

Choosing Assistive Listening Systems for Students with Hearing Loss

By Rebecca Morris

Disabled student service providers and vocational rehabilitation counselors are on the 'front line' addressing the needs of hard of hearing individuals. You are the professionals who need to understand the communication obstacles, introduce technical solutions and other support services to hard of hearing students. It often falls on you to also train and counsel individuals on the use of these services and technology.

Before learning about technology solutions, it is important to begin with a primer on hearing loss definitions that are standard in the field of hearing loss. We will be focusing on how to accommodate individuals who are hard of hearing, who rely on their residual hearing, who don't know sign language and who probably wear hearing aids.

Many students fresh from high school may already have experience with services and technologies that have enabled them to communicate in a classroom setting. However, many adult students returning to the classroom have never been exposed to assistive technology. They may have never experienced the benefits of an ALD. To make it clearer for people new to the technology, we'll refer to the ALD as an FM system.

Communicating effectively in the classroom can be accomplished with a variety of technology solutions.

Hearing Loss Definitions:

There are several standard definitions that are used in the field of hearing loss that will be helpful to you in understanding hearing loss and how accommodations can vary. **Hearing loss** is a general term referring to all people with hearing loss.

Hard of Hearing refers to people who have some degree of hearing loss ranging from mild to profound and who can benefit from hearing instruments or assistive listening systems. They function in the hearing world and depend primarily on their voice to communicate and will usually be understandable.

Deaf with a capital 'D' refers to people who are culturally Deaf, who are members of the Deaf community and who use American Sign Language as their primary mode of communication.

Late Deafened refers to people who have lost their hearing after learning speech and must depend on their vision to communicate. These individuals receive very little benefit from hearing instruments or assistive technology. They function as a hard of hearing individual but rely on finger spelling, speech reading, written notes, gestures or some other form of visual/manual communication. They do not associate significantly with the Deaf community.

Understanding the relationship between hearing instrument options and FM system options can mean the

In a 'perfect' world, the audiologist or hearing instrument professional would be the first point of contact for solutions that extend beyond hearing aids to include ALDs, or FM systems.

However, most students' first exposure to assistive listening systems will be when they meet you.

difference between successful communications and unnecessary hardship for a hard of hearing student. In a 'perfect' world, the audiologist or hearing instrument provider would be the first point of contact for solutions that extend beyond hearing instruments to include ALDs, or FM systems. However, most students' first exposure to assistive listening systems will be when they meet you.

You don't have to become a hearing instrument specialist and assistive device specialist to choose effective technology. You only need to understand how three components relate to choose an effective system. The components are 1) the FM system listening option 2) the type of hearing instrument 3) the hearing instrument options.

NUTS AND BOLTS

HOW DOES AN FM SYSTEM WORK?

An FM system consists of two units. The transmitter uses a microphone that is clipped to the lapel of the speaker. It transmits the sound using radio frequency to the other unit, a receiver worn by the person with hearing loss. The receiver converts the sound to a signal that is delivered to the ear with a listening option.

An FM system is designed to overcome distance from the speaker and unfavorable listening conditions such as room acoustics and reverberation by placing the microphone close to the sound source. It then delivers the sound to the ear to produce a clear sound signal.

FM SYSTEM LISTENING OPTIONS

There are 4 basic FM system listening options (or interfaces).

Headphones – standard headphones that fit over the head (and don't appeal to many students). Behind-the-head headphones are more cosmetically appealing.

Ear hook – basically half a headphone that fits over one ear with an adjustable hook. It is more appealing because it is more discreet.

Neckloop – this loop fits over the neck and creates a special signal that a hearing aid telecoil can pick up. It allows the hearing aid to use its' full power.

Earbud – this single earbud fits in the ear, in place of a hearing aid.

HEARING INSTRUMENTS

CICs - very smallest instruments that fit completely-in-the-canal.

ITEs – instruments that fit in-the-ear.

BTEs – instruments with an ear mold that fit in the ear and attach to the aid behind the ear.

CI – cochlear implant speech processors that fit behind the ear.

HEARING INSTRUMENT OPTIONS

Generally, ITE and BTE aids as well as Cochlear Implant processors have options available that allow them to interface with an FM system. These options are a telecoil and direct audio input. A **Telecoil** is a special circuit in the hearing aid that allows the hearing aid to pick up a sound signal from the FM system interface. This option allows the person to use the full power of the hearing aid without squealing or feedback. **Direct Audio Input** (or DAI) uses a special boot and cord that snaps onto the hearing aid and directly connects to the FM system.

PUTTING THE PUZZLE TOGETHER

Headphones are for mild to moderate loss. They can be used with no hearing aids, CICs, some ITEs or BTEs. They may cause feedback and sound leakage at higher volume levels. This sound leakage could cause distraction to others.



Ear hooks are also for mild to moderate loss. They can be used with no hearing aids, CICs, most ITEs and BTEs that do not have telecoils. They may cause feedback and sound leakage at high volume levels. This sound leakage could cause distraction to others.



Neckloops are for moderate to severe hearing loss. They can only be used with ITE or BTE hearing aids with the

telecoil option. It can also be used with most BTE Cochlear Implant processors. This is effective for people with more severe loss because it bypasses the hearing aid microphone eliminating the possibility of feedback or sound leakage. This also allows binaural listening.

Direct Audio Input is for severe to profound loss. The boot and cord snaps onto the BTE hearing aid and plugs directly into the FM system. It provides a direct connection and allows the hearing aid microphone to remain on (to pick up environmental sounds) while also picking up the FM system signal. Another option similar to DAI is a connector cord that runs from a cochlear implant user's speech processor to the FM receiver.

PRACTICAL APPLICATIONS

Let's pull together what we've covered to address the needs of students in these two case studies. These are typical student backgrounds and experiences.

Student Profiles:

Mary is a young adult who has a severe hearing loss. She has just graduated from high school. She has good speech skills, wears high-powered hearing instruments and has used an FM system in high school. She may only know of this system as an 'auditory trainer' and may not be familiar with the term 'assistive listening system'. She is working with a vocational rehabilitation counselor.

Mary used the system in school with either a neckloop or direct audio input. She will need a comparable FM system to the one she used in school. You'll want to try to find out which system she used in school. She'll tell you which option she needs and is accustomed to. She doesn't need much training or support on the equipment.

John is 45 years old. He is currently employed. He has a moderate hearing loss and wears in-the-ear hearing aids. If you ask him if he's used an assistive listening system before, he will have NO IDEA what you are talking about. He may not even know that good amplified telephones exist. He will not be able to tell you if an FM system will work because he has never experienced one before. You are the first person to explain the system to him.

You will need to ask John if he has a telecoil on his ITE aids. He may not know this terminology and you can ask if he has to change a switch on the aid to use the telephone. If he does not have a telephone switch (or telecoil), then his options are more limited. If John describes difficulty following along in class, then he most probably will benefit from an FM system. You will want to allow him to test one in class. You'll need to explain how it works and he may need additional counseling on how to use the system and work with the professors in using the system.

John may benefit from an earhook listening option or behind-the-head headphones. He may balk at wearing over-the-head headphones and may find the single ear hook adequate. Your concern will be if the hearing aid squeals when you use the earhook.

Sometimes it is helpful to turn down the hearing aid a little to help prevent the feedback. John's other option is to remove his hearing aid and use the earbud.

GATHERING YOUR PUZZLE PIECES

A systematic process of obtaining information can help you document and assess the communications needs of new students. Hard of hearing students who reside on campus may also have the same needs as deaf students in regard to visual safety alarms and the need for telephone access.

We have developed a questionnaire available to you free of charge. You can customize it and use it to help manage the information you'll need to determine the most appropriate accommodations for your students who are hard of hearing.

USING YOUR RESOURCES

By now you have a grasp of the terminology of hearing instruments and assistive listening system options. You are now in a position to look at product information and understand how it works.

We intentionally did not cover assistive listening systems that use other means of transmitting sound signals like an audioloop or infrared system. We also did not go into detail on *all* ALD listening options, hearing aid options or cochlear implants.

You have an abundance of excellent resource materials at your fingertips. You can use an assessment tool to assist you in gathering important information to help you choose appropriate technology. There are organizations and companies that can provide guidance and support on the technology issue as well as all the other support issues that you face.

You don't have to become an expert and have all the answers to be effective, you just have to know how to find good resources.



Becky Morris is owner and President of Beyond Hearing Aids, Inc., a distributor of FM systems and other assistive hearing technology. As an assistive device specialist supporting professionals working with people with hearing loss, Becky has developed training workshops and materials to assist and support disability service providers and vocational rehabilitation counselors. She is an international presenter and workshop trainer. Becky also provides technology assessment consulting services summarizing communication needs and identifying appropriate technology for home, work and school.

Contact the author in c/o: Beyond Hearing Aids, Inc., 463 Erlanger Rd. Ste. 1, Erlanger, KY 41018, telephone 800/838-1649, fax 859/342-4979, e-mail: beckym@beyondhearingaids.com.

REFERENCES AND OTHER SUGGESTED RESOURCES

1. Northeast Technical Assistance Center NETAC at RIT offers many excellent resource materials; Rochester Institute of Technology, National Technical

Institute for the Deaf, 52 Lomb Memorial Drive, Rochester, NY 14623-5604, Department of Audiology: 716-475-6866 (v/tty) <http://netac@rit.edu>

- “The Role of Assistive Listening Devices in the Classroom”
 - “Teaching Students Who are Hard of Hearing”
 - Teacher Tip Sheets
2. Postsecondary Education Program Network has regional resource centers and publications available; www.pepnet.org
 3. Hearing Loss Association of American (formerly SHHH) Catalog has many reprint articles available; www.hlaa.org
 4. “Demystifying ALDs – The Devil’s in the Detail” by Cheryl Davis, Northwest Outreach Center, <http://www.wou.edu/nwoc>

copyright 2007

Please contact the author for reprint permission.