

WDE ACCOUNTABILITY

Hearing Screening Components Guide Handbook



Wyoming Department of Education

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Introduction

Undiagnosed hearing loss in school students may impact their development of speech, language, social skills, and their ability to perform academically. Regular school screening for hearing conditions is an important part of school health services, carried out by the professional school nurses, speech language pathologists (SLPs), audiologists, and trained school personnel. Screening is intended to facilitate early identification and diagnosis of disease and functional disorders, and to provide students the best opportunity to develop academically, emotionally, and socially. Screening is an easy, relatively inexpensive way to identify, from a large number of apparently healthy students, those who may be at risk of having a potentially disabling condition.

Only a licensed audiologist can diagnose and treat a hearing problem, but screenings help find children who need a full exam and potential interventions. Students with hearing concerns should be referred to an audiologist or healthcare professional. The referral is the most important component of the screening program.

The Individuals with Disabilities Education Act and Section 504 of the Rehabilitation Act of 1973 require educational agencies to identify all students who have a disability that impacts their education. Hearing screening is a critical tool in identifying students who may have a hearing condition. In addition, federal laws require that assessments are conducted to determine students that are eligible and that their unique educational needs are identified and programmed for. Hearing screening procedures can help an educational agency to determine if a student may have a hearing condition that would make assessment materials inaccessible to them and potentially invalidate these assessments. The collection of hearing screening data contributes to the mandatory annual reporting to the Wyoming Department of Education in the School Health Report, to facilitate planning support to Wyoming school districts and students (W.S. 21.2.202(a) (xxxviii)(E) (WDE534)).

This hearing screening guidebook supports the recommendations from the American Speech-Language-Hearing Association (ASHA), American Academy of Audiology (AAA), American Board of Audiology (ABA), American Academy of Pediatrics (AAP), National Association of School Nurses (NASN), and the Wyoming Early Hearing Detection & Intervention (EHDI) Program. The hearing guidebook is intended to guide school nurses, school health representatives, special education professionals, SLPs, audiology teams, and schools in the identification of children who may have a hearing disorder, who then must promptly be referred to a professional for further evaluation and possible treatment.

Importance of Hearing Screening

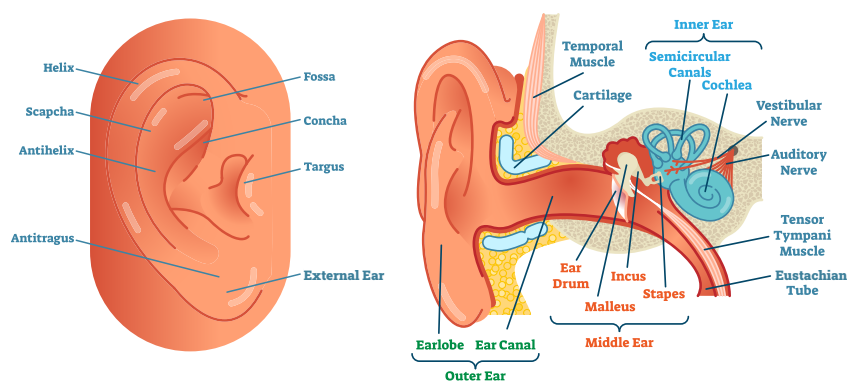
Screening in schools may be the only avenue for some children to receive hearing/ear health care. Screenings play a vital role in not only students' health, but also their educational journey including:

- Early detection of ear conditions that could potentially impact the students' ability to learn or academic performance.
- Repeated hearing screenings throughout a child's school years are most effective in detecting new or previously undiagnosed hearing and ear health problems.
- Ensure that appropriate educational accommodations are provided for students with hearing conditions.

- Hearing screenings of children should be completed by individuals who have completed a training and/or certification program.
- Screenings are accomplished using valid, reliable, and age appropriate tools and methods.
- Establish follow up procedures to ensure that each identified student will receive appropriate hearing and ear health care.
- Facilitate access to a professional provider for all children who fail a hearing screening or for children who are at an increased risk of a hearing problem because of an underlying medical condition.

Hearing Development

The primary purpose of the human ear is to receive sound from the environment, process it, and transmit to the higher brain centers. There are four major areas of the auditory system: the external ear, the middle ear, the inner ear, and the central auditory nervous system.



Childhood Hearing Disorders

Hearing disorders are commonly classified into one of four major categories: conductive, sensorineural, mixed, and non-organic hearing losses.

Conductive Hearing Loss; malfunction of the external and/or middle ear while the inner ear and auditory nerve are normal.

- Reduction in the level of sound being conducted to the inner ear.
- Associated Symptoms
 - Demonstrates either a hearing loss predominantly in the low frequencies or a hearing loss occurring equally across all frequencies.
 - Understands speech well when the loudness of the speaker is increased sufficiently to overcome the amount of the conductive loss.
- Example
 - Atresia; birth defect resulting in possible malformation in the pinna; the pinna and the external ear canal; the pinna, external ear canal and middle ear; or complete, involving the pinna, the external ear canal, middle ear and inner ear.
 - Foreign body or cerumen(wax) build-up.
 - Otitis media; inflammation of the middle ear cavity.
 - Perforated tympanic membrane (ear drum).
 - Ossicular abnormalities; disarticulated, loose, or fixation of the ossicles.

Sensorineural Hearing Loss; malfunction of the inner ear (cochlea) and/or the auditory nerve, in the presence of a normal external and middle ear.

- Reduction in the loudness level of sound and a loss of clarity of speech.
- Associated Symptoms
 - A hearing loss ranging from mild to profound in one or both ears.
 - A reduced ability to understand speech.
 - Possibly poor speech because of the inability to hear others or monitor one's own speech.
- Example
 - Congenital hearing loss (genetic conditions); developed before birth from heredity, traumatic birth, or medications during pregnancy.
 - Acquired hearing loss; from infections, injuries to the head, administration of ototoxic medications, excessive exposure to high intensity noise (older children or young adults).

Mixed Hearing Loss; combination of conductive and sensorineural loss in the same ear.

Non-Organic Hearing Loss; not really a hearing loss at all, rather a willful intent of the child to feign a hearing loss in one or both ears when in fact their hearing is normal.

- Although it is most common for a child to fake or exaggerate a hearing loss, there have been occasions when a child with a legitimate hearing loss attempted to persuade the examiner that his/her hearing was better than it actually was. Audiologists have a number of clever and effective test procedures to measure the malinger's true hearing ability. In regard to screening children, it is infrequent that non-organic hearing loss will occur.

SCREENING COMPONENTS

There are three parts to the hearing screening process:

- Otoscopic Inspection
 - This is the inspection of the ear canal and tympanic membrane (eardrum).
- Pure Tone
 - Uses an audiometer to control the pitch and loudness of pure-tones presented to the student to check hearing acuity.
 - Note: An otoacoustic emission (OAE) hearing screening can be used as an alternative for students who are unable to condition to pure-tone screening. It should not be used as a substitute for pure-tone screening if the student is willing and capable of pure-tone screening.
- Immittance
 - Measures the function and integrity of the middle ear system.

Hearing Screeners

Prior to completing a hearing screening all school personnel that will be screening must have adequate instruction and training. Additional school staff can be helpful for assisting during a hearing screening and may assist with set-up, sanitizing equipment in between uses, recording data, and organizing student flow during the screening process.

For onsite hearing screening training, contact WDE Deaf/Hard of Hearing outreach at 307-274-1391.

Hearing screenings for students may be conducted by:

- Audiologists.
- Audiology aides (under supervision of audiologists).
- SLP.
- Speech language pathologists aides (under the direction of a SLP).
- Registered Nurses (RN).
- Other trained school staff.

Screening Set-Up

Space Requirements

- Quiet area, free from distractions and noise.
- Plug the audiometer into an outlet, making sure it does not cause a tripping hazard.
- Turn the power switch to the “on” position.
- Place the tone switch in the “pulse” position, if available.
- Verify annual calibration of the audiometer.
- Check the audiometer to see if it is working properly. If it is not, do not use it until it has been repaired.
 - While wearing the earphones, the tester (or a person known to have normal hearing) should be able to hear the tones at the screening levels.
 - All levers and controls should operate smoothly and be free of any extraneous noises. With the earphones on, listen for a smooth increase and decrease of the sound.
 - The earphone cords should be free from breaks. To check for breaks in the cords, shake the cord and listen for interruptions in the signal. Do this for each earphone separately.
 - When checked, the signal should switch properly from the right earphone to the left earphone.
 - The earphone cushions must be free of cracks and splits.

Equipment Needed

All equipment **MUST** be calibrated annually to the appropriate current standards by the American National Standards Institute (ANSI).

Otoscopic Inspection equipment:

- Otoscope

Pure-tone equipment:

- Pure-tone equipment shall have a variable intensity attenuator ranging from 0 dB HL to 50 dB HL.
- Pure-tone equipment shall have a binaural headset. Hand-held pure-tone equipment, automatic pure-tone equipment and standardized speech (picture) testing equipment are not approved for use in school hearing screenings.
- Pure-tone equipment shall meet the appropriate current standards by the ANSI.
 - Optional: Otoacoustic emissions (OAE) screening equipment can be used in lieu of a pure-tone screening if a student can not be conditioned to the pure-tone task due to physical, developmental, or behavioral challenges.

Immittance equipment:

- Immittance testing shall be performed utilizing a 226 Hz tone and a constant pump speed of 200 daPa/sec.
- Immittance equipment shall meet the appropriate current standards by ANSI.

Recommended Timeline for Screening

Grade	Screening Components
Kindergarten (or first entry into school district), 1st, 2nd, 3rd, 5th, 7th, 10th Grade	Otoscopic Inspection Pure Tones Immittance

Screening Referral Criteria

Grades: Kindergarten, 1st Grade, 2nd Grade, 3rd Grade, 5th Grade, 7th Grade, & 10 Grade.

Screening Test	Referral Criteria
<p>Otosopic Inspection</p> <p>Normal Findings: Absence of foreign bodies, excess wax, ability to visualize most of the eardrum.</p> <p>Abnormal Findings: Redness, PE tubes*, scarring, perforations, foreign objects, excess wax, drainage.</p>	<p>Referrals based only on otoscopy are rare; use clinical judgment.</p> <p>If a foreign body is observed, referral or medical follow up may be needed prior to the conclusion of the screening.</p> <p>*If PE tubes are visualized follow up with the family to ensure continuity of care.</p>
<p>Pure-Tones</p>	<p>Responds to 2 out of 3 tone presentations per frequency (1000 Hz, 2000 Hz, 4000 Hz)</p> <p>Fail: Anything that does not align with the pass criteria</p> <p>Note: If unable to condition to pure-tones; proceed with optional OAE screening.</p> <p>Automated DPOAE or TEOAE screening units indicate a Pass or Refer result. The Pass/Refer criteria of OAE screening units differ among manufacturers based on normative data and test protocols. Default criteria specific to the equipment should be used.</p>

Screening Test	Referral Criteria
Immittance	Volume Pass: Without Tube 0.5-1.3 cm ³ , With Tube greater than 2.0 cm ³ Fail: Anything that does not align with the pass criteria
	Compliance Pass: Greater than 0.2 mL, ** Note If compliance is 0.1 mL and a peak is observed and an acoustic reflex is present, it is considered a pass Fail: Less than 0.2 mL
	Pressure Pass: Between +100 and -250 daPA Fail: Pressure greater than -250 daPA

SCREENING PROCEDURES

Prior to All Procedures

- Perform hand hygiene prior to procedure and in between students.

Steps to Conduct Otoscopic Inspection

- Explain the inspection process to the student.
- Ear Drum: Look for pearly-gray color. Absence of redness, PE tubes, scarring, perforations, foreign objects, excess wax, drainage.
- The inspection is now complete. Record your results.
- Clean all equipment per manufacturer recommendations.

Rescreen/Referral

Referrals based only on otoscopy are rare; use clinical judgment. Rescreen and/or referral for medical/audiological evaluation may be needed for a student with direct observation of:

- Discharge from a student's ear canal.
- Malformation of the ear.
- Foul odor from the ear.
- Foreign objects.
- Excess wax.
- Scarring.
- Perforations.
- Redness.
- PE tubes.

NOTE: If PE tubes are visualized follow up with the family to ensure continuity of care.

Steps to Conduct Pure-tone

- Explain the Pure-tone process to the student.
- Position the child where they cannot view the audiometer controls during the screening.
- Instruct the child to raise their hand when the tone is heard and to lower the hand when the tone is no longer heard.
- Verify correct placement of the headphones, check that the diaphragm of the earphone is placed directly over the ear canal. The right earphone (red) should be placed over the right ear and the left earphone (blue) over the left ear. Adjust the earphone head piece to fit securely. The student wearing eyeglasses should be instructed to remove the eyeglasses before the screening to ensure a better earphone fit.
- Turn the intensity dial to 50dB HL at 4000 Hz for a practice tone. If the student responds, you are ready to begin the screening. If the student does not respond to any tone/beep presented at testing frequency, repeat tone/beep at the same decibel/same frequency. If still not heard, mark as a refer and move on to the next frequency.
- Present the following tones to the right ear:
 - 4000 Hz @ 20dB HL
 - 2000 Hz @ 20dB HL
 - 1000 Hz @ 20dB HL
- Present the following tones to the left ear:
 - 4000 Hz @ 20dB HL
 - 2000 Hz @ 20dB HL
 - 1000 Hz @ 20dB HL
- The screening test is now completed. Record your results.
- Clean all equipment per manufacturer recommendations.

Rescreen/Referral

Any student who fails on the screening will need to be rescreened on all three components of the screening in 4-6 weeks.

Any student who fails on both the first and second screenings shall be referred out for a complete audiological evaluation.

Passing criteria is when the student responds to 2 out of 3 tone presentations per frequency. Referral is indicated with any results outside of the passing criteria.

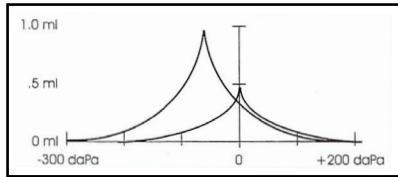
Steps to Conduct Immittance

- Explain the Immittance process to the student.
- Observe both ears before insertion of the probe.
- Place the rubber-tipped probe snugly into the ear canal.
- Immittance testing shall be performed using a 226 Hz tone and a constant pump speed of 200 daPa/sec.
- The test is now completed. Record your results.
- Clean all equipment per manufacturer recommendations.

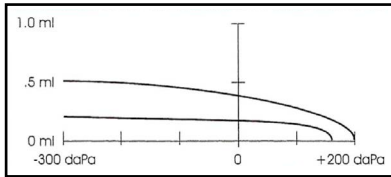
Rescreen/Referral

- Volume
 - Pass: Without Tubes 0.5-1.3 cm³, With Tube greater than 2.0 cm³
 - Fail: Anything that does not align with the pass criteria
- Compliance
 - Pass: Greater than 0.2 mL, ** Note If compliance is 0.1 mL and a peak is observed and an acoustic reflex is present, it is considered a pass
 - Fail: Less than 0.2 mL

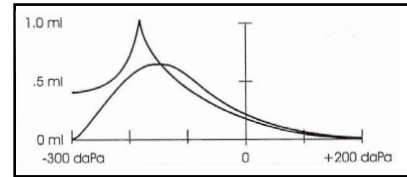
- Pressure
 - Pass: Between +100 and -250 daPA
 - Fail: Pressure outside of +100 and -250 daPA



Normal



Low Compliance (Flat)



Negative MEP

Rescreens, Referrals & Follow Up

Any student who fails on the screening will need to be rescreened on all three components of the screening in 4-6 weeks. Students with hearing concerns should be referred to an audiologist or healthcare professional, depending on which components the student failed. If the screenings indicated a fail for immittance, a referral for medical evaluation should be initiated. If the screening indicated normal immittance results with a failure on pure tones, a referral to an audiologist should be initiated.

The referral is the most important component of the screening program. Hearing screening is of limited value if follow up examinations do not occur or treatment plans are not followed. Educating guardians on the importance of follow up from the hearing referral is the most challenging and critical aspect of the screening process. If the educational agency suspects that a student may have a hearing condition that impacts their educational performance, the district's special education team should be contacted. In these situations, the district may be responsible for facilitating and attaining an exam, as part of a comprehensive evaluation under the IDEA.

Automatic referral

Should a student be unable to condition to testing protocol, an automatic referral to an audiologist will be made. This is assessed on an individual basis in collaboration with the guardian, the student, and the school health screener.

Special Circumstances; Third Screening

A third screening may be needed if follow up has been unsuccessful within 4-6 weeks after the second screening. Additionally, screening should be conducted 4-6 weeks after medical referral to ensure immittance abnormalities have resolved. If a student fails the third screening, a recommended conference should take place including parent/legal guardian, school staff, and screener to discuss educational impacts and follow up recommendations. Documentation should support the information discussed between parent/legal guardian, school staff, and screener.

Hearing Screening Referral

1ST HEARING SCREENING

PASS
Record pass per district protocol.



FAIL

- Record failure per district protocol.
- Any student who fails on the screening will need to be rescreened on all three components of the screening in 4-6 weeks.
- Notify guardians and school staff per district protocol.

2ND HEARING SCREENING

PASS

- Record pass per district protocol.
- Notify guardians and school staff per district protocol.



FAIL

- Record failure per district protocol.
- Notify guardians and school staff per district protocol.
- If the student fails on the immittance component, a referral for medical evaluation should be initiated.
- If a student fails on the pure tone component, a referral to an audiologist should be initiated.

If audiological evaluation results have not been received in 4-6 weeks re-screen

AUTOMATIC REFERRAL

Should a student be unable to condition to testing protocol an automatic referral to an audiologist will be made. This is assessed on an individual basis with collaboration with parents, students, and school health screeners.

SPECIAL CIRCUMSTANCES

Third screening may be needed if follow up has been unsuccessful within 4-6 weeks after the second screening. Additionally, screening should be conducted 4-6 weeks after medical referral to ensure immittance abnormalities have resolved.

Follow Up Practices:

How follow up is conducted is a decision best made locally. Each school or district will need to determine the most efficient and effective method for follow up. Compliance and follow up are more likely to occur if the process is systematic and efficient.

Tips for school nurses, screeners, teachers, or other appropriate staff include:

- Find community providers and send list home.
- Look for funding resources such as medical insurance, medicaid, or organizations/programs that provide funding.
- Giving referral letters to guardians in person (not mailing or sending home in backpack).
- Ensuring all information given to guardians is unbiased, in their native language, and complies with health literacy and cultural competency guidelines.
- Using follow up letters, texts, email, or telephone calls for obtaining documentation of audiological and medial referral results.

Summary

Timely identification and treatment of many hearing disorders can prevent a negative impact on early literacy skills in children. In accordance with the IDEA and Section 504 of the Rehabilitation Act of 1973, educational agencies are required to identify all students who have a disability that impacts their education. Hearing screenings are a first step in identifying hearing disorders in children, followed by the referral process to a healthcare professional or audiologist. School and health personnel should collaborate with families in coordination of any ear care needed and support any treatment recommendations. Collaborative efforts by schools and families will assist in the best possible health and educational outcomes for students.

Appendices

Appendix 1: Definitions & Terms

[Glossary of Terms](#)

Appendix 2: Equipment List

[Hearing Screening Checklist](#)

Appendix 3: Additional Resources for School Staff

For onsite hearing screening training, contact WDE Deaf/Hard of Hearing outreach at 307-274-1391.

[Deaf and Hard of Hearing Services](#)

[Effects of Hearing Loss on Development](#)

[Early Intervention English](#)

[Early Intervention Spanish](#)

[Wyoming ELDI Resources for Professionals](#)

[Best Practice Protocol](#)

[Disposition of Hearing Rescreens](#)

[McGovern Medical School; Ear Disease Photo Book](#)

[AAA: Educational Audiology](#)

[Pure Tones Screening in Schools: Video](#)

[Wyoming EDHI: Online Training](#)

Appendix 4: Pass, Rescreen & Referral

[Hearing Screening Referral Chart](#)

[Pass Letter](#)

[Hearing Rescreening Notification](#)

[Referral with Release of Information](#)

Appendix 5: Parent Information

[Wyoming \(EHLI\) Program Brochure English](#)

[Wyoming \(EHLI\) Program Brochure Spanish](#)

[Wyoming EHLI Resources for Families](#)

Appendix 6: References

[Childhood Hearing Screening Guidelines \(AAA\)](#)

[Hearing Loss Detection in Schools and Early Child Care Settings \(NASN\)](#)

Resources

[American Academy of Audiology \(AAA\)](#)

[American Academy of Pediatrics \(AAP\)](#)

[American Board of Audiology \(ABA\)](#)

[American Speech-Language-Hearing Association \(ASHA\)](#)

[National Institute on Deafness and Other Communication Disorders](#)

[National Association of School Nurses \(NASN\)](#)

[Wyoming Early Hearing Detection & Intervention \(EHLI\)](#)