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## **2013 TypeWell Conference Deafness, Hearing Loss, and Communication Access Kim Thiessen**

Professor: Are there any coordinators in here? This will be basic, so feel free to slip out if you're bored. Just saying.

I've had a lot of transcribers ask me personally, or I've seen the question come up on the listserv: why am I transcribing for this person? They don't even use it? That's what this presentation will hopefully answer.

My name is Kim Thiessen and I'm the coordinator at Western Washington University. Feel free to ask questions as we go.

Before we can talk about these things, we have to know how people hear. Then we can figure out why people don't hear, then we will go to communication access.

### **Hearing System**

There are 4 components:

1. Outer ear
2. Middle ear
3. Inner ear
4. Central auditory pathways.

The outer ear is made of the pinna. It collects the sound waves and funnels it down the ear canal. The ear canal is curved and about 1" long. It has hairs and glands producing cerumen, a wax to keep the ear moist.

The middle ear has the eardrum and the hammer, anvil, and stirrup. The vibrations of the tympanic membrane are transmitted down these parts. The hammer and anvil are the smallest bones in the human body. Many people don't know where those are. If you ask around, people have heard those are the smallest but don't know where they are.

The stapes transmits the vibrations to the inner ear. There are 2 divisions in the inner ear.

The hearing division has the cochlea and the hearing nerve. The cochlea is the bony structure in your ear with the sensory organs for hearing. From there it releases chemical messages through the vibrations in the stapes and it activates the hairs, continuing on to the hearing nerve that carries sound vibrations to your brain.

The **central auditory pathways** are responsible for localization of sound, understanding speech, and figuring out what's said in a noisy environment. It processes complex sounds, including music at a party, and that kind of thing.

This is an **audiogram**. The parts through there, where the letters are, are the speech sounds, called the "banana belt." A person with "normal" hearing would be able to hear all of this. [On overhead.] With the people we work with, maybe they can't hear many of those high pitched sounds, or maybe they can only hear to this line, so they can't hear the sounds over there. We'll talk about those more in depth later.

Do you have any idea approximately how many people have hearing loss in the U.S.?

Student: 80%.

Professor: 80?

Student: We all have some kind of hearing loss.

Professor: It's 10%, so 31.5 million people. That's a lot. Many times people will think that old people have hearing losses. That's what people not in our profession think. About 1 in 3 people over 60 do have hearing loss, so that's true. But the majority of people with hearing loss, 65%, are younger than age 60. That's a lot.

1 in 6 baby boomers have some kind of a hearing loss.

There are more than 6 million people between age 18 and 44 with hearing loss.

You can see it's not just an "old person" thing. Almost 1.5 million children have documented hearing losses.

3 in 1,000 infants are born with a serious to profound hearing loss, so they are born deaf. That is a lot of babies. In the past, and even now in some places, they didn't detect those hearing losses in babies. So they go to school in kindergarten and that's when they find hearing loss, when they test for hearing. Now they do a test in the hospital, in early intervention, before the mother leaves the hospital.

The largest group that's gaining hearing loss is the teenage to 20-something group, because of headphones and listening to music that makes their cars rock, etc.

Some of the consequences of hearing loss are as follows. As we said it's not just for people who are old. It can happen anytime. You could wake up one day and be deaf.

With children, it causes difficulty in learning. When they get to school, they have missed out on so much language and communication learning that their self-esteem is low; they don't know what's wrong with them or why they're different. Being successful in school is sometimes

difficult; they get teased and bullied a lot. That's a huge consequence of hearing loss.

If a kid has a hearing aid, the other kids will laugh at him. It used to be "four eyes," but now kids do the same thing with hearing aids. It's a piece of equipment that's not part of your body. And we all know how much bullying has increased.

I'll talk about different kinds of hearing loss. One is **conductive loss**. It can be the result of blockage in the external canal, or as a result of disorders affecting the middle ear and the ability to transmit sound to the brain. Many times that may make a difference to the loudness of what a person is hearing, so it's clear but not as loud. It's like plugging your ears.

Many times there are middle ear infections, especially in children, causing conductive hearing loss. This is when parents put tubes in kids' ears to get fluid out so hearing is clear.

Student: Is that generally temporary?

Professor: Most of the time, but not always. It depends on so many different things once you get into the ear. If they get the fluid out, it's generally temporary. But if it happens once, the odds of it happening again are high.

**Sensory Neural Hearing Loss.** This is when something in the inner ear or auditory nerve isn't working. It could be damaged by all sorts of things: maybe there are not enough cilia (hair cells), maybe there's a metabolic problem, etc. There are many reasons why it could happen. Many times you don't know why it's happening. Sometimes doctors can't even figure it out. You just can't hear all of a sudden.

This will often reduce the clarity and intensity of sound. Even if the sound is loud, it won't be clear: it will be more like white noise. Typically it doesn't respond to medical treatment. In other cases, hearing aids may work because they increase the sound volume. But for sensory neural hearing loss, most of the time there is no treatment. It's almost always irreversible and permanent.

**Mixed Hearing Loss.** This is both of those two combined: the sensory neural and the conductive components. This is when people have ear infections that won't go away. With conductive, they may have occasional infections; this one is constant because it affects the rest of the ear and the ear canal.

Sometimes in this kind of hearing loss, the middle ear causes the hearing to become worse than if you left it alone.

Student: Sensorial neural is middle ear, right? And the conductive is the outer ear?

Professor: The fluid in the ear is usually in the outer ear, yes.

**Unilateral Hearing Loss.** Anyone know what that is?

Student: Across the board?

Student: Complete deafness?

Professor: Good guesses. One ear hears normally and the other is deaf. We've seen an increase in this at our school. Almost half the students we work with, so 7 out of 14, have unilateral hearing loss. Often the student doesn't know she has this. So it can affect a student's ability to learn, communicate, and get information because she's only getting it from one side of her head.

3 in 1,000 students have a permanent unilateral loss. This is usually not identified when kids are young because they can hear, as long as their heads are turned that way. People don't think anything of it because the child can hear, so it's not identified as hearing loss. It's one of those, "they are just ignoring me; they can hear fine." Many parents cause this "selective listening."

For this, the student is at a high risk of educational difficulty because he doesn't realize he is missing a lot of information. That's a big thing I hear from students: they don't realize they can't hear everything when they think they are getting everything.

When students are aware something is wrong, they don't want to get help because they think it will be OK. I work at the postsecondary level, so I'm talking about young adult people, and they may figure out there is something wrong, but they don't want to acknowledge there is a problem.

They may not want others to think they are different.

They may be embarrassed because they think it's a weakness. Everyone else seems to be doing fine; why am I not? They don't realize the repercussions of hearing loss. If they can just get by, everything will be good.

Student: How do people figure out they have unilateral hearing loss?

Professor: It depends on their ages. At a young adult age, they will probably figure out they are hearing all the students on this side but not this side. So they will place themselves in a seating situation where most of the class is on one side. When they acknowledge there is an issue, that's where they will go to a doctor or audiologist and say, "fix it."

Student: Do they do hearing tests in school?

Professor: In grade schools, but not high schools.

Student: I knew someone at my grade school with a hearing issue but he didn't want his parents to know about it. So he memorized the pattern of the hearing tests by watching others, and just clicked them.

Professor: That's sad he didn't have a relationship with his parents to talk about it.

Student: A couple years ago I worked with kids in elementary schools, and there are a lot of things about those tests that they can trick you about. It's not as efficient as you think.

Professor: It's not. But sometimes it can pick up an issue needing more testing.

Student: In 5th grade, I was concerned about not being able to see so I memorized the chart. It wasn't until I tried on a friend's pair of glasses in 7th grade that I realized I needed glasses.

Professor: Yeah, we don't want to admit something is wrong with us. Many times students come for help after they start flunking classes, when they are in danger of getting kicked out of school and that kind of thing.

**Effects of Hearing Loss.** Research has shown there is a lot of negative social and psychological and health and cognitive effects of hearing loss. There are many things going beyond, "I can't hear."

The person may be angry and negative all the time and doesn't know why. He may be tired or stressed or depressed. He's trying so hard to figure out what's going on and that takes energy. She might try to avoid social situations because she knows she can't be part of the group. It's hard to go to a party or bar and not be able to communicate with people. It's tough. You're isolated socially.

If you're having a hard time hearing and saying, "what?" people will start to avoid you because they don't want to hear that. They want to have an interaction and not repeat things. That causes loneliness.

Reduced alertness and increased risk to personal safety: that's especially important for children- not hearing cars for example when they run into the road for a ball. For adults, driving is a risk. You may focus on visual things and you can't hear cars honking. If someone breaks into your house or there's a fire alarm, for safety, that could be a problem.

You may have difficulty with your memory and the ability to learn new tasks.

Student: How?

Professor: You're not taking it in to get it into your working and long term memory. You may be hearing bits of things and not grasping it to get it into memory.

Job performance: there is still a lot of job discrimination. When a deaf person goes into an interview, he asks for an interpreter. The employer says "we're not hiring him." Legally they can't do that but we know it happens. If someone is working and someone calls to them from across the room, it could affect their job performance and they won't get the advances they should.

And the psychological part is the most damaging when it comes to self-esteem. Many people with hearing losses don't know who they are. There are many students I've seen who are just "there." They don't have a sense of identity at all. They are not part of the hearing world and can't communicate freely. They are also not part of the Deaf world because they don't sign. That's probably the worst place to be.

We talked about about the unilateral. They can hear but in some situations it's difficult. They have a hard time understanding something from across the room or a quiet voice. They have a hard time figuring out where sounds come from, since they only hear in one side. In noisy areas it's almost impossible. Even if someone has perfect hearing in one ear, if there is background noise they can't hear a thing. And being seating next to a sound source, like a computer or projector, will interfere with the understanding of what's said. They also have a hard time understanding quiet speech, especially in groups.

Can anyone think of a type of hearing loss I haven't covered?

Student: Acquired?

Professor: **Tinnitus**. Some people say tin-EYE-tus. Others say TIN-itus. This is where there are constant or intermittent sounds; they are coming from inside your ear. It could be in one or both ears, or in the head and not in the ears at all. Have any of you experienced this? When?

Student: After a concert.

Professor: Yes. Every time you experience this you're losing hearing. Common sounds people experience are ringing, buzzing, chirping, etc. There are all sorts of different things. Later on we'll listen to what people experience after the break.

The most common cause is noise. So construction, music, all of those things contribute. It usually originates in the middle ear behind the ear drum or in the sensory neural auditory system. All those sounds are usually unique to each individual. Many people hear varying things; usually no two people hear the same thing. It's one of the most annoying causes of hearing loss because it's constant. If you have a hearing aid, you can turn it off. Not with tinnitus.

This affects how people think, their emotions, and their hearing. Some people get extremely bothered by it; they get angry and annoyed. Some people get full on depression. I've heard this is a large reason for suicides. That's sad. They think about the tinnitus and focus on it all the time because they can't get rid of it. It's hard to focus on anything else.

It also competes with speech and sounds and conversation and everything. It's like a block between the sound and yourself. People with tinnitus have a hard time sleeping. It will often wake people up and they can't get back to sleep; it interferes with sleep patterns.

It affects concentration, so focusing on school or homework or mowing the lawn is difficult. It interferes with everything.

Student: Is there a way to resolve it?

Professor: There is nothing you can do. You have to learn to live with it, which is why some people get suicidal.

We'll talk about a couple things that might help hearing loss.

**Hearing Aids.** It's an electroacoustic device that usually fits in or behind the ear. For young kids there are some that go in the ear and they have a cord with a box pinned to their backs, so they can't get at it. It amplifies the sound waves. One hearing aid can cost up to \$6,000, and many insurance companies don't cover it.

Think about kids getting hearing aids: what do kids do? They lose things. Many kids don't like their hearing aids. I've heard of kids burying them, flushing them, hiding them, etc. because they don't want to wear them. The parents are thinking, "\$6,000!" They are expensive equipment.

Hearing aids are made up of a microphone where the sound is converted from acoustic to electric signals. It goes through an amplifier that increases the strength of the signal. From there it's changed back to an acoustic signal by the receiver (it's like a mini loudspeaker). From the receiver the signal goes through an ear canal, either through a tube or ear mould. And the battery is last.

**Assistive Listening Devices.** ALDs are things like FM systems, infrared systems, etc. There is a microphone, receiver, and it's broadcast over FM.

The student will have a machine. It may be hard wired, and the professor has a microphone and the student is getting that sound directly into the hearing aid. If it's not hard wired, then you need wires and cords. They are hard wired more and more in educational settings. Many students using TypeWell now used to use FM systems. They are saying TypeWell is better.

Student: If the professor brushed the microphone with their shirt, that would be startling.

Professor: Not only that, if they forget to turn it off and go into the bathroom. . . There are many things kids have experienced.

Student: Does a person have to have a minimum amount of hearing to use a hearing aid?

Professor: They have to have the right kind of hearing loss to use a hearing aid; a hearing aid just makes the sound louder.

**Cochlear implants** are a surgical devices providing a sense of sound. I didn't say "sound;" I said a "sense of sound." The quality is different from what you and I hear. They vary in effectiveness for different people. For some, they work well; for others, they don't work at all. It's a controversial way to "fix" someone's hearing. When babies are first diagnosed, the first thing discussed are hearing aids and cochlear implants.

When you have the implants, all residual hearing is destroyed. So whether it works or not, you may end up with nothing, or it may be better than before.

Student: Both ears?

Professor: Whichever ear it's implanted in. There is controversy in the Deaf community saying this is intrusive. They say it shouldn't be done on children, that the person should be an adult and make their own decision. Parents and doctors say there is a small window for language acquisition and that's when it must be done.

I see many people angry with their parents for getting that implant when they were little; I see other students who love it. There is a risk of facial nerves being destroyed, so not only do you lose hearing but you lose nerves in your face.

Student: Does that include speech nerves?

Professor: Yes. There are many risks. When parents are looking at a child who isn't "perfect," they just want to fix it.

Student: All surgery has risks but one thing that's overlooked with that surgery is that the risk factors are obvious. If something goes wrong, it will be noticed.

Professor: Right. You're also working with tiny bones.

It costs \$60,000 to \$125,000.

Student: Covered by most insurance?

Professor: No.

For the implants, sound is received by the microphone. It separates into different frequencies. A processor sends the sound to a transmitter and that sends the sound to a receiver. The receiver translates that sound information into electric currents, sending it through the cochlea to the brain.

**Speechreading.** This uses visual cues from a person's face to figure out what they are saying. 35% to 40% of what people are saying is visible. That means sounds, not words. Who can tell me what I'm saying? [Mouths words.] Matt, bat, pat. They all look the same.

Other sounds made in the back of your mouth like G and K, you can't see. And many things obstruct the face, like facial hair. They also miss what's said when professors and teachers write on the board.

Let's take a break.

[Break.]

Kim: Let's get back together.

There are many terms for hearing disabilities: hearing impaired, hard-of-hearing, late defined, culturally Deaf, and orally deaf.

Hearing impaired is a generic term that refers to all people with hearing loss. The term "hearing impaired" is used in phone books and on television because it encompasses all people with hearing loss. However, those who are actually culturally Deaf dislike the term "impaired" because it implies something is broken. In the Deaf community, hearing loss is not viewed as a loss, because they never had it!

Hard-of-hearing is a more commonly used term than hearing impaired. 90% of those who have a hearing disability are hard-of-hearing. We often transcribe for people who are hard-of-hearing, though some people are Deaf. A hard-of-hearing person considered themselves to be part of the hearing community. They often don't want to admit their hearing loss. As a result, they often try to hide their disability and do nothing to treat it.

Those who are hard-of-hearing often have some sort of audiological hearing loss. Many people who are hard-of-hearing can benefit from hearing aids and assisted listening devices. They usually use spoken and written English, and don't usually know sign language. Those who are hard-of-hearing often function just fine in the hearing world. Often, those who are hard-of-hearing don't exhibit signs of hearing loss.

Late deafened is another term for those who have a hearing disability. Those who are late deafened have a severe to profound audiological hearing loss. Late deafened usually happens after language acquisition. They may get minimal assistance from an assisted listening device. Those who are late deafened may use written English or speechreading, though not very effectively. Some may use a form of sign language based on the English grammar structure.

Those who are late deafened usually function fine in the hearing world because they know the language and can get used to speechreading. Those who are late deafened usually visit audiologists to get hearing aids. Often, since they have experienced hearing before, they want to fix the issue.

Those with oral deafness have similar characteristics to those who are late deafened. Those who are orally deaf are usually born deaf or become deaf at an early age, prior to language acquisition. Those who are orally deaf usually use hearing aids at a young age, though with limited success. Parents often want to "fix" their child, so they will follow through with any means necessary. Those who are orally deaf are encouraged to use oral or aural communication. These children often spend many hours a week (or every day) with a speech and language pathologist. These children often miss out on school content or the social aspect of school (recess).

Male: What is aural?

Kim: Hearing.

Female: I am studying speech and language pathology and they push hearing tests and audiologist referrals. That's what they do in Nebraska anyway.

Kim: I've seen schools that don't do that and it is very frustrating.

Those who are culturally Deaf have a severe to profound audiological hearing loss. They typically use American sign language (ASL) in this country, or a sign language native to their home country. They typically do not use written English. They often use interpreters as ASL is the primary language. In contrast, those who are hard-of-hearing use English as their first language. Since ASL is the primary language for those who are culturally Deaf they must learn English as a secondary language.

Those who are culturally Deaf often live and operate in the Deaf culture, as opposed to the hearing culture. Those who are culturally Deaf do not believe deafness is a disability. They never had hearing, so they lost nothing. In fact, many who are culturally Deaf would not do anything to "gain" hearing. For many people who are culturally Deaf, losing deafness is just as frightening as losing hearing to a hearing person.

If a person is born with the ability to hear and they lose their hearing, they are considered deaf. However, if the identity of the individual becomes connected to the language and their experiences with being deaf they are considered Deaf. A capital "D" on deaf refers to culturally Deaf. A small "d" on deaf is referring to the audiological condition.

Those in Deaf culture typically use ASL and have a very positive attitude about deafness. Deaf culture is extremely diverse. Those in the Deaf culture learn their culture in residential schools.

Those in the hearing community learn culture from their parents. Those who are part of the Deaf culture typically don't have Deaf parents to introduce them to the culture. The Deaf culture is a very close and supportive group of people. Groups of Deaf people are also somewhat exclusive and tend to stick together.

90% of Deaf children are born to hearing families (preventing the culture from being passed down). Many Deaf kids go to Deaf schools during the week, living in dorms, and return home on the weekends. They only learn their culture while at school.

Female: Why are 90% of deaf kids born to a hearing family?

Male: Often, deafness is the result of genetic mutations or an illness at a young age.

Kim: Genetics is the least likely cause of deafness. Typically, deafness is related to a difficult birth in which oxygen was cut-off.

Male: Genetic deafness is extremely rare.

Kim: I know a family with no history of deafness who has two deaf kids and one hearing kid. There may be some recessive gene that skips generations.

Culture refers to the group of people who share a language, values, beliefs, behaviors. The Deaf community share these qualities, so they're a culture too. They have their own history, traditions, stories passed down through the ages, and behaviors different from the hearing community.

Most individuals with a hearing loss aren't part of the community. Recall that 90% of individuals with hearing loss identify as hard-of-hearing.

American Sign Language (ASL) is its own language. It has its own vocabulary and grammar. It's not just "confused English." ASL can express any complex thoughts or ideas like any other language.

When individuals studied ASL to determine if it was an actual language, they thought it consisted solely of signs for concrete aspects of language. However, abstract discussions can easily take place using ASL.

ASL uses signs, non-manual markers (facial expressions), and body language.

We'll practice a few signs. You likely won't get a chance to practice these signs with Deaf individuals, as they prefer interpreters. However, you may get the chance to practice, as some Deaf individuals use TypeWell.

The first sign we'll learn is "help." If you see this sign coming from the student, it means there's likely a problem with the machine! [Demonstrating.]

"Please" is another good sign to know. [Demonstrating.]

Another good sign to know is, "My machine disconnected." [Demonstrating.]

Next is "thank you." [Demonstrating.]

Also, you can say "TypeWell." It's just the T and the W in the ASL alphabet. [Demonstrating.]

When TypeWell first started at our university, one Deaf student signed English signs. He used the signs for "type" and "good" to say the proper noun! That doesn't work.

Speaking of, "work" is the next sign. [Demonstrating.]

Next, we can sign "student." [Demonstrating.] It's a combination of the sign for "study" and the marker for "person."

"Instructor" works similarly. You combine the sign for "teach" and the indicator for "person." [Demonstrating.]

"Girl" and "boy" are good signs to know. The sign for "girl" comes from the old bonnets that women used to wear. The sign for "boy" comes for the baseball caps commonly worn. [Demonstrating.]

There are also some helpful phrases you can learn. We can say "good morning/afternoon/evening" using the same principles. We start with the sign for "good" and we use a marker for the sun to demonstrate how much time has passed. [Demonstrating.]

"How are you" is another good sign to know. We combine the sign for "how" with the pointer for "you." [Demonstrating.]

"What's up?" is a common colloquial phrase. It works for the Deaf too! [Demonstrating.]

"He/she's cute" is a sign that likely won't come up in class, but who knows!? [Demonstrating.]

You can also sign, "See you later." [Demonstrating.] Or, a variation is "See you tomorrow." [Demonstrating.] You combine the sign for "see" with "later" or "tomorrow."

"Finish" is a common sign in ASL because it marks a tense, but it's also good for homework. [Demonstrating.]

My favorite sign is "Not my responsibility." [Joke/joking.] [Demonstrating.] Everyone likes that sign!

As I said, you likely won't work with Deaf individuals, but it's nice to have a bit of a background. Interpreters usually serve Deaf individuals, while TypeWell usually serves students who are hard-of-hearing. Those students are often very surprised when they finally receive services and see how much information they actually miss! Many of them never realized the quantity.

This is the case for those students whom you serve who don't seem to look at the screen. They watch the professor and speechread as needed, and, when they don't understand something, glance at the screen to get what they missed. It often looks like they're not using the service, but they definitely do.

Next, we'll offer some simulations for you to hear what it may sound like for some of the clients

you may serve. I'll start by playing a clip showing what a person with normal hearing hears, then play sounds for a person with a moderate hearing loss (not profound). Most individuals with a moderate loss feel they can hear just fine.

[Audio clip demonstrations. ***In all examples***, the first clip is perfectly clear, but the second clip is much more subdued and difficult to understand.]

The next example is a dialogue between two speakers.

The next example is a weather announcement. This hearing loss example is much clearer than previous ones. The person speaking is a professional who knows how to enunciate well. However, this man has a very low voice, which carries much better. That likely helps us hear him.

The next example comes from a loud restaurant. Even a person with normal hearing would have difficulty listening in that environment. Imagine how it is for someone who is deaf or hard-of-hearing.

Let's listen to some nature sounds, like birds singing.

Or, how about we listen to some frog sounds?

Let's listen to what a party sounds like.

Here's traffic.

This example is children singing.

Here's a regular song.

Let's end our class with an example from Strauss! [Theme from *2001, A Space Odyssey*.]

This gives you an idea of what the clients you serve actually hear.

I have one last simulation we'll do, demonstrating what a person with tinnitus may hear.

[Audio clip: Demonstration of tinnitus. The first example sounds like white noise with a high whine from a television. Another example sounds like a heartbeat. The third example sounds like laser beams being shot out of a helicopter. The 4th example sounds like a broken helicopter. The 5th example sounds like a train going over a trestle, with machine guns being fired at it. The 6th example sounds like house music. The 7th example sounds like a freight train passing by buildings. The 8th example is a blender on high. The 9th example is a jackhammer with whiny sounds overlaying it. The 10th example is traffic with static over it, and an alarm clock beeping. The 11th example is someone raking gravel. The 12th example is someone beating a wet sack against a wall. The 13th example sounds like a giant marching through a field.]

That was only 3 minutes of tinnitus. It gets very annoying after about 10 seconds! Imagine having to suffer with those sounds all the time.

Thanks for coming. I hope the presentation wasn't too boring. [Applause.]

[End of class.]