EFFECTIVE COMMUNICATION
FOR PEOPLE WHO ARE DEAF OR HARD OF HEARING

OVERVIEW OF HEARING LOSS

Approximately 48 million American adults report some degree of hearing loss.[1] Hearing loss is a spectrum disability. The type of assistance required is dependent on a variety of factors including but not limited to the person's degree of hearing loss, whether a hearing aid or cochlear implant is used, the age the person lost hearing, the level of auditory training received, the person's current age and the nature of the listening situation. The chart (Exhibit A) provides an overview of the type of assistance needed based on the degree of hearing loss. The assistance required is not as precise as the chart appears since there is overlap between groups.

Three types of access should be offered whenever there is sound output (live voice or recorded audio) in order to have full and consistent access for people who are deaf or hard of hearing:

1. Assistive listening system/device (ALS) *and*
2. Captioning (for prerecorded or prescripted presentations) and CART (for live presentations) *and*
3. Qualified interpreters

OVERVIEW ON TYPES OF ACCESS AVAILABLE FOR PEOPLE WITH HEARING LOSS

A. Auditory: Assistive Listening System/Devices

In the US, the Americans with Disabilities Act of 1990 (ADA) requires that all places of public accommodation with 50 or more fixed seats provide an Assistive Listening System (ALS). (The elimination of the fixed seat requirement is awaiting the Department of Justice's approval.) A lower number is recommended such as 20 seats since many smaller public venues still pose difficulty for people with hearing loss.

1. How an ALS works

A signal is transmitted through an ALS. The systems, currently, available are

[1] "Basic Facts About Hearing Loss | Hearing Loss Association of America." HLAA Updates. 2015. Accessed November 28, 2015. http://www.hearingloss.org/content/basic-facts-about-hearing-loss.

either a radio frequency (FM), infrared light or magnetic induction to the receiver, which may be either an Assistive Listening Device (ALD) or a telecoil (T-coil) in a hearing aid or cochlear implant. ALDs enable visitors to increase the volume and receive the sound directly from the source of sound to their ear, which eliminates the negative effects of distance, noise and reverberation on sound clarity.

2. Benefits

Hearing a presentation provides certain benefits. An ALD allows someone with residual hearing to have an equal opportunity to effectively participate and receive the same benefits of sound (loud, soft, angry, happy, sad, singing etc.) with a reasonable modification.

3. Types of ALS' (The Transmitter)

There are, currently, three types of ALSs available:

- FM- works via a radio frequency.
- Infrared- works via a beam of invisible light.
- Induction Loop- is an audio frequency magnetic signal.

There are several factors that would determine which system is effective for each site. Some factors to consider include but are not limited to environmental concerns, privacy issues, the setting, portability, the size of the space, the environment, construction materials (for instance, metalwork can absorb or distort magnetic fields – see below), the impact of installing the system in the space and cost.

- FM 

An FM radio system works well in large spaces, outdoor settings and where an induction loop or infrared system cannot work due to electromagnetic interference or bright light, respectively.

An FM system is not suitable if there is the possibility of FM interference e.g. airplanes or if there are privacy concerns since the FM signal can be picked up outside the room. Most Broadway theaters do not use an FM system because someone could stand outside a theater and record the signal.

Portable FM systems are also ideal for guided tours in order to overcome poor acoustics that can challenge even people who do not have a hearing loss. This type of system also works well for a room that, typically, does not have the need for a permanent system, as a back-up system when the main system fails or in places that cannot have a system easily repaired such as on cruise vessels.

- Induction Loop 

An induction loop system utilizes an electro-magnetic coil to create a magnetic field. Unlike FM and infrared systems, induction loops are hearing aid compatible. Hearing aids or cochlear implants with T-coils receive the sound signal directly via their T-coil. Many hearing aids and cochlear implants worn by people now have a T-coil. Phones, audio guides or sound enhancement devices that are T-coil compatible have a transmitting inductive coupler within the device.

The construction materials used in a building impact whether an induction loop can be utilized and how it needs to be configured. This could impact whether the system can be used in post-construction settings. It is important that the system when installed meets the IEC60118-4 standards for field strength and frequency response. An induction loop is often placed in a simple perimeter configuration in small settings but a more sophisticated arrangement may be required in larger settings.

With an induction loop system, people with T-coil equipped hearing aids or listening devices conveniently avoid the need to self-identify, locate, check out, wear and return visible headsets or neck loops. The venues do not need to distribute or maintain as many headsets or neck loops. The loop system maximizes the customized output of the person's own hearing aid. Thus loop systems, when installed, are more likely to be used. Receivers and headsets should still be available for those without suitably equipped hearing aids.

Because of their user-friendliness, induction loops have become the major assistive listening technology around the world. Induction loops are the only type of ALS, currently, available in transitory settings such as mass transit when there is insufficient time to distribute and collect the receivers.

- Infrared 

An Infrared system works via a beam of invisible infrared light. This system affords privacy since the receiver must be in the path of light to receive the signal, which itself is confined by the walls of the room or auditorium. Many Broadway theaters utilize this system.

This system does not work well in large stadium settings where the distance is too great to receive the signal or in daytime outdoor settings where the daylight interferes with the signal.

4. ALDs (The Receiver)

There are different styles of receivers for assistive listening systems. Ear bud headsets are available that fit directly into the ear. They are not recommended, since they require people with hearing aids to remove their aids. Many people are also uncomfortable inserting something in their ear that has already been inserted in another person's ear even when cleaned.

Other types utilize headphones or neck loops plugged into the output jack of the receiver, which is typically the size of a deck of playing cards. Headsets typically do not work for people who wear behind-the-ear (BTE) hearing aids and for some people who have more than a mild hearing loss, because the sound output is likely to be insufficient. The design of some headsets means that they don't confine the sound to the listeners' ears, and other people nearby could be disturbed. The headset should be to suit the circumstances.

People who have T-coils in their hearing aid or cochlear implant can receive signals directly through their hearing aid/cochlear implant when an induction loop is used. However, they will need to use a neck loop in conjunction with an FM or infrared receiver to convert the FM or infrared signals to a magnetic field that can then be picked up by their T-coil. Neck loops allow the person's own hearing aid or cochlear implant to regulate the volume. The FM or infrared receiver must have a jack for plugging in the neck loop. Most one-piece headsets lack jacks.

It is important to ensure that a sufficient number of receivers are available at any given place of assembly. In the US, the requirements are detailed in the ADA Accessibility Guidelines ("ADAAG"). ADAAG can be found at www.access-board.gov.

5. Considerations

Some considerations to keep in mind when installing and using an ALS:

- The entire space should receive the signal.

It is important to check the signal at each seat especially under overhangs. There should not be any dead spots.

- High-quality microphones should be used to ensure best possible quality of sound.

- The distance between the microphone and the speaker should be minimal in order to provide sufficient clarity.

When speakers are not talking from a microphone-equipped podium, they should be provided with wearable microphones rather than these being placed on the stage or hanging from the ceiling. Stage or ceiling microphones are, however, suitable as a back up but not as a primary source of sound transmission.

- The equipment should be tested and maintained regularly.

The ALS equipment should be checked and maintained regularly similar to other equipment. Rechargeable batteries should be charged daily.

B. Visual

1. Benefits

ALDs should not be expected to benefit the full spectrum of people with hearing loss. Some people with hearing loss are unaware they cannot hear well, are in denial about having a hearing loss, or may have a hearing loss that is too severe to enable them to benefit from an ALD. (See Exhibit A) A visual component is needed but it is not substitute for the auditory part. Both are necessary since people with residual hearing will want to hear and many people use captioning to fill in the words they miss. Reading does not have the same impact as hearing the spoken words. That is why silent movies no longer exist. In addition, captioning does not generally work for children below approximately nine years old because most don't have sufficient reading skills.

2. Types Available

The visual offering is dependent on a variety of factors including but not limited to whether the situation is transitory, whether the person need to respond, whether the person need to look at a particular place at a particular time or is the communication brief.

a. Captioning

Captioning is the written form of what is stated similar to a court reporter transcribing a witness' statement except it incorporates additional details including the identification of the person speaking, background sounds, music, and unstated feelings. Captioning should have a high degree of accuracy and reflect what is stated. It might seem obvious but, sadly, it isn't. Poor quality captioning does not provide effective access. The captioning standards detailed by The Association of National Advertisers in *The Benefits of Closed Captioning Commercials* should be utilized. [2]

Captioning contracts should include standards and not be selected based on price alone. There are two types of captioning, open or closed.

- Open Captioning (OC) 

Open captioning is always visible and is recommended since the captioning is always visible. The captions appear either directly on the film, on a data strip

[2] https://janiceslintz.files.wordpress.com/2015/03/ana_closedcaption_whitepaper-f.pdf

below the film, on a data screen adjacent to the lecture or a play or on the scoreboard at a sporting event. It should not appear above a film or in an area adjacent to the event. Visitors are not required to self-identify to receive the assistance they require and staff time is also saved, since employees do not need to activate the captions.

OC should be offered for lectures and other spoken presentations. This type of captioning is also known as Communication Access Real-time Translation (CART). CART is live verbatim captioning. It provides access for people whose hearing loss is more profound and cannot or will not use the ALS. CART should be offered for specifically scheduled lectures, presentations or when requested.

The CART provider's captioning skills must be checked prior to hiring the company. Poor quality CART does not provide effective access. Also, the CART provider should ensure there is a back-up person in case of illness or emergency.

- Closed Captioning (CC) 

Closed captioning is not recommended since it needs to be activated and the captions are only seen by those who self-identify. The captions are either seen on the screen only when someone turns on the captions or when a special data panel is affixed to the seat which is called Rear Window® Captioning. The data panels need to be cleaned and maintained after each use. Closed captioning is useful for DVDs.

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b. Paper and Pen

Paper and pen should be available at all concession; information and ticket desks for people to write their questions down and/or receive answers. This method is not effective for more than a few words but is an important back up.

c. PDAs

Personal Digital Assistants (PDAs) are hand held devices that contain can display text. They are not effective as communication aids when there is a corresponding visual component that requires a person to look at a specific place, at a specific time such as at a theater, on an amusement park ride or while watching a video since it is impossible to read the text and look at the location simultaneously. Drivers are not permitted to read PDAs while driving for this reason. In addition, a person may need glasses when reading a PDA but not for distance. Changing back and forth is awkward, disruptive, frustrating and can cause eyestrain.

A PDA is preferable to a transcript because information can easily be searched on a PDA and it is less bulky than a large transcript. They are useful to communicate in one to one situations.

d. Transcript 

Transcripts are only effective when they are short, time is not of the essence, the communication is only oral with no corresponding visual component such as radio broadcasting or audio recording so the person is not required to look at a specific place at a specific time. Transcripts should be available in regular and large print.

Unlike a PDA, a transcript's information cannot easily be searched and the transcript can be cumbersome.

C. Qualified Interpreters 

Qualified interpretation such as American Sign Language (ASL), oral, transliteration or cued speech needs to be offered in the format that an individual requires to achieve effective communication. ASL is a visual language with its own syntax and grammar that is quite different from spoken/written English language.

Qualified sign interpretation should be offered for scheduled and/or announced events and/or upon request with reasonable advance notice. Other forms of interpretation should also be available upon request. All interpreters should be certified. The qualified interpreter should ensure there is a back-up person in case of illness or emergency.

The majority of people with hearing loss do not use sign language. It should still be included as a component of access but it is not a solution for access.

CONCLUSION

Access should cover the full spectrum of people with hearing loss. Three types of access should be offered whenever there is sound output (voice or audio) in order to have full and consistent access for the entire population of people who are deaf or hard of hearing:

1. Assistive listening system/device (ALS) *and*
2. Captioning (for prerecorded or prescripted presentations) and CART (for live presentations) *and*
3. Qualified interpreters

Hearing Access & Innovations f/k/a the Hearing Access Program, was established in 2002. It is the only company dedicated to helping the world's corporations, cultural and entertainment institutions, government agencies, and

mass transit organizations improve their accessibility for people with hearing loss. This document was developed in consultation with organizations representing people with hearing loss.

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EXHIBIT A: Hearing Loss Overview
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POPULATION CHART

Hearing Loss Population = 48 Million[1]

Nature of Loss	Potential Accommodation
• Mild to Moderate	• Assistive Listening Device (Headset) • Captioning
• Moderate to Severe	• Assistive Listening Device (Neck Loop, Headset or Induction Loop System) • Captioning
• Severe to Profound	• Assistive Listening Device (Neck Loop or Induction Loop System) • Captioning • Qualified Interpreter

1. "Basic Facts About Hearing Loss | Hearing Loss Association of America." HLAA Updates. 2015. Accessed November 28, 2015. http://www.hearingloss.org/content/basic-facts-about-hearing-loss.