Dr. Beattie- Hearing and Visual Impairments – Transcript

Lets go ahead and we are going to start talking about hearing impairments. This is our first shot or whatever at a specific category if disability. Up to know we have been talking about general terms as to what special ed is and parents of kids with disabilities so on and so forth. From now on we will go basically week by week looking at individual categories of students with whatever the disability happens to be and in this case we are going to talk about people with hearing impairments. I will show each time the North Carolina definition for what it is. I don't want you know write this down and you will see one of the biggest reasons I don't want you to write this down in just a second because it is incredibly long. All I want you to do is be aware of what the definition is because the majority of you all will be working on a situation within the state of North Carolina so when and if you come in contact with a student with a visual impairment you will have some ball park idea. Now lets go ahead and look at the definition.

Slide 1

If you feel the need to write this down go ahead. In the state of North Carolina kids who are referred to as students with hearing impairments or students who are hearing impaired. This means that children with hearing impairments are those children with hearing losses which are disabling educationally and developmentally. Every time we look at a category if disability, hearing impairment, visual impairment, mental disability, learning disabilities the disability itself will have an impact in some size, shape, or form on the kids educational performance. If that doesn't occur and the impairment does not require that student something special to function in the classroom situation that kid would not make the kid meet the criteria of this person being identified. Hearing losses which are disabling educationally and developmentally and who with or without amplification may require various instructional modifications and related services in order to make full use of learning opportunities. Hearing impaired is a generic term which includes deafness and all hearing losses ranging from mild to profound. That definition is very long, and how comfortable are you now with what kids with hearing impairments look like. Do you know basically anything more that what you did before this definition was presented? Probably not. Definitions tend to be very useful. A general broad stroke to give some sense as to what this population is all about. We will go into more detail and look into the specifics of this. Basically a student with a hearing impairment is a kid who doesn't hear like everyone else.

Slide 2 Definitions

Slide 3

The term hearing impairment itself is that term that is used in IDEA. This term essentially suggests, tells us that the hearing loss an individual kid has is significant enough to warrant some type of special services. This term is basically the umbrella term, the broad term under which specific types of impairments fall. So all hearing impairments that term says there is something going on.

The first category of hearing impairment refers to those individuals who are referred to as deaf. Individuals who are deaf have a hearing loss that is so significant that that person does not understand speech. If you have a child in your classroom who is classified as being deaf, that person probably will not have hearing aids because they are not very effective. That child is that kid who learns primarily through visual modality. That is the kid that has to see or does a whole lot of very successful learning with hands on information. Hearing aids are not effective and vision is the primary modality for learning. That is the kid who is deaf. That loss is so significant that speech is a non factor.

The person who is referred to as an individual who is hard of hearing has a hearing loss that requires some type of adaptation. That adaptation typically is a hearing aid. We will talk more about that later on. That child who is hard of hearing can hear speech with typically the application of a hearing aid.

Slide 4 How we hear

So what we are going to do is look briefly at the process of hearing. So this is our ear canal and the sound enters that ear canal. As that sounds enters the ear canal it hits the ear drum and it looks like a drum. It vibrates and as the sound hits the ear drum is causes that vibration to occur. What happens then that vibration moves these little middle ear bones and those bones work in harmony to take that vibration that comes in and it passes along and through those bones to where there is a connection to the oval window in here. Those bones connect to that little membrane like thing called the oval window which causes that thing to move back and forth. Well that vibrates and sends the sounds into the inner ear and that is this stuff. The oval window vibrates and sends that to the inner ear. Up to that point we aren't really hearing anything. This all takes place instantaneously so when I say hi that vibration is transmitted into something and goes to the inner ear. The vibrations move to the semi circular canal, it looks like a nautalist shell and in that area it goes through the canal to the cochlea which is that thing that is in the inner ear with fluid. That vibration hits the fluid, obviously the fluid vibrates, and then it sends that information to the auditory nerve which then tells the brain that I said "hi." All that craop takes place for you to hear hi. It is an amazing process. It is an amazing process and amazing situation that this is all in place for the majority of people in the world. If anything happens along that path it can cause the individual to have an impairment of some sort. It is a progression, a system.

It is important to know what we do hear so we talk about measuring hearing loss.

Slide 5 Measuring Hearing Loss
Slide 6 Measuring Hearing Loss continued

Sound itself for those of you who are musicians, singers, or have some science background know more about this than I do. Sound is essentially made up of two different components. The first is decibels. Decibels are concerned with or look at the

loudness or intensity of a sound. The higher the decibels the louder the sound. Decibels looks at the intensity or loudness. Relative to the decibel levels, conversational speech at ten to twenty feet the sound, the intensity in conversational speech in that ten to twenty foot range is between 30 and 65 decibels.

Hertz is that measure of the pitch or the frequency of that sound. The hertz level is measured in cycles per second. If you have ever seen a graph of sound, a sound wave that is essentially the reflecting the hertz level, or frequency, or pitch of the sound. Females typically have higher pitched voices than do males. It is important in a classroom situation to take some consideration of that as you work with a person with a hearing impairment. As a human being you have a wide range of sound that we can hear. We can hear sound that is roughly twenty to twenty thousand hertz. That is important up to a point, there aren't many sounds up to twenty thousand hertz that we are going to be confronted with in day to day life so it is important for us as educators to look at the frequency range of conversational speech and that range is roughly 500 to 2,000 hertz. Your book gives a different range, it doesn't matter. Somewhere in this ballpark is important. Why is this range of conversational speech important? It is important because if a kid can't hear in that frequency or hertz range that kid is going to have a hard time hearing what is going on in a classroom situation. That kid without amplification is going to have a hard time hearing and therefore may be classified as a person with a hearing impairment.

My guess is is that everybody in this room has been hooked up to an audiometer. The audiometer is that machine that is used to screen your hearing. It enables the person doing the screening to produce sound at different decibels and hertz levels and present that sound to the person who is being screened asking that person to respond. If you remember, you put headphones on and your back was to the person. The person said when you hear the sound in your right ear raise your hand or put a block in this bucket on the right side. You heard those sounds at different hertz and decibel levels. If you were within a specific limit you were probably referred to different testing. So we use this audiometer and then what happens is we take the results and we put them on an audiogram. The audiogram is a graphic record of a child's responses in a hearing screening, it is a chart. ON that chart are recorded what it is the kid is hearing at, the different decibel and frequency levels. These two things are important because you will have potentially everyone or a significant majority of kids screened and you will see the audiogram and to have some sense as to what it is all about will be helpful

Slide 7 Types of Hearing Loss
Slide 8 Types of Hearing Loss continued
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Types of hearing loss. Because we have under this umbrella of hearing impairment we have both deaf and hard of hearing we look at different types, levels of loss which has dramatic impact on what we do. The first type of loss is a conductive hearing loss.

What happens in a conductive hearing loss is that there is some problem, some blockage or malfunction that occurs in the outer ear that precludes sound from getting into the inner ear, to the auditory nerve. So there is a block or a malfunction in the outer ear. The vibrations then as a result of that block don't get to the inner ear.

People with a conductive hearing loss, students and children, are the kids who are good candidates for hearing aids. This is a medical term that is essentially in our educational terminology that individual who is hard of hearing. That conductive hearing loss something is going on in the outer and middle ear so that there is a block that doesn't allow the vibration to get into the inner ear and again this is a person who is a good candidate for a hearing aid. There are bunches of different types of hearing aids that are available, the technology is unbelievable.

Now causes, almost every kid in the world but a significant majority of kids will experience a middle ear infection while growing up. Most kids have middle ear infections somewhere in the ages from 2 to 5 maybe. That ear infection isn't enough to cause a conductive hearing loss unless it goes untreated and causes damage as we move into the ear. One of the problems with middle ear infection is that kids can't hear because there is a build up of fluid in the middle of the ear and the sound can't penetrate that fluid and the really bad part is that it occurs two to five years which is huge in the development of a child. They can go through huge chunks of time where they can not hear things that are going on in their environment. Parents who aren't aware and can't afford medical intervention or those who don't have a clue will often not treat a middle ear infection and it can have a dramatic impact. The first cause of conductive hearing loss is a middle ear infection.

The next cause is the dreaded accumulation of ear wax. So causes… if you have something that ruptures your eardrum, not only is it painful it also leads to conductive hearing loss.

The next is the sensory neural hearing loss. It is more significant because sensory neural implies nerve involvement. It results in some damage to the inner ear. As a result of that damage in the inner ear there is a pretty significant impact on speech. Folks with a sensory neural hearing loss tend not to hear those high frequency sounds. From out perspective as educators that is important because consonant sounds are more high frequency sounds. Vowels don't carry much meaning, meaning that if we aren't hearing the consonants then there is a chance that we are not going to understand the sounds and the words that are being presented to us verbally. So we aren't going to hear the sounds and not going to understand the words.

Causes of sensory neural hearing loss. Presbicusis is something that we all will experience, old age. Our hearing deteriorates as we get old. The damage to our inner ear becomes significant. Consistent exposure to toxic drugs can result in a sensory neural hearing loss. Consistent exposure to loud noise can also cause a sensory neural hearing loss. With toxic drugs and noise it isn't just normal everyday kinds of things that will cause you to have a sensory neural hearing loss. It is consistent and extreme exposure to

drugs or the noise. You won't lose your hearing from listening to your IPods at a high volume unless you do it eight hours everyday for the year and then you risk the chance of that happening.

Infections, especially at an early age. Things like meningitis. It used to be a big issue and there have been cases recently. It attacks the nervous system and the meninges is the stuff that covers the nerves and meningitis attacks that and exposes the nerves which can be dangerous and detrimental.

Another cause of sensory neural loss is rubella, maternal rubella – an rH incompatibility. Both of these are less significant than they have been in the past. Maternal rubella vaccines exist and it has all but been eliminated. rH incompatibility, the rH factor in blood is either positive or negative and if parents have an rH incompatibility, one positive one negative it can lead to a child being susceptible to sensory neural hearing loss. It isn't significant in todays society because there is a shot given to a woman to essentially allows the blood to be compatible.

Slide 10 Possible Symptoms of Hearing Loss
Slide 11 What can teachers do
Slide 12 What can teachers do (continued)