Today's Objectives

- Describe the prevalence and symptoms of hearing losses.
- Identify communication, educational, and social challenges students with hearing losses often experience.
- Provide general information and resources to address these challenges in the classroom.

One in Five Americans Has Hearing Loss

“Nearly a fifth of all Americans 12 years or older have hearing loss so severe that it may make communication difficult, according to a new study led by Johns Hopkins researchers and published in the Nov. 14 [2011] Archives of Internal Medicine.”

Retrieved from http://www.hopkinsmedicine.org/news/media/releases/one_in_five_americans_has_hearing_loss

Hearing Losses on the Rise

The number of Americans with a hearing loss has evidentially doubled during the past 30 years.


Common Profile of People with Hearing Losses - 1

- Often undiagnosed or misdiagnosed
  - Symptoms may look like ADHD, learning disability, traumatic brain injury, or autism spectrum disorder
- Emotional issue
- Tend to deny or downplay
- Don’t realize what they don’t know
Common Profile of People with Hearing Losses - 2

- Don't have access to information or resources (don't even know they exist)
- Adults who grew up not understanding their hearing losses:
  - Often hide their hearing losses
  - Don't know/use most effective communication strategies or accommodations
  - This can cause lifelong interpersonal, learning, and employment issues.

Untangling Terminology

- People often identify their hearing losses incorrectly (hard of hearing, deaf, hearing impaired). They don't understand and can't correctly explain how they hear, when they misunderstand, and all the ramifications of this.
- Not understanding these things can create unrealistic expectations about what they can hear and understand. This can lead to avoidable:
  - Communication breakdowns
  - Interpersonal issues
  - Issues of self worth
  - Academic struggles

Terminology - 1

- Deaf
  - Most deaf people can hear something but it just isn't clear.
  - First rely on vision, then reinforce with any residual hearing they might have.

**Many deaf people call themselves hard of hearing (often because they don’t understand their hearing losses well enough to describe them accurately.)

Terminology - 2

- Hard of hearing
  - Usually can rely on hearing first but they reinforce it with vision (lipreading, reading notes, etc.)
  - Ex: may be able to talk on phone but don’t always understand the words

**Some people identify as hard of hearing but are actually deaf.

Terminology - 3

- Hearing impaired
  - Any hearing loss: mild loss to total deafness
  - Often misused and misunderstood
  - Some think it just means hard of hearing.
  - Others use it to only mean deaf.
  - Politically incorrect and offensive to many people

**Respect someone’s choice to identify as hearing impaired, but be aware that using this term can create unrealistic expectations about what someone hears and understands. It is likely the person doesn’t realize the confusion this term causes.

Types of Hearing Loss

- Conductive: Sound and speech sound quieter but are clear.
- Sensorineural (may or may not include nerves): Sound and speech sound quieter and garbled.
- Mixed
Factors Affecting Ability to Understand Speech

- Decibel (dB): volume
  - How loud must the sound be before the person can hear it?
- Frequency or Hertz (Hz): pitch or treble/bass
  - What pitches are impossible or difficult to hear?
- Speech sounds at 2,000 Hz and above account for 56% of speech intelligibility!

Standard Audiogram Symbols

Red = right ear  Blue = left ear

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Conduction (AC)</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>AC with Masking</td>
<td>Δ</td>
<td></td>
</tr>
<tr>
<td>Bone Conduction (BC)</td>
<td>&lt;</td>
<td>&gt;</td>
</tr>
<tr>
<td>BC with Masking</td>
<td>[</td>
<td>]</td>
</tr>
<tr>
<td>No Response</td>
<td>↓</td>
<td>↓</td>
</tr>
</tbody>
</table>

How to Read an Audiogram

- Audiograms on previous slides with explanation about how to read an audiogram retrieved from https://audicus.com/hearing-loss-reading-audiogram/.

Hearing Loss Simulation

- Listen to 4 sentences that have been mechanically altered to illustrate a moderate hearing loss in the high frequencies. These speech sounds are affected: ch, s, sh, f, unvoiced th (as in think), t, and k.

- Each sentence is repeated a second time in 2 or 3 segments.

- Write down what you hear.
The simulation on the previous slide is from Sound Hearing. It has a CD explaining and demonstrating hearing losses. There is an accompanying book. It is available for $12.95 from Harris Communications in Eden Prairie, Minnesota. [http://www.harriscomm.com/books-multimedia/coping.html](http://www.harriscomm.com/books-multimedia/coping.html).

Hearing Loss Simulators - 1

http://www.starkey.com/hearing-loss-simulator

Internet Explorer doesn’t work well with this one. Try Google Chrome.


http://facstaff.uww.edu/bradleys/radio/hlsimulation/

Hearing Loss Simulators - 2

Listening to a classroom story with a high-frequency hearing loss

http://www.ndcs.org.uk/family_support/childhood_deafness/what_does_a_hearing_loss_sound_like/two_minute_walk.html

Some Conditions That Often Co-exist With Hearing Losses

- **Tinnitus**
  - Ringing or other noises in the ears
  - Can affect ability to hear and understand speech.
  - May have extreme emotional ramifications

- **Vertigo or balance problems**
  - Meniere’s Disease (can also involve tinnitus)
  - Unpredictable
  - Can be totally debilitating

Unilateral Hearing Loss

- Hearing loss in only one ear
- An overlooked and underserved population
- Can have many difficulties that need accommodations

Common Difficulties Experienced by Those with Unilateral Hearing Losses

- Locating sound source (Can be a safety issue: Teach children to rely on eyesight for crossing streets, riding bikes, etc.)
- Understanding speech in background noise (especially if good ear is close to the talking)
- Maintaining attention and following classroom instructions and discussions
- Difficulty with schoolwork—especially language-based subjects (reading, writing, spelling, etc.)
Unilateral Hearing Losses (UHL) – Effect on Learning

- Repeated studies show up to 1/3 of these students repeat at least one grade.
- Difference between left and right ears
  - If hearing loss is in the right ear, student will tend to have more difficulty with language-related subjects. (Right ear processes sound in left/language side of brain.)
  - Those with right-sided UHL are held back a grade more often than those with left-sided UHL.

More Information on Unilateral Hearing Loss

Unilateral Hearing Loss
Boys Town National Research Hospital
Omaha, Nebraska

What is Unilateral Hearing Loss?
St. Jude Children’s Research Hospital

Ear Asymmetry

The Right Ear is from Mars
Anahad O’Connor
The New York Times

Your Ears Differ
Hear-it.org
http://www.hear-it.org/Your-ears-differ-

Most People Prefer Right Ear for Listening - June 24, 2009
Robin Lloyd
LiveScience
http://www.livescience.com/9679-people-prefer-ear-listening.html

Hearing Aid Basics

- Not like eyeglasses
- Users don’t always know how to effectively use them
- Work ideally one-to-one in quiet environment
- Not all people benefit from amplification.
- Benefits of aids are limited without also using effective communication strategies and other accommodations.

Factors Affecting How Effective Hearing Aids Might Be

- Degree and cause of hearing loss
- Recruitment (abnormal perception of increase in sound)
- Hyperacusis (extreme sensitivity to sound)
- Tinnitus (“ringing in the ears”)
- Temperature
- Background noise
- Has it been adjusted properly? Does the student know how to use the hearing aids?

Cochlear Implants

A cochlear implant is a surgically-implanted electronic medical device that replaces the function of the damaged inner ear. Part of it is inside the head. The external portion attaches to the head via a magnet. CIs are typically only recommended (but not always recommended) if the patient has a severed to profound hearing loss (in the deaf range) in both ears.
Cochlear Implant Videos

What does it sound like to hear with a cochlear implant?
An Oxford University student’s experience
https://www.youtube.com/watch?v=icPsm9RnO2E

Hearing Aids & Cochlear Implants

Even if someone wears a hearing aid or a cochlear implant, he or she still has a hearing loss. These devices do not simulate perfect hearing. Sometimes they can even make communication more difficult because they amplify sounds that interfere with hearing speech.

- People who are deaf may wear hearing aids to alert them to sounds, but the hearing aids do not help them perfectly understand people who are speaking.

Telecoils (t-coils) - 1

- A small copper wire inside a hearing aid or cochlear implant that acts as an antenna to connect to and better hear on the phone or with a variety of hearing assistive technology such as an FM system in the classroom
- Not all hearing aid users know what telecoils are or even how to activate them.

*See slides 75 - 77 for more information and a simulation on FM systems.

Telecoils (t-coils) - 2

- Please encourage students to activate telecoils in their HAs or CIs.
- Telecoils are “old” in technology terms, but they are still used and beneficial.
- Bluetooth capabilities in HAs and CIs do not replace the function of telecoils. They are used differently.

Hearing Loss Association of America information on Telecoils
http://www.hearingloss.org/sites/default/files/docs/HLAA_Telecoil_Brochure.pdf

Possible Signs of a Hearing Loss - 1

- Has language delays and speech difficulties
- Has slurred, mumbled speech
  - Missing high-frequency sounds like “s” and endings of words
- Frequently seems to not pay attention
- Often doesn’t respond or responds incorrectly
- Turns one ear toward the speaker
- Has puzzled expression when people are talking
- Often asks for repetitions
- Often talks louder or quieter than the situation merits

Possible Signs of a Hearing Loss - 2

- Frequent ear infections
- Childhood illnesses with high fevers
- Doesn’t follow directions
- Is easily distractible
- Has learning difficulties
- Socially withdraws
- Monopolizes or withdraws from conversation (especially in groups)
- Doesn’t realize you are talking unless s/he can see you
- Complains that people mumble
- Turns the volume on TV louder than is comfortable for others
Possible Signs of a Hearing Loss - 3

- Exhibits extra long lag time before answering questions or responding to comments
- Has difficulty following conversation in background noise
- Appears slow, lazy, unintelligent, stuck up, or rude
- Intently watches speakers’ mouths
- Is defensive about communication issues
- Frequently responds with a smile and a nod without further comments
- Often misunderstands words that sound similar or look similar on the lips

Hearing Losses May Appear to be Something Else - 1

- Students who are hard of hearing can miss learning about cultural and social rules and expectations because these things are learned through hearing. Therefore, some students with hearing losses might seem more immature or may not interact naturally or appropriately with others. This may be confused with some symptoms of ASD (autism spectrum disorder).
- Students who are hard of hearing must rely on their eyes to make up for what they can't hear; this can make them seem especially distractible or hyperactive. This may be confused with symptoms of ADHD.

Hearing Losses May Appear to be Something Else - 2

- If a student doesn’t respond because s/he doesn’t hear someone, others may mistakenly think the student is rude or stuck up.
- Students with hearing losses often miss hearing general information that their peers pick up informally (information that is not directly taught). Sometimes they won’t follow directions or answer questions correctly because they can’t hear and/or understand them. People sometimes attribute this to having a lower IQ or a learning disability when neither of these may be the case.

How To Identify Students With Hearing Losses

Identifying Students with Hearing Losses - September 2, 2014
American Hearing Aid Associates
http://phb.secondsensehearing.com/content/identifying-students-hearing-problems

Understanding Your Child’s Hearing Loss - 2016
Better Hearing Institute
http://www.betterhearing.org/hearing-loss-children/understanding-your-childs-hearing-loss

Speechreading Exercise

Charlie’s Lip Reading Challenge (4:20)
https://www.youtube.com/watch?v=PmtHrYbNfY

People with accents are more difficult for people with hearing losses to understand.
More Speechreading

The Lip Reading Game (1933) (2:08)
https://www.youtube.com/watch?v=HNQ38pmLbEs

Bad Lip Reading of the NFL (just for fun)
Some other videos in this series are a little crude.
https://www.youtube.com/watch?v=rRqKYXcL-2U

Speechreading

- It’s not just “lipreading”. A speechreader must also (in part):
  - look at the tongue, facial expression, gestures, and body language of the speaker
  - use visual cues, written information
  - use context and prediction skills
- Only about 30% of English is visible when spoken. Of that 30%, many words look alike.

Some Words That Look Alike
To Speechreaders

<table>
<thead>
<tr>
<th>B, P, and M look alike.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mom</td>
</tr>
<tr>
<td>Mob</td>
</tr>
<tr>
<td>Mop</td>
</tr>
<tr>
<td>Pop</td>
</tr>
</tbody>
</table>

All these words look alike!

<table>
<thead>
<tr>
<th>First letter: F and V look alike.</th>
<th>Last speech sound(s): T, D, N, S, and Z look alike.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan, fans, fanned</td>
<td>Fail, fails</td>
</tr>
<tr>
<td>Fat, fats</td>
<td>Van, vans</td>
</tr>
<tr>
<td>Fast, facts</td>
<td>Wav, wabs, waddled, waving**</td>
</tr>
<tr>
<td>Fatten, fattens, fattened</td>
<td>Vast, vastest</td>
</tr>
<tr>
<td>Fattest, fastest</td>
<td>Fact, facts***</td>
</tr>
<tr>
<td>Fattening**</td>
<td>Fax, faxed, faxes, facing***</td>
</tr>
</tbody>
</table>

*These are next to impossible to see. They are all articulated with the tongue in basically the same way.
**“ing” is invisible.
***The “s” sound in these words is made in the back of the throat—impossible to see.

Speechreading is exhausting!

- Speechreading requires total focus. Anything that distracts the speechreader even a little can make it harder or impossible to speechread something.
- Speechreading causes mental and eye fatigue. Fatigue causes more misunderstandings.
- Students with hearing losses should have good or corrected vision since their eyes will be used so much to supplement their hearing.

Never Assume

Don’t assume speechreaders—with or without hearing amplification—will always understand everything you say the first time you say it. Clear speech, smiling, and nodding do not guarantee someone with a hearing loss understands.

If you ask people with hearing losses if they understand you, they may think they do and say yes—when they really didn’t understand.
Use the S-P-E-E-CH technique.

- **S**: State the topic before starting to talk.
- **P**: Pace conversation—moderate rate and loudness with occasional pauses.
- **E**: Enunciate but don’t exaggerate.
- **E**: Enthusiastically communicate with body language, natural gestures, facial expression.
- **CH**: Check understanding before changing topics.

**Communication Strategies - 1**

- First get the attention of the student with the hearing loss. Ask student what is most comfortable.
  - Tapping shoulder
  - Waving
  - Walking up to student and coming into his/her field of vision
- Make eye contact.
- Adjust your speed. Not too fast, not too slow.
- Don’t exaggerate your speech.

**Communication Strategies - 2**

- Avoid environmental distractions.
  - Both auditory and visual distractions can interfere with understanding.
- Use facial expressions, gestures (like pointing), and body language that reinforce with what you are saying.
- Rephrase your message if it is not understood after a few tries.
- Expand your message. (Give more information so the student has more context.)
- Supplement with demonstrations, writing, maps, charts, etc. when possible.

**Communication Strategies - 3**

- Don’t assume the person with the hearing loss will always recognize a misunderstanding and tell you about it. Even people with good hearing can’t always do that.
- Use appropriate clarification techniques.
  - Ask open-ended questions instead of yes-no questions.
  - Explain something, then ask student to demonstrate what you just explained.
  - Let student know when you are changing the topic.
  - Demonstrate and talk separately if possible.

**Spoken Language Development - 1**

- People naturally learn spoken languages by listening to others speak them.
- A person who has had a significant hearing loss since birth or early childhood will use “unnatural” methods (such as vision instead of hearing) to learn a spoken language.
- So people with hearing losses do not have the same exposure to spoken language as people without hearing losses do.

**Spoken Language Development - 2**

- If someone is not exposed to English enough, it will make learning to read and write English more challenging.***
- It is also more difficult to speechread English if one is not fluent in English already.

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*This also pertains to any other spoken language.

**All academic subjects are generally taught using a spoken/written language. Therefore, having difficulty with the language can also affect how easily students with hearing losses learn other subjects.**
Some English Concepts That Are Often Harder For Those With Hearing Losses

- Vocabulary and multiple meanings
- Verb tenses
- Negations
- Function words
  - Examples: of, as, for, such
- Idioms
- Complex sentence structures
- Sight word lists aren't valid predictors of reading level.

See website at bottom of slide 68 for tips on how to teach many of these topics.

Common Reactions Hard-of-Hearing People Have To Communication Challenges - 1

(This information is from the writings of Sam Trychin. See the link to his article What Psychologists Need to Know About The Impact of Hearing Loss on slide 73.)

HOH people often react in the following ways to communication issues:
- Physically
- Emotionally
- Cognitively
- Behaviorally
- Socially

Common Physical Reactions - 2

- Fatigue
- Muscle tension
- Eye strain
- Other physical reactions brought on by stress

Common Emotional Reactions - 3

- Anger
- Irritation
- Fear
- Anxiety
- Depression
- Sadness
- Embarrassment
- Shame

Common Cognitive Reactions - 4

- Can't think straight
- Confused
- Hard to focus
- Easily distracted
- Difficulty making decisions
- Mind goes blank

Common Behavioral Reactions - 5

- Bluffing (pretending to understand)
- Withdrawing
- Blaming (“You mumble.”)
- Demanding (“You better face me.”)
- Dominating conversations
- Overdependence
Common Social Reactions - 6

- Self-isolation
  - Results from embarrassment or shame
  - Can lead to loneliness and depression

People with hearing losses often say they were teased or bullied when they were younger because of their hearing losses.

Some Classroom Accommodations - 1

- Preferential seating to allow best auditory and visual access to information
- Reduce auditory and visual distractions
- FM system* or other amplification meant for group settings (Hearing aids and cochlear implants aren’t best suited for group settings.)
- CART (real-time captioning)
- Closed captions on movies
- Allow extra time to read, do assignments, and take tests
*See slides 75 - 77 for more FM information and a simulation.

Some Classroom Accommodations - 2

- Quiet area to take tests
- Make sure student knows what is happening (Use a buddy system for alarms, getting in line for recess, etc.).
- Circle or semi-circle seating for groups
- Share “incidental” information one to one.
  - People with hearing losses are often left out of the loop and don’t have access to all the information others share verbally.
- Ask everyone to use effective communication strategies.

Some Classroom Accommodations - 3

- Alternately talk and demonstrate—not both at once.
- Ask open-ended questions to determine if student has understood. (Nodding, smiling, and saying “yes” don’t guarantee the student understands.)
- In group discussions:
  - Ask students to take turns talking. Toss a beanie baby to indicate turn taking and allow student with hearing loss to look at next speaker before s/he starts talking.
  - Repeat what students have said.
  - Refer to an agenda or outline or mention you are changing topics to help student with hearing loss know when you move on to the next activity or subject.

Some Classroom Accommodations - 4

Optimum communication requires that everyone use effective communication strategies. For this to happen, all students must be aware there is a classmate with a hearing loss. However, many students who are hard of hearing are uncomfortable disclosing their hearing losses. Include the hard-of-hearing student in any decisions about what to share with classmates. Discuss who will share anything and how.

Teacher Resources - 1

Unilateral Hearing Loss in Children – 2014
American Speech-Language-Hearing Association

Relationship of Hearing Loss to Listening and Learning Needs
Texas Hands and Voices
charts with varying degrees of hearing loss; each chart shows possible language and social impacts and possible accommodations
A Few National Resources

Better Hearing Institute
Provides information on hearing loss, tinnitus, hearing aids, and a directory of hearing care providers. Their website has an online hearing check with 20 questions to assess whether you have a hearing loss. Good information on recognizing and accommodating hearing losses in children and much more.
1441 I Street, NW, Suite 700  Washington, DC 20005
http://www.betterhearing.org

American Tinnitus Association
exists to cure tinnitus through the development of resources that
advance tinnitus research; publishes news magazine Tinnitus Today
522 SW 5th Ave, Portland, OR 97204  503-248-9985  tinnitus@atas.org

Information by Sam Trychin

Articles
- Why Don't People Who Need Them Get Hearing Aids?
  Samuel Trychin, Ph.D.
  http://www.hdhearing.com/learning/trychinart.htm

- What Psychologists Need to Know About The Impact of Hearing Loss
  http://www.e-psychologist.org/index.iml?mdl=exam/show_article.mdl&Material_ID=12

Sam's Website
Sam Trychin's books, DVDs, and trainings on living with a hearing loss (hard of hearing)
http://trychin.com

FM (frequency modulation) systems are used in classroom and other group settings because hearing aids and cochlear implants can’t work optimally there. A teacher/speaker uses a transmitter and a microphone; the listener has a receiver that amplifies the sound.
- If the listener is using telecoils, s/he wears a neckloop and plugs that into the receiver.
- If the person doesn’t have HAs or CIs or doesn’t have telecoils, s/he usually wears a headset.
- In some settings, the room is looped so someone with telecoils only needs to activate them but doesn’t need any additional equipment.

For More Information About FM Systems

Consult with Mary Bauer at Deaf and Hard of Hearing Services in St. Deaf and Hard of Hearing Services in St. Paul
651-431-5957
mary.bauer@state.mn.us

This simulation shows how hard it is for students to hear in classrooms with only their hearing aids. You will hear examples with a hearing aid and with an FM system—both in quiet and in noisy classroom conditions.
https://www.youtube.com/watch?v=JNzxOJKCUug