

Module 2: Understanding Hearing: How the Ear Works and How to Test Hearing in Infants

Section: Types of Hearing loss

Types of Hearing Loss

- Conductive
- Sensorineural
- Mixed
- Auditory Dys-synchrony (auditory neuropathy)

Activity 2.5: Guiding Families in Understanding the Implications of Various Types of Hearing Loss

- A. View the section of this module on “How the Ear Works” and discuss how it relates to “Types of Hearing Loss”:
- Review the structures of the hearing mechanism.
 - Discuss the job of each structure and how the structure supports hearing (e.g., “The outer and middle ear carry sound through to the inner ear. Discuss how a problem in these areas may stop or slow down/decrease the sound on its way to the inner ear.”).
 - Use the discussion of the hearing mechanisms to better explain each type of hearing loss (e.g., where the difficulty is located, how the sound is being affected, resulting effect on access to sound).
 - Specifically describe how their child’s hearing is changed by a change in the workings of the hearing mechanisms. Refer to diagrams/models of the ear to support this discussion.
 - Use this discussion to lead into conversation about the options available to support access to sound (e.g., possible medical management of a conductive loss, hearing aids, cochlear implants) and language (e.g., visual language, spoken language).

- B. Discuss the 4 types of hearing loss explained in *Setting Language in Motion: Family Supports and Early Intervention for Babies Who Are Deaf or Hard of Hearing*:

1. Conductive

Description: When there is a barrier to sound transmission through the outer and/or middle ear to the inner ear and auditory nerve, this is referred to as a *conductive hearing loss*. The components of the ear responsible for sensing sound are intact and ready to accept incoming sounds; however, sound cannot adequately reach these components of the auditory mechanism. Common causes are excess wax in the outer ear or fluid behind the eardrum in the middle ear. Many conductive issues are temporary and can be resolved with medical treatment. Some children, however, may have long-term or permanent conditions that are more difficult to remedy, such as malformations of the outer and/or middle ear.

Implications: When there is a barrier to sound reaching the inner ear, this causes sound to be muffled or quiet. Moving closer to or increasing the loudness of the sound source may be helpful in improving the ability to hear and understand. The duration and nature of the outer or middle ear barrier will influence the level of hearing challenge. If the condition is brief and not frequently recurring, it should not affect language or academic development. If the blockage is chronic or repeated, it may influence speech, language, and educational performance and require intervention strategies. Use of a hearing aid or other assistive listening device may help children experiencing a long-term conductive issue.

2. Sensorineural

Description: When areas of hair cells in the cochlea of the inner ear and/or the auditory nerve are nonexistent, malformed, or not effectively functioning, this is referred to as a *sensorineural hearing loss*. The outer and middle ear are functioning and transmitting sound; however, there is a breakdown in the inner ear responsible for sensing sounds of varied frequencies (pitches) and/or a breakdown in the auditory nerve responsible for conveying sound to the brainstem and then the brain. There are many different causes of sensorineural hearing loss, some developing before or during birth and others having a later onset. These types of conditions are usually permanent and cannot be remediated through medical interventions.

Implications: The nature and extent to which the hair cells in the cochlea and/or the auditory nerve are impacted will influence a child's ability to hear and understand spoken language. In addition to causing listening challenges related to the loudness of sound, these conditions may also include distortion in the hearing system. Each child is unique in how he or she may benefit from amplification (e.g., hearing aid, cochlear implant, other assistive listening device) to understand spoken language.

3. Mixed

Description: This type of hearing loss is a combination of both a conductive and a sensorineural loss.

Implications: The overlap of these conditions presents a cumulative listening challenge relative to the extent of each condition. The sensorineural part of the loss typically remains stable; however, depending on the cause of the conductive situation (e.g., fluid in the ear), a student may experience a fluctuation in hearing levels. When hearing levels fluctuate, it can impact day-to-day listening and attending as well as the effectiveness of a student's hearing aid(s).

4. Auditory dys-synchrony

Description: This is also referred to as *Auditory Neuropathy Spectrum Disorder (ANSD)*. This condition is related to a problem in the transmission of sound from the inner ear to the brain.

Implications: Ability to hear and interpret sound varies. Children may demonstrate an inconsistent ability to hear and understand sound. They may or may not benefit from hearing aids and/or cochlear implants to learn spoken language. Visual language may be a consistent and reliable way for these children to have access to language.

C. Discuss how a child's type of hearing loss impacts:

- hearing ability (e.g., loudness level of sounds heard, clarity of sounds, distortion in his or her listening system);
- language acquisition (e.g., Will their child have enough access to sound to learn spoken language? How can American Sign Language promote effective access to language?), and
- amplification choices (e.g., Will the child be a candidate for a hearing aid? What about a cochlear implant? What about other listening devices?).

D. Discuss other considerations related to type of hearing loss.

- What causes various types of hearing loss?

- E. Can a specific type of hearing loss improve as a child gets older?
- F. Considerations for families of a child with identified disabilities:
- Discuss how the child's type of hearing loss may or may not be related to additional disabilities the child may have.
 - Discuss whether hearing or other disabilities are of primary/secondary concern.

Additional Resource:

- [ASHA Patient Information Handouts: Hearing Loss](#)

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