



2015 Southwest Orientation and Mobility (SWOMA) Conference

Audiology and Orientation & Mobility Collaboration

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3:00 PM-4:30 PM

Presented by:

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Audiology and Orientation and Mobility Collaboration

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Which Specialists are Involved?

- Audiologist
- Teacher of the Deaf and Hard of Hearing (TDHH)
- Speech and Language Pathologist (SLP)
- Teacher of Students with Deafblindness (TDB)
- Intervener
- Orientation and Mobility Specialist (OMS)
- Teacher of Students with Visually Impairments (TVI)

What role does everyone play on the Team?

- Delineation of Roles Document
- Collaboration from all team members
- Addressing the Expanded Core Curriculum for visual and auditory areas

What's included for students who have dual sensory loss?

- We are going to take a look at two areas.
 - IEP Quality Indicators for Students with Deafblindness
 - A hierarchy of hearing for orientation and mobility

IEP Quality Indicators

https://www.tsbvi.edu/attachments/other/IEP_Indicators.pdf

7. Orientation and Mobility (O&M) – Deafblindness affects the ability of students to know where they are, and how to go from place to place. Certified O&M Specialists (COMS) will find that working with this population may require some changes in instructional approaches. Students with deafblindness get less information from the environment, and have a lower motivation to explore. Deafblindness affects the identification and use of sound cues. Students need more orientation to environments, and strategies to gather information about their surroundings.

IEP Quality Indicators

Please Circle Your Answer:

Y: for Yes

N: for No

N/A: for Not Applicable

IEP Quality Indicators

- 7.1. The student's level of exploration and movement is evaluated in light of the effects of deafblindness.
- 7.2. O&M evaluation and programming reflects the effects of hearing loss on the student's ability to localize and identify sound cues.

IEP Quality Indicators

- 7.3. The IEP reflects a plan for the Certified O&M Specialist to receive support from the team (i.e. support from an interpreter, intervener, or teacher of the deafblind) in utilizing the student's communication system during instruction.

IEP Quality Indicators

- 7.4. Instruction as reflected in the IEP provides adequate information for the student to establish a destination and recognize a particular route (use of a communication system to establish a destination, use of the calendar conversation, additional time to explore the salient parts of the route).

IEP Quality Indicators

- 7.5. Instruction as reflected in the IEP provides supplemental information about the environment to offset the lack of incidental learning (what is a mall? Or a bus?) by experientially teaching concepts and related vocabulary.

IEP Quality Indicators

8. Related and Supplemental Services – Certain related services and supports are designed for students with sensory impairments, and should be considered for all students with deafblindness. For example, an intervener is a paraprofessional with special skills and training who is designated to work individually with a student who is deafblind. Sign language interpretation and O&M are also examples of specialized services. Additionally, the effects of deafblindness should be taken into account in assessments, evaluations and delivery of all related services provided to the student. For example, optimal positioning for communication access should be considered by the physical therapist. Counselors may need to address changes in vision and hearing experienced by a student with deafblindness.

IEP Quality Indicators

- 8.2. There has been an O&M evaluation that addresses the effects of hearing loss in combination with the vision impairment in determining the need for services. (Refer to Section 7 on Orientation and Mobility.)

Hierarchy of Hearing

Detection - I hear it...

Discrimination - Those sounds are different...

Hierarchy of Hearing

Identification - I know what that sound it...

Comprehension - I know what that sound means...

And on to...

Utilization

Utilization of Environmental Sound

- Localization
 - Where is that sound; is it moving?
 - Which direction and how quickly?
- Estimation
 - How far away is that sound?
 - When will it arrive where I am?

Utilization of Environmental Sound

- Echolocation (reflected sound)
 - Passive
 - Active
- Orientation
 - Spatial updating
 - Planning travel
 - Maintaining travel

How To Translate O&M Speak

Just in case you were not sure, most people do not understand...

“Traveling with the parallel traffic surge using auditory alignment strategies when crossing at a multiphase intersection in a metropolitan area with a fully actuated signals that are equipped with vibro-tactile APS.”

How To Interpret Audiology Speak

And you might likely need a bit of guidance to understand...

“We need to consider mic directionality and the effects of noise reduction and suppression, and how these effects might be exacerbated by the lack of ear mold venting. This is especially true for clients with devices employing compression with binaural amplification and or using multiple programs. Of course, another consideration is the potential use of FM+M setting.”

Where to begin?

- IEP Quality Indicators for Students with Deafblindness
- Informal Functional Hearing Evaluation (IFHE)
- Audiology and Orientation and Mobility Collaboration Tool

And there's more...

- Environmental Sound Considerations
- Environmental Sounds Evaluation

Where do I find resources?

- LiveBinders
 - Suzie Tiggs, Region 11
 - Chris Tabb, TSBVI
- Web sites
 - National Center on Deaf-Blindness
 - Texas School for the Blind and Visually Impaired (TSBVI)
 - Perkins School for the Blind

Where do I find other resources?

- Apps
 - Decible recording apps
 - Audiological screening apps (does not replace need for Audiological Screening and Evaluation)

Thank You for Joining Us!

Audiology and Orientation and Mobility Collaboration

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Delineation of Roles Related to Safe and Independent Travel for the Student with Deafblindness

Due to the complexity of needs of students who are deafblind continuous input from a core group is often needed to guide daily programming. The function of the core team is to review, refine, and direct on-going educational programming and may include those who daily and weekly interact with the student (e.g. parent, intervener, classroom teacher, teacher of students with deafblindness, teacher of students with visual impairments). The core team should meet regularly (weekly, bi-weekly, monthly or quarterly) based on the student's needs. An extended team may meet with the core team when expertise is needed in specialized therapy areas (e.g. PT, OT, O&M).

(Listed alphabetically, not in order of importance)

Audiologist:

- Providing training with personal amplification device of the student to Teacher of Deaf and the Hard of Hearing (TDHH)
- Provide audiological evaluation and results of evaluation to Educational Team
- Collaborate with Orientation and Mobility Specialist (COMS), Teacher of Deaf and the Hard of Hearing (TDHH), Family, and other Educational Team Members
- Selecting and programming appropriate personal amplification device and FM System/Classroom Amplification Device
- Verification of proper working order of personal amplification device and FM System/Classroom Amplification Device
- Providing training with personal amplification device of the student to other members of the Educational Team
- Maintaining the personal amplification device to the extent necessary as the student develops independence

Certified Orientation and Mobility Specialist (COMS):

- Evaluate and instruct in use of audition for environmental sounds in functional setting
- Communicate specific uses of environmental sounds to Audiologist, TDHH, and other members of Educational Team
- Receive training on student's use of their personal amplification device from Teacher of the Deaf and Hard of Hearing (TDHH)
- Write goals and objectives related to safe and independent travel skills
- Provide written recommendations for adaptations related to safe and independent travel

- Request attendance at the audiological evaluation if permitted

Intervener:

- Act as a communication bridge for the Orientation and Mobility Specialist and the student
- Provide input to the team on the student's preferences, dislikes, behaviors and orientation and mobility needs
- Work with the student, family, and entire educational team to develop IEP goals and objectives
- Reinforce orientation and mobility skills and concepts through activities and routines.
- Promote the student's independence to ensure their needs (including safety) are met

Families:

- Complete assessment inventories that contributed to evaluation data
- Working with the student on developing maintenance skills for the personal amplification device and FM System/Classroom Amplification Device
- Practice skills introduced during instruction with TDHH and COMS
- Provide information regarding student's use of audition and ability to access environmental sounds in varied environments, positive aspects as well as challenges observed and expressed

Teacher of Deaf and the Hard of Hearing (TDHH):

- Support the COMS and the audiologist's collaboration to insure that the student's personal amplification device includes programs to access environmental sounds targeted in the O&M evaluation.
- Provides the Certified Orientation and Mobility Specialist with training and practice in the use and maintenance of the student's personal amplification device.
- TDHH actively works with the COMS
 - To assess the child's current ability to detect, discriminate and utilize the environmental sounds targeted for Orientation and Mobility skill development.
 - To write accommodations and strategies for the IEP to support the use of environmental sounds in Orientation and Mobility activities across all settings for developing independence in the school, home, and community
 - To write IEP objectives for auditory training for the sounds targeted in the Orientation and Mobility evaluation

- Involve parents and other team members in implementing strategies for developing skills and concepts identified in goals and objectives related to environmental sounds and purposeful movement/independent travel

Teacher of Students with Deafblindness (TDB):

- Educate Team on deafblindness and building auditory skills
- Does not replace Teacher of the Deaf and Hard of Hearing (TDHH), unless they are dual certified as Teacher of the Deaf and Hard of Hearing (TDHH) and Teacher of Students with Visually Impairments (TVI)
- Provide information regarding the impact of the child's etiology on learning style and behavior
- Evaluate the impact of the child's vision loss and hearing loss on the acquisition and use of preferred mode of communication
- Participates in all IEP or IFSP meetings to insure appropriate programming and services specific to deafblindness
- Participates in developing Behavior Intervention Plans
- Provide the families with information regarding services for students with deafblindness from state agencies
- Supports the intervener

Teacher of Students with Visually Impairments (TVI)

- Educate Team on impact of visual impairment on and developing visual skills for students with remaining vision
- Does not replace Teacher of the Deaf and Hard of Hearing (TDHH), unless they are dual certified as Teacher of the Deaf and Hard of Hearing (TDHH) and Teacher of Students with Visually Impairments (TVI)
- Evaluate the impact of the child's vision loss on the acquisition and use of preferred mode of communication and learning media

Environmental Sound Considerations for the Audiologist and the Orientation and Mobility Specialist

Discrimination, making distinctions between sounds that allow one to categorize and recognize what a sound is or is attributed to

- **Audiologist Considerations:**
This will likely require less compression of sound in order to discern differences sounds like idling and accelerating cars or comparing echo sounds in a quiet environment.
- **Orientation and Mobility Specialist Considerations:**
When hearing aids are used all sounds get louder and often there is a peak level at which loud sounds are cut off to prevent really loud sounds being relayed to the wearer. Often these sounds are needed to discern something like a city bus from a car.

Identification, identifying the presence or absence of sound in the environment

- **Audiologist Considerations:**
When noise is removed from an environment in order to optimize the ability to attend to speech, much of the environmental components in the sonic landscape that student with deaf blindness uses to relate to their surroundings also disappear. Considering “noise as information” (from Lisa Sutherland) can be very helpful when deciding what to retain for the user.
- **Orientation and Mobility Considerations:**
Because hearing amplification changes some sound qualities, the ability identify sounds can be changed when a student uses an assistive listening device. Many times, hearing aids are set to optimize a student’s ability to attend to speech or even speech through a specific source (e.g. an FM System) by eliminating other surrounding sounds. These are typically the sounds a student would use to relate to their environment while traveling or exercising purposeful movement.

Localization, determining the location and direction of a sound source in the environment

- **Audiologist Considerations:**
With the elimination or compression of the sound scape the ability to determine where a sound is located and to decipher information about its trajectory can be very challenging. Having bilateral assistance or equalization of intensity to both right and left inputs will allow for great accuracy in auditory perception of the environment.
- **Orientation and Mobility Considerations:**
Just as stereoscopic vision is requisite for effective depth perception, having a disparity in hearing between the two sides can making accurately localizing sound very difficult. Determining the presence of an approaching vehicle, locating a dropped object, turning toward a sound source, etc. are all affected.

Auditory Landmark, Cues, and Clues:

Landmarks are persistent, consistent, and unique; examples might include sound of a public fountain that runs 24 hours a day and helps an individual to know where they are, or the waves at the shoreline.

Cues are sounds that are not “always” present but give information about where one is. Examples might include the sound of the automatic door at the entrance to the grocery store; it only occurs when you are approaching the door and cues you to the transition from indoor to outdoor, or the sound the elevator makes as it arrives at the level one is standing and often has a unique characteristic for the direction of the car, such as one chime for ascending and two chimes for descending.

Clues are sound features that help one to deduce information about their environment, such as hearing a keyboard or telephone and guessing that you are near a reception desk.

Echolocation:

The use of reflected sound to determine the presence and characteristics of features of the environment. This could be hearing a tree (by way of a subtle change in echoes) as one is walking along a sidewalk, or hearing an open corridor in a building to know when to initiate a turn. Passive Echolocation is using changes ambient sound for information about the environment and Active Echolocation is generating a purposeful noise to be reflected off of the environment. Purposeful noises could be a sharp tongue click (very effective as the sound returns to the area it was emitted from, specifically the mouth being relatively proximal to the ears), or the tap of the cane tip on the ground. Often young children will use loud vocalizations, hand claps, or foot stomps on the ground to generate echoes. They may not be consciously aware or able to describe what they are doing but have a functional gain in their ability to orient in their environment by doing so.

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Collaboration Tool for Environmental Sounds

The following provides a series of items as a guideline for the collaborative efforts of the Audiologist, Teacher of Deaf and the Hard of Hearing, and the Orientation and Mobility Specialist. Possible interventions or implications are likely found in the following areas:

Mic directionality, Noise reduction/suppression, Ear mold venting, Compression, Binaural amplification, Multiple programs, and Potential use of FM+M setting. Note, a hearing aid does not have to do all of these things all of the time.

<p align="center">Landmarking, Cues, and Clues (*Note, by definition “landmarks” need to be constant/continuous sounds and therefore may be considered “noise” by amplification)</p>	<p align="center">Notes on Student Needs or Concerns</p>
<p>Using sounds from the environment for maintaining orientation (e.g. compressor on the drinking fountain, vending machines, dishwasher, fans, etc.)</p>	
<p>Using sounds for clues about the purpose of a public area in commercial setting (e.g. children’s music played in the book store near the children’s section, instrument sounds from the band room, etc.)</p>	
<p>Using sounds to circumnavigate something (e.g. walking around a fountain in the center of a park)</p>	
<p>Monitoring activity sounds indoors in home setting (e.g. from the kitchen area, water running at the sink, flushing toilet, typing on keyboard in the office, parent preparing dinner)</p>	
<p>Monitoring activity sounds indoors in commercial settings (e.g. scanner at checkout lines at grocery stores to determine the location of the front of the store and proximity to exits, automatic doors at front of store, cashier at front of Starbucks)</p>	

Echolocation	Notes on Student Needs or Concerns
Using echoes and reflected sound for size of space (passive echolocation would use ambient sound and active echolocation would use a self-generated sounds like tongue clicks or cane taps) for determining size of space, such as using sound to determine a big room (e.g. auditorium, gymnasium, or cafeteria) from a smaller room.	<i>Draft 10-2015</i>
Using echoes and reflected sound for orientation and navigation (e.g. using passive echolocation to determine open hallways for turning en route to a classroom, using active echolocation to determine the location of a building across a parking lot).	

Traffic Considerations for Safety in the Community	Notes on Student Needs or Concerns
Estimating distance of sound source, fixed source or from moving source	
Using the sound emitted from of a lane of traffic that is next to the student who is deafblind as they cross the street to make sure their crossing is straight (this is an alignment from the side rather than front to back)	
Using sound that emitted from in front or behind as orientation while walking. (e.g. using the beeping accessible pedestrian signal as a target for their destination)	
Recognizing sound masking and the dangers that may present by missing an important environmental component (e.g. sound of a plane overpowering the sound of a hybrid car)	
Identifying patterns in sounds, (e.g. cars turning at an intersection in various directions)	
Distinguishing sources of sounds (e.g. lawnmower, airplane, etc.)	
Recognizing sound shadows (e.g. large parked vehicle that blocks the sound of traffic)	

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Determining distance and direction of sound in traffic settings from all directions simultaneously if possible (e.g. to determine whether an emergency vehicle is approaching or going away from one's self, to determine the proximity and direction of perpendicular traffic or right hand turning cars before stepping into the crosswalk, monitoring for approaching or departing trains at a station platform)	
Analyzing distant traffic sounds in residential areas (e.g. detecting cross streets to keep path straight and toward destination, and awareness of impending street crossings)	

Other Skills	Notes on Student Needs or Concerns
Localizing sounds (e.g. being able to walk to a sound source, for use in retrieving a dropped object)	
Monitoring activity sounds outdoors for safety and general awareness of environment (e.g. keeping track of nearby space to be aware of individuals walking up from behind or those approaching from the front)	
Understanding when one's own ability to use sound is impacted by changes within the environment, or within one's self (for example adverse weather conditions, battery dying in an assistive device, choosing the correct amplification program).	

Sounds that may remain inaudible even with the use of amplification:

Handout produced and made accessible by
Texas School for the Blind & Visually Impaired
Outreach Programs



Figure 1 TSBVI logo.



"This project is supported by the U.S. Department of Education, Office of Special Education Programs (OSEP). Opinions expressed herein are those of the authors and do not necessarily represent the position of the U.S. Department of Education."

Figure 2 IDEAs that Work logo and OSEP disclaimer.