what people are saying to her. I think I need a dementia specialist.

She said my goal is my mom hears on her birthday all the wonderful things people want to say about her because I have seen too many people in a casket hearing those things. I want my mom to hear how people love her today and not at her funeral.

I said we have to get started. There is an adjustment period.

There is the best audiologist I know. Let's have your mom come in and see what we can do.

She is fit with hearing aids and it is life changing. She all of a sudden realizes, she wasn't depressed, she couldn't hear what people were saying and felt not with the world. She didn't have dementia.

She couldn't hear.

This has a great ending.

She had her 90th birthday party and heard everything everyone wanted to say and people were saying what changed about your mom? And she said she got hearing back and is able to communicate and participate.

I saw my friend after her birthday and her mom just had a cardiology appointment. We were on campus.

She said it is remarkable because her cardiologist said to her, who are you and where is the person that used to come here? You are a different person.

She said that is how important hearing is.

I don't have to tell most of you that story. For the average person out there that doesn't know what it is not like to hear and doesn't know technology is phenomenal.

The message people get that is not in this room -- hearing aids and cochlear implants really don't work. Once you lose your hearing you can't do anything about it...

We have a mission as a group to go out and talk about these things and not just that hearing aids are great or cochlear implants are great. But they are life changing in so many ways. That is a really important message we have to get out there.

A little about listening and review.

We know listening is very complex.

People are like why isn't hearing like getting glasses? I have friends in optical school. They say we have it great. The visual system not nearly as complex as audio. They call me the diva because I think our job is so important.

Look how many people wear glasses.

Most people with glasses -- I would guess, I have trifocals, I told my brain that these were going to work with me.

I said I know they are really hard but I am going to make them work and I need them. They are off and I need them adjusted and I recognize that.

Most people with glasses or contacts or get implants are really pretty happy right out of the box, there is not a lot of brain relearning.

The auditory system is more complex than that. That is something we need to think about that.

Let's talk about current research.

Working memory. Not memory from childhood but what happened yesterday or this morning. What do you have to integrate.

How does that relate to hearing loss?

This research comes out of the Baltimore longitudinal study on aging.

Some of you may have heard of Frank Lim.

We know as people age they tend to get hearing loss.

Here is what he started to find.

He had a team of neuro psychologist. Psychologist that look at brain related -- he postulated, if you have great degree of hearing loss you will have problems with memory and executive function, putting things together.

He said the more hearing loss the more difficulty you have with memory and executive function.

That was his theory.

Here is what they found.

They found it was true. They found that reduction in processing, speed of processing, in working memory and executive functioning was seven years delayed with a mild hearing loss.

I don't look at audio grams, I look at people.

I need to know why you come to my office, what do you want me to do for you.

Most people with 25-dB hearing loss, that is mild -- I have people come in and say can't hear at all and have 25-dB hearing loss. They may have been told by



a physician or audiologist, this is not enough hearing loss to do something about.

Doctor Lin says even a little hearing loss. It adds about seven years to your life. I want to go the other direction. Making sure quality of life is good is what I think is really important.

Here is another thing Lin talked about.

Shrinkage -- what happens with when the brain gets smaller. What happens when our brain gets smaller from age. It matters where it gets smaller at.

Research from Lin's group found that shrinkage is accelerated with hear loss.

If you have hearing loss and it is not treated. That is the important part of it.

Not treated part, the brain tends to get smaller and the untreated hearing loss -- one cubic centimeter of brain tissue per decibel with compared to those with normal hearing acuity.

It is not just the brain getting smaller, it is where. It gets smaller in all of these \$0.50 words that audiologist like to talk about.

But processing sound and complex speech.

I hope if I give you an audio gram and you listen to the beeps here is what I am going to tell you. You will say I listen to speech not beeps all day.

That shrinkage is really important because you don't want to miss out.

One of the other parts of this is structures don't work in isolation, they have to communicate together in pathways and when the pathways are destroyed it becomes a problem.

Frank Lin came out with audiology paper. His goal was to work with people aging and looking at the big picture. He said to audiologist that you need to tell people, it is a use it or lose it philosophy.

Waiting seven years is a bad thing. The more we lose. We want to capitalize on those things and take good care with that.

Here is a broader perspective:

Frank Lin got real interested in this. Now he comes to all the audiology meeting. He is this huge guy but he really wants to talk to you and me about this topic because it is so important to him.

There is impact of untreated or under treated hearing loss. We will talk about under treated hearing loss in a little bit. I want to lay that idea out there.

Here is what he says happen to people with untreated or under treated. 24 million Americans waiting seven years.

People have depression. Hearing loss results in depression. We were just talk being that.

I also work with people who have ringing in their ears. People call it Tinnitus, some of you may have that. That is often much more impact full than even hearing loss in terms of depression. We will talk about Tinnitus in a few minutes.

Incident or all cause dementia. Any type of dimension can be made worse with hearing loss.

There was a study done, it is interesting, it talks about caregivers. If any of you have been in that situation with spouse, parents, children. You know it is stressful.

What happens when the person being given the care has significant hearing loss and adds care giving stress?

We know being able to treat it on both sides. Treating someone with dementia with hearing loss helps that person but may also help the caregivers. That is an important thing in all of this.

Falls: One of the main causes in older adults is getting a fall and ending up in the hospital and doesn't have good outcome.

Some audiologist are involved in fall prevention but we all talk about how it is important. You know some people with hearing loss have issues with balance. That is not what Lin is talking about here. He is talking about -- we will talk about the talking and walking study in a little bit.

He is talking about, someone calls you and you don't know which direction and you get off balance and fall over.

Gait speed. How quickly you are able to walk. It doesn't mean you have to walk fast. It means you don't lose that speed. That is also an indicator of dementia, cognitive decline. There are interesting studies on that.

Social isolation. That is one of the biggest things. The story with my friend's 90-year old mom. Social isolation is also tied to dementia and Alzheimer's.

Lin says it is unfortunate yet inconsequential part of aging.

My husband and I came down last night. He is staying in our hotel. I said I get to go work and he said I would rather do this than sit in hotel watching ESPN.

We stopped at the golden lamb for dinner and we were talking about positioning in people in restaurants. The restaurant was quiet. I said I like to sit in the seat for person with hearing loss. I don't want to miss anything. I like to hear it all.

There was a funny table next to us.

I said to my husband is one of the things that upsets me is when someone is struggling to hear and someone at the table doesn't want to repeat and says never mind it is not that important. If it wasn't that important you wouldn't have said it. Secondly, let's try to talk about how we teach people to communicate better.

How do you be a better communication partner. That is important to the person -- I don't have to tell any of you this. But the person with hearing loss wants to know what is going on. That is why you have all of these bells and whistles and mics and FM systems. You want to hear. We don't want social isolation. We don't want someone to say never mind. How would you feel if you asked and people said never mind. We've been married 30 years and he thinks he is an audiologist and he was counseling someone last week. He does a good job and does what I want him to do. He talks about people in his work place. People will say I had trouble hearing in that meeting and he says my husband is an audiologist and he hears that hearing aids don't work.

He is very excited to hear about what technology can do.

We talked about ringing in the ears.

One of the problems is with this is you pay attention to it but you can't ignore it. If you could you would.

You are often told there is nothing that can be done about it.

The more the brain hears that, it is flexible remember. It builds a feedback loop.

It hears the ringing and pays attention to it. Then the ringing becomes more prominent.

They are told nothing can be done. There are things that can be done. It doesn't work for everyone. It is confusing, there are so many causes.

Some of the causes we can help.

The ear related cause, you may have been told, if you go ahead and think about a cochlear implant you may not have the Tinnitus anymore.

We know the brain is a powerful thing. It remembers a lot of information.

You may have heard about phantom limb pain. Someone gets amputation of arm or leg and it still hurts.

Auditory system works the same way. They would kill the 8th nerve, the nerve of hearing. They would destroy that and people would still have ringing in their ears.

There are things that can be done, it is another thing that adds to depression and dementia and needs to be treated when it can be.

Let's talk from a broader perspective.

>>: I have that ringing in the ears, how do you find someone to help you? My audiologist told me you can't do anything and it is getting worse?

>>SPEAKER: Finding an audiologist that has experience. My e-mail is on here --

>>: Allison young is our specialist at UC.

>>SPEAKER: You need to connect at the end. As audiologist that works with Tinnitus patients -- going to someone that actually works with patients. It is not a criticism of my profession -- it is but it is not. I see people with vestibular issues, I don't do much with balance. When people come to me I don't say that is too bad. I don't really know all you can do about it. I want to refer you to someone that can help you. I am not a cochlear implant specialist but I know which patients need to go to the cochlear implant team. That is frustrating about my profession or ENT's, they are worse. They say you have to learn to live with that. I had someone say to a patient why don't you pull up your big girl pants.

So good we got you connected.

So we need to think about the auditory system and looking at things that are broader. I brought up timing before. Both older and younger listeners benefit from spatial information. Where something is coming from in space.

One thing people lose when they start to lose their hearing. The richness of you are walking and someone comes up behind you, which direction they are coming from.

You are riding a bike or roller blading and someone is coming up behind you.

It is not just a hearing issues, it is a safety issue and it is also a predictability issue. You are not startled and you need to know what is going on. We need to look at spatial aspect too.

Other considerations, listening for speech not beeps.

Non-speech, birds whistling.

One of my favorite patients passed away from an issue in his back. He had cancer. His wife came over, he was at Ohio State.

He regretted not doing something about his hearing earlier. People are coming over now -- his number one greatest thing is sitting outside and being able to discriminate birds whistling.

One of a co-author of a book. He was a man that lost hearing at 14 and had progressive hearing loss.

He was really really smart. He taught me more about writing in high school.

He taught me about writing a book that people actually want to read as opposed to text books. We had a lot of fun over the years. He is a by lateral cochlear implant. He was huge in deaf culture. His favorite thing about having two cochlear implants. Discriminating six types of birds in his backyard. When he first got his implants he was going to train his brain and use birds to do it. He was thrilled with the outcome. I get to listen to people talking about these things.

Selective attention. Relative information. You focus on what you want to hear and ignore what you don't want to hear.

Processing in challenging listening environments.

Let's talk about cognitive abilities and their roles.

We have solid cognitive abilities support for complex listening or learning or knowledge.

We also know we can compensate by drawing on context and non-auditory skills like vision. Like knowing the language that someone is speaking in. Knowing if you walk into a family party there may be the same discussion all the time. Maybe people are going after Trump and Hillary. This side of the family will be Trumping and this side Clintoning. You have context and can predict what is being said.

It also support precision and uncertainty.

When you are certain in a situation it is pretty easy.

Think about going up to the counter at your favorite restaurant. They will ask you the same questions and you have been through that before.

Think about going to a new physician for a condition that someone might be very critical. Being in an emergency room in an emergency. Or going to a new country and going through customs.

My daughter is 20 and student at Ohio State. She is getting to be fluent in Russian. Last summer she had to get her travel papers and they spoke to her in Russian. She said all of her Russian went out of her head. If it wasn't done right she would not be able to go to college in Saint Petersburg. She had to get money and -- it was stressful because there was a lot of uncertainty about what was said. She was never in that situation before. There was a lot of precision that had to happen.

When you have more demands that is when we are more concerned.

Let's talk about cognitive abilities.

Even when you are in familiar territory and you know you will have the Clinton/Trump discussion. Adding background noise, environment. Those

things make it difficult.

This guy, Akeryod, he says there is a significance in hearing loss and background noise. It really impacts the cognitive ability. It puts more load on you.

If you are sitting back and it is easy to listen that is one thing. If you are in a restaurant and they are discussing things important to you, now your cognition will be taxed because of the hearing loss.

This audibility is a huge thing. Audiologists have a certain way of being able to know how much power or gain you should have.

This is a partnership. I always tell my patients we have to have trust with one another. You have to be able to tell me in all honesty what is working and what is not.

Sometimes patients come in and verbally bomb it. I want to know what didn't work for you before.

You have to trust me that when I say we have to push that hearing aid up or adjust the implant, you have to do it with me. Audibility is really important. A lot of people have hearing aids under fit. They like them because your brain flexibility doesn't have to worry about it. You don't have to change. Change is hard. We don't want to exercise them and make them work.

Not hearing at the right level is not as bad as not hearing at all but it is still not a good thing.

One thing we have to look at -- maybe you don't know this but all the technology you use has a prescription in it. It tells us what level we want you did person to be hearing at.

Just as you get an antibiotic and they say take this many times a day. We do the same things as audiologists.

Untreated hearing loss, 24 million people, wait seven years.

Under treated hearing loss is also a problem.

If we don't get you at a place where you can hear clearly it will not give much benefit.

We want to make sure the untreated aspect is also addressed.

One of the things we can do is give you technology. You know that and that is all great, but, how do we retrain the brain with that technology.

I will talk here a minute and a little more in a few minutes about this stuff.

Auditory training.

Treatment should include the following components with auditory training.

How do we take the good stuff you have, the technology, good hearing, language knowledge you have, and train it better. Get the brain to change.

Smith in 2009 and colleagues talked about this aspect.

They said exercises for the auditory system had to adjust difficulty to user performance -- that is called an adaptive procedure.

Many of you have done luminosity or one of those online programs.

If it is too easy you don't want to do it anymore.

If it is too hard -- we work with kids, I had my class work on it this year. You can do it on a iPad, it is for kids with auditory processing disorder.

I thought I would try it out and I am too old. It is too hard for me.

I didn't want to tell the students I was having trouble and I asked the students and they said yeah. I probably could master it but it is too hard for me. I can't hear the you sounds in this auditory training program.

We want to look at the right degree of difficulty.

How you get rewarded for it? Points, badges -- that is a big thing in some games. Do you get animation when you get it right.

It has to look at your whole range of skills.

Some are to get your two ears to work together. I have not talked about that.

Your ears need to work as team.

What about the timing aspect?

These things are important and good to look at. There is auditory training.

We will talk about two programs at the end of this.

We also have to look at this aspect here.

World health organization.

When I was in school we said hearing loss was inconvenience.

Now we need to look at outside the booth. How people with hearing loss function.

If they have disability. Some people don't think they have disability and are offended. Some people with minimal hearing loss feel very disabled and get resources to help with that issue.

The biggest thing is how hearing loss affect's people health.

Physical, mental and social wellbeing.

The world health says it is not just the physical part where we look at the audio gram but how your hearing loss impacts mental and also the social aspect.

There was a study concluded in Iceland and they talked about the fact that people with no sensory impairments, live longer.

They thought one of the reasons for this was the social aspect.

If physically you can see better you are more social. If you can hear better you are more social. If you get around better you are more social.

They found people with untreated hearing loss die earlier.

Another study in Canada that looked at risk factor with hearing loss and automobile accidents. Not fatal accidents.

What they found was when using a driving simulator, people with hearing loss were more distracted in driving and did more poorly.

Untreated hearing loss can be dangerous we know it is the sound issue.

Cognition. When you think about driving. You have to have vision and hands-on the wheel and experience. You are putting a lot of things together and hearing loss can be detrimental from that.

We know hearing loss reduces perception of hazardous noises.

Increase per September you'll difficulties related to hearing loss with cognitive difficulties make driving more difficult.

(Perceptual)

People untreated hearing loss have multiple accidents.

Lin says hearing loss makes worse cognitive functioning.

This is not a typo. This guy's name is Li. Li and his colleagues. He said if you have hearing loss not treated you end up having to have greater

approaches to your attention and your cognition.

There is more demand on you. That is really problematic in the walking and talking study.

What they did is set up crosswalks and asked people to walk across the street and talk to the person next to them.

What they found is people with untreated hearing loss were almost unable to do this task. They couldn't walk and talk at the same time. That sounds like a joke, right? But it is not a punch line to a joke it is a serious condition and something we need to look at.

Let's talk about the role of hearing and wellness.

If you are not looked at this thing called Ida Institute. It is free and has some wonderful wonderful resources. Not just for professionals but for everybody. It has information that you can use to think about what your own journey will look like.

It has information you can take to your audiologist.

They have a great Tinnitus resource on there now.

It is free. You do have to register. So you know who Ida was, one of the main hearing aid companies in the world is a Danish company. In the William DuMont. He was a big investor. His wife was Ida. He named it after her. It is an international think tank. It is a neat thing with a lot of stuff.

There are videos on there.

There are ways two train audiologist and physicians and people with hearing loss. One of their thoughts is -- I saw this when I walked in this morning.

You all are way better experts at most of this stuff an I am.

If someone has a mini mic not working you don't want to talk to me. You want to talk to someone that knows. I have done 1 or 2 in my office from time to time.

One of the things Ids a based on is how we build relationships to people thinking about getting hearing implants with people that have them.

I will direct you to that.

How do we protect the auditory system? We avoid the noise.

A cool study. If anyone wants to look at this, this researcher is huge at northwestern. All kinds of auditory research.

Here is what she found: Producing music changes our auditory system over a lifetime.

Here is the study as it turned out.

She wanted to look at people with hearing loss and people without hearing loss. Young people and older people with hearing loss and people who don't have hearing loss.

How music changes their brain.

Another thing we never knew. Producing music isn't about it necessarily being good. It is about your enjoyment of it. You sing half hour a day or play the banjo half hour a day. What Kraus found is people with normal hearing who produce music half hour a day have different brain structures and listen better in noisy environments.

That is the first good news. People with normal hearing young kids growing

up, we should encourage everyone to produce music whether they are good at it or not. They don't have to sound like Taylor Swift...

They looked at young people and found better pathways.

Interestingly, they looked at older people with hearing loss and found that compared to the typical person with hearing loss, the people that produce music half hour a day had better speech understanding in noise.

That is what we are all aiming for.

This gets into cognitive aspects that are not speech, they are music related.

How exciting is that.

Her research is amazing. If you are into research she is a place to work.

What does it take to address hearing and cognition. You have to have good hardware and have to be fit audibly to you are able to access that information.

What do we do next?

I don't want to over sell the situation because evidence is weak. Another study addressing hearing loss and fitting hearing aids.

Now they say if you get hearing aids you don't get dementia other diseases.

Research now points in the direction that the stuff you guys are doing, going out and using your implants effectively and making sure people know about better hearing and Audibility.

I don't want to say get hearing aids and you won't get dementia.

Here are some things we do know.

The evidence says there is a lot of benefit to hearing.

We know slower cognitive decline is slowed with people with better hearing.

We also know that there is a reduced decline when we look at screen test of people with dementia following the fit and use of hearing aids.

Those of you with implants, you know this. Hearing aids you put on all day and take off at night. It doesn't mean you wear them for an hour and that is a good thing.

You need that input constantly. The window to the brain. We need that.

This study I mentioned before, Arnieva, her colleagues out of France.

It was a big study, 4,000 people 65 or older. For 25 years. She was like doctor Lin. She is not interested in audiology, she is not interested in us folks. She found, if you had improved communication provided by hearing aids -- in this case. Better hearing.

It improved people moods, it improved social interaction and cognitive stimulating activities and reduced cognitive decline.

25 years of research showing this.

When I come and talk about manufacturers, none of them are paying me to be here. I am promoting finding a great audiologist to help you.

I happen to work with some of the manufacturers we talk about and I will say that. But I am not representing anyone here today other than trying to give you some new information.

What does the evidence say about the benefits.

Arlinger says hearing aid use reduces problem behavior.

When there is not the fight it improves relationships.

Older adults with hearing aids have better emotional and social wellbeing and



greater longevity.

It is nice to be able to see some of that.

Here is what we know about the new wave of information.

We know people with hearing loss are social creatures

Being isolated contributes to early death.

We know hearing aid use prevents socialization in people with hearing loss.

I am talking about anyone. We don't want people to be socially isolated. We don't want people to feel like they cannot be part of communication because there are things we can do to help that.

Singh in 2015 found significant correlation between social support and hearing aid satisfaction. That should be important to everyone here.

Evidence is the huge thing at the moment. The huge go to.

Why was the last statement I made important?

The reason is the greatest predictor of hearing aid stats facts is social support.

I am amazed when people come in and they have gotten to their breaking point.

That is often how you work with someone when they are your spouse or child or friend -- . I had a woman come in with her friend this week. She was the most amazing social support. I was so impressed with her.

She said let me watch how you change the batteries with that. If she has a problem she can call me.

>>: I am going to ask a question. A friend of mine takes them off and throw them in the garbage because she got tired. Someone talking to her and say huh, huh.

>>SPEAKER: She is not the only one.

He said he has a friend who got tired of wearing hearing aids and took them off and through them in the garbage. It is kind of like my glasses right now. I know they are off and can be better and I need to go see someone.

Sometimes -- hopefully you leave here today knowing open communication is important.

If you are not happy with something with your hearing aid or implant. As an audiologist I want to know that.

I want to know when they are not working. That way we can think about it together.

How many use an accessory with your implant? Mini mic or whatever? A good number of you do.

When you think about that, I will probably put words in your mouth because I want to wrap up -- you did that to improve your communication. Your implant was great but in noisy environments it didn't do everything. There was nothing wrong with the implant, the auditory system has the problem. Until we figure it out we can't have any device that replaces the original equipment.

You might put something extra on there and it maybe something simple that someone could have changed for her. That makes me sad. Hearing aids are expensive. Generally not covered by insurance.

I think that is one of those things that always taking a look at is an important aspect.

Thinking about comments or perceptions. I mention that sometimes family

members come in and are not very supported.

What significant others can do is encourage others to seek help. Advocate for hearing aid wear. Assist with maintenance. Facilitate communication or increase adherence to recommendations.

I know how many hours a day you wear your hearing aids and I can plug them in and figure that out.

I love the people that come in and say these don't work. I say why don't they work? I don't know, you tell me, you are the expert. You are really the expert on your own ears I just sort of facilitate. They say they wear them all day. I go in and check and it says an hour and a half each day. I say you must sleep a lot.

Someone to encourage you to put it on in the morning. Water in the sink, the dishwasher, the stove, the refrigerator. Things your brain needs to realign to. Learn more.

One thing we know is in adults 50 or older, if they have positive self-perceptions, they live 7.5 years longer than people with poor self-perceptions.

People develop negative self-perceptions based on health issues. That wellness theory again is coming back to us.

Including things like hearing loss.

We know when we increase the effectiveness of hearing aid use in people over 50 it helps with happiness and longevity.

Audiologists are going back to our roots. It came out after World War II.

Hearing was destroyed in the war. We are a relatively new profession. One of the things we were really good at in the olden days is people would come in and say I can't hear in these environments and we would work on things because technology wasn't there. We lost our roots because technology is so far. We are finally getting back to this stuff.

One thing I didn't talk about -- if you want to work on better brain coverage with your technology, you have to do it every day. It is like having a personal trainer. Or physical therapist. You want to exercise something and make it stronger or lose weight or whatever your goal is. You have to do it every day. That is what all the research is starting to tell us.

I will tell you about two programs you can try.

Let me just skip ahead here.

I want to say how cochlear implants changed the world for me.

I have a lot of interest in -- one thing I thought was interesting is we didn't know much about how the auditory system worked. Cochlear implants came along and taught us a lot of stuff.

Thanks to all of you guys doing what you are doing. It also helps people with more mild hearing loss because we understand better and we can aid them and rehab them differently.

Just putting implant on you doesn't change much. You have to work it and exercise the brain and look at all of that stuff.

That is what really came out with implants.

I think if we were more careful about hearing aids and did a better job we may

be taken more seriously and get more attention from insurance. That is another discussion.

If you go to an audiologist and you don't have good communication with them, there are a lot of them out there, you can change it up.

Going to a store like Costco, you are not going to get what you need T you may get -- 24 million -- there is plenty of business out there.

When you talk about training the brain -- that is not at Costco. You don't want to go there for that.

If you want to hear an amazing presenter on cochlear implant, Sharma has done so many on that. She is phenomenal.

To change the auditory system it has to be varied and challenging and developmentally appropriate.

There is a fun guy from university of California. He said the reason men didn't want to do auditory training is there were too many girly topics. He is a sports guy. He developed Lace. He wanted to make sure there were things gender interesting. Developmentally you have to want to do this.

Here is something about LACE. It is available to use at home. It trains you in background noise. It has to be done in a short period of time. They give you 40 days. They want you to do it daily. If you don't do it in 40 days they don't yell at you they just don't let you come back in until you pay for it again.

LACE is a great component for listening and background noise. It has great research. You can do it at home or audiology office. It has all of those things that are really important. We have used it with kids, teens, adults.

>>: The website. Can the lady put in a in.

Www.neurotone.com.

Here is another one called read my Quips.

This is another way to kind of retrain the brain and looking at that.

The benefits of brain training are documented and research.

Cochlear implants and training stimulates developmental plasticity.

Development of the brain. The brain stem -- even years after the hearing loss. A lot of people are, it is too late for me. It is never too late. It is better to not wait the seven years but it is not too late.

The longer the time the more limited the change.

We know we want to identify hearing loss as early as possible and intervene as early as possible.

That is the big thing you should leave here today with.

>>: How long does it take or does he need help with this implant. He is having surgery on the 18th --

>>SPEAKER: That is exciting.

>>: Will he need a lot of help with this or work the device on his own.

>>SPEAKER: I would leave that for you to discuss with the folks that have experience with this in this room. I see a whole gamete of things. But individual differences in the auditory system.

When you look at two people with the same hearing loss on paper, the way they respond is different. Part of that is what caused it -- but you have a room full of experts so I will defer to them.

Greg: We will break out after the presentation.

>>SPEAKER: There are a number of people that can talk about experiences.

The guy with the six birds, he took about one rehab session and told the audiology how to do rehab. He studied this his whole life. I said to Laurel, I met someone in Columbus that has really struggled. You wouldn't think that. He really had a lot of difficulties that were unusual. There is the whole gamete of people and I hope the people have the easier road. There are a lot of opportunities for people. Some of them are in this room right now.

Gordon says identify early and get help as soon as possible.

We know hearing loss impacts cognitive load.

This better hearing institute says getting a hearing test maybe good for the memory.

That is a great way to think about it.

Some people think I am really struggles, it is because I am getting older. It may not be that, it may be related to hearing loss which is easy to address.

My summary for this morning. You have been sitting a long time.

We need to address untreated hearing loss.

We need to make sure the brain hard wire is in place. Implant or hear aids that you have what you need to get the information in.

We need to think about the science behind the cochlear implant and know it is not just the device but the optimal information to the brain so we are not stuck saying dementia is going to be my future or when I am driving I don't feel confident.

All of those things we can address are great quality of life indicators. So we want to address those things.

I appreciate your time. Thank you for being here. I know you will have break out sessions.

>>: I have a question -- you talked about hearing loss. My husband has disease -- hopefully insurance covers. The other day when the sun was out -- I think it has a lot to do with the weather outside. He can't hear at all today. Since the first of the year he had 3 or 4 infections and I have to text him on the phone and let him read it.

You talked about the social aspects -- I have a neurological disease myself so both of us have a lot of stress.

Because he could hear in this ear he prolonged getting the cochlear implant for about ten years. I am wondering how much that will affect --

>>SPEAKER: The person I spoke about has Meniere's Disease. It is very complicated. We think it is probably autoimmune but there are a lot of options. Once the implant is done you might want to look at what is going on in the other ear and maybe look at bi modal fitting. In my mind, when you look at a medical issue like that it should be easier for a physician to write about.

Not that anyone shouldn't get the implant but certainly someone with Meniere's Disease --

>>: I am happy to talk about that.

>>: We can break out.

I want to thank you very much for your time and energy.

>>SPEAKER: You are very welcome.

>>: Normally we have a wide group of people with a wide group of questions. At this point I would like to show you who we have to answer the questions. We have Laurel Olsen in the back. We have Theresa in the back and Kim, they are all three audiologist. We have Greg White from cochlear and Sister June. Jane, Becky. We have all kinds of people. Those people to go to the back. If you have specific questions about remote, mapping, activation, we have people that can answer those questions and we have Gail that can answer questions also. Feel free to go to whatever area you want and we will do our best to answer the questions that you have.

Thank you Gail.

>>SPEAKER: Thank you.