



Guidelines: A School Hearing Screening Program

Screening and Special Services
Oklahoma State Department of Health
1000 NE 10th Street
Oklahoma City, OK 73117-1299
405-271-6617
July 1994
(rev: 07/12)

Preface

The revision of this document was completed by the Oklahoma State Department of Health (OSDH), Screening and Special Services, Newborn Hearing Screening Program in conjunction with the Oklahoma Audiology Taskforce (OKAT) in 2012.

Contributors

A special thank you goes to the OKAT Protocols Subcommittee for disseminating the statewide survey and creating this document. Members include:

Christi Barbee, Au.D, CCC-A, F-AAA, Clinical Assistant Professor, University of Oklahoma Health Sciences Center, College of Allied Health

Patricia Burk, M.S., CCC-SLP, LSLS Cert. AVT, Coordinator, Oklahoma Newborn Hearing Screening Program

Deborah Earley, M.S., CCC-A, Follow-up/Audiology Coordinator, Oklahoma Newborn Hearing Screening Program

Sandra Over, Au.D, CCC-A, Clinical Audiologist Manager, Integris Cochlear Implant Clinic

Mona Ryan, M.S., CCC-SLP, ASHA Fellow, Clinical Assistant Professor, University of Oklahoma Health Sciences Center, College of Allied Health

Robin L. Sanders, M.S., CCC-A, Educational Audiologist, Tulsa Public Schools

Nathan Wells, B.A., 3rd Year Au.D Student, University of Oklahoma Health Sciences Center, College of Allied Health

Table of Contents

Overview	4
Screening Program Development and Management	5
Accountability	5
Program Evaluation	6
Personnel	6
Scheduling	6
Equipment	6
Infection Control	7
Informed Consent	7
Caregiver Notification of Screening	7
Population of Children To Be Screened:	7
Screening Environment:	9
Screening Procedures:	9
Hearing Screening Tools:	9
Conventional Pure Tone Audiometry Screening	10
Listening Check of the Audiometer	10
Preparing the Child for Screening	10
Screening Protocol	11
Screening Sequence	11
Special Considerations for Pure Tone Audiometry	12
Otoacoustic Emissions (OAEs) Screening	13
Tympanometry Screenings	13
Screening Results and Referral Criteria	14
Pure Tone Audiometry	14
Otoacoustic Emissions:	14
Tympanometry:	14
Further Recommendations	14
Caregiver Notification of Results	15
Record Keeping	15

Appendix.....	16
Appendix A: Risk Factors associated with Childhood Hearing Loss	16
Appendix B: Infection Control and Universal Precautions	17
Appendix C: Parent Letters	18
Letter: Caregiver Notification of Hearing Screening.....	19
Letter: Passed Hearing Screening.....	20
Letter: Referral for Further Hearing Testing.....	21
Appendix D: Conventional Pure Tone Audiometry- Components.....	22
Appendix E: Otoacoustic - Components.....	23
Appendix E: Tympanometry – Components.....	23
Appendix F: Individual Hearing Screening Form	24
Appendix G: Classroom Roster Form.....	25

A SCHOOL HEARING SCREENING PROGRAM

Overview

Childhood hearing loss has a devastating impact on development of speech and language skills. Hearing loss can adversely affect the developing auditory nervous system and can have harmful effects on social, emotional, cognitive, and academic development, and subsequently, on the individual's vocational and economic potential.

The incidence of **hearing loss** in the newborn population is estimated to range from 1-3 per 1,000 live births. The prevalence rises in older infants and toddlers if mild conductive hearing losses associated with otitis media with effusion are included in these estimates. The incidence of **unilateral hearing loss** in newborns range from .8-2.7 per 1,000 and in school aged children from 30-56 per 1,000 (Bess et al., 1998, Niskar et al., 1998) Children with unilateral hearing loss need to be identified as early as possible as research findings have now shown that approximately **one-third** of children with permanent unilateral loss experience significant language and academic delays. It is important to be aware of the risk indicators associated with permanent congenital, delayed-onset or progressive hearing loss in childhood. It is estimated that 4,000-6,000 children that pass the initial newborn hearing screening will subsequently develop a significant hearing loss. ([Appendix A](#))

The need for early identification of hearing loss along with appropriate follow-up treatment and/or habilitation is of utmost importance. To identify children with hearing loss that may hinder their ability to communicate, a systematic program for screening all children at certain ages and grades and for screening at-risk children must be implemented. A hearing screening program to accomplish this task is found on the following pages. It identifies the personnel needed to operate the program, lists a recommended screening schedule and describes the screening equipment, screening environment and screening techniques. The program discusses hearing screening results and lists referral criteria. Lastly, screening record keeping is discussed. Examples of suggested letters and forms are found in the appendix.

It is important to remember that a hearing screening is a screening only and not a complete assessment of hearing sensitivity. Not passing a screening does not necessarily indicate a hearing loss but rather is an indication of the need for an in-depth audiologic evaluation as soon as possible. Further, because of the limited scope of a screening, certain audiologic or otologic problems cannot be ruled out even if the screening is passed.

Screening Program Development and Management

The American Speech-Language-Hearing Association (ASHA, 1997). *Guidelines for Audiologic Screening* and the American Academy of Audiology (AAA, 2011) *Childhood Hearing Screening Guidelines* recommend that important program considerations be taken into account to include professional accountability and liability, risk management and quality improvement, and program evaluation.

It is recognized by ASHA and AAA that most school districts do not employ nor are contracted with an audiologist. Typically the school hearing screening programs are managed by a non-audiologist who is typically a school health professional. Therefore, it is strongly recommended that the managers of the school hearing screening programs utilize the district educational audiologist or a representative audiologist from their communities as an advisory body for hearing screening programs. This collaboration ensures that appropriate mechanisms are in place for the technical details of the equipment, providing training, and developing protocols.

Accountability

Hearing screening programs must target the following areas for program management responsibilities:

- Accountability
- Risk management
- Program evaluation

The educational audiologist or designated program manager is accountable for:

- Developing the hearing screening program
- Supervising the hearing screening program
- Implementing the hearing screening program

Program management responsibilities include implementing a protocol to ensure

- Patient confidentiality
- Parental notification
- Parental consent when required
- Appropriate referral
- Counseling

It is strongly recommended that a single-school based staff member be designated for tracking referrals that arise from each school.

Quality assurance activities need to be ongoing to include on-site supervision, written documentation, and review on an annual basis. It is recommended that the program manager collaborate with the educational or community audiologist with regards to the following risk factors:

- Potential for infection
- Invalid screening results
- Errors in patient referral and follow-up

Program Evaluation

The program manager must develop mechanisms:

- To quantify the pass/refer rates
- To estimate the sensitivity and specificity of the screening
- To assure effectiveness of follow-up protocols for children needing rescreening

Personnel

Screening practitioners should be limited to:

1. Educational audiologist licensed in the State of Oklahoma
2. Audiologists licensed in the State of Oklahoma
3. Speech-language pathologists with Certificate of Clinical Competence (CCC-SLP) from the American Speech-Language-Hearing Association (ASHA) and licensed in the state of Oklahoma
4. School health professionals and other support personnel that have received hearing screening training by a licensed audiologist or speech-language pathologist

NOTE: To locate a licensed professional in these areas please contact the Oklahoma Board of Examiners for Speech-Language Pathology and Audiology <http://www.ok.gov/obespa/>

Scheduling

Scheduling hearing screenings must be a collaborative process between program managers, persons completing the screenings, volunteer assistants, and the school personnel (i.e. principal, school nurse, and teacher). Factors to be considered:

- Number of students and grades to be screened
- Grade-level or school-wide assessment time periods
- Scheduled vacation days
- Availability of support personnel and volunteers
- Weather-related factors
- Adequate time for follow-up screenings and evaluations
- In-service time for training personnel

Equipment

- Needs to be working properly on day of screening
- Back-up plan is necessary for loaner equipment
- All equipment should be calibrated at least annually
- Screeners should be trained to perform daily listening checks (See Page 10)
- Screeners should look for excessive referrals during the screening day and check equipment at any time
- Most manufacturers or local representatives offer annual calibration and repair contracts

NOTE: If hearing equipment is not available in the school district, please contact the Oklahoma State Department of Health (OSDH) Newborn Hearing Screening Program at 1-800-766-2223.

Infection Control

- Surfaces such as headphones and conditioned-play objects used during screening should be cleaned and disinfected with a wipe or spray before each use
- Probe tips used for tympanometry or OAE screening should either be disposable or cleaned/sterilized before each use
- Check for a lice outbreak in the population of students being screened. If so, modification of screening schedule is recommended
- Have gloves available for screeners

NOTE: Persons responsible for developing, implementing, and monitoring strategies and techniques for infection control should be identified. ([Appendix B](#))

Informed Consent

The ASHA and AAA guidelines recommend obtaining informed parental/legal guardian consent; however, state statutes or regulations, or institutional policies, supersede this recommendation. Protocols should be developed that ensure patient confidentiality. The consent of the patient/legal guardian is the basic legal requisite necessary for disclosure of screening results to third parties (e.g., treatment programs or other professionals or agencies). The infant's or child's name should not be released without written consent of the parent(s) or guardian, the child's consent when he or she reaches the age of majority, or a court order.

Caregiver Notification of Screening

A caregiver must receive written notification that hearing screening will be provided for his child. An example of a suggested letter is provided ([Appendix C](#)). If the caregiver does not want his child to be screened, he must so inform the school

Population of Children To Be Screened:

There is no single federal mandate for childhood hearing screening, however, the goal to identify children most likely to have a hearing loss that may interfere with communication and affect academic performance and success is supported by current federal legislation. The Individuals with Disabilities Education Act (IDEA) 2004 requires school districts to identify, locate, and evaluate all children with disabilities [20 U.S.C. §1412(a) (3)], and it further requires states to have a comprehensive child find system that ensures standards for appropriately identifying infants and toddlers with disabilities that will reduce the need for future services [20 U.S.C. §1435 (a) (5)].

Head Start Performance Standards do specify that a hearing screening be conducted within the first 45 days of enrollment. The Head Start standards for training, qualifying and conducting home visits (Public Law No: 110-134) has a requirement to offer annual hearing screenings for children from birth to entry into kindergarten when needed. Finally, the U.S. Department of Health and Human Services (2005) suggested that there is a need to identify and reduce the proportion of adolescents who have elevated hearing thresholds in the high frequencies in both ears, signifying noise-induced hearing loss.

The response to intervention (RtI) process was designed to increase supports under the No Child Left Behind (NCLB) Act 2001 for students with specific learning and behavior disabilities to prevent academic failure for these students through intervention within general education. It is imperative that the education system rule out the presence of hearing loss in any student who is in the RtI referral process. The RtI calls for information and

data gathering, evidence-based academic and behavioral strategies to be put into place, and ongoing monitoring of the strategy effectiveness.

The following three groups are typically targeted for school-aged screening:

1. All students in specific grades

- Students three years of age through grade three should be screened annually

* Special Note: School districts should choose to identify students with hearing loss and/ or Otitis Media with Effusion (OME) as early as possible and should target preschool and early elementary grade levels for mass screenings due to the high prevalence of OME in young children.

- Children in grade four and above should be screened minimally at three year intervals (Grades 6, 9, and 12)

* Special Note: Higher elementary grades may be selected to identify late onset hearing loss. Secondary students are more at risk for noise-induced hearing loss and should be educated about the risk of noise on hearing and/or selected for screening.

2. Referral students

- Any student in the RtI or special education eligibility process
- Any student being referred for psycho-educational evaluation
- Any student being referred for a speech-language evaluation
- Any student who missed the hearing screening

*Special Note: It is important to rule out hearing loss as an underlying cause or contributing factor for educational difficulties.

3. New students

- Students transferring from another system
- Students who have not been enrolled in school previously

*Special Note: It should not be assumed that a child has had a hearing screening even if the child is transferring with an IEP. Many students transfer frequently; therefore, miss opportunities to participate in required mass screenings and should be included in a new student referral group as part of their enrollment process.

4. Other “at risk” categories

- Recurrent Otitis Media with Effusion (OME) (2 episodes of ear infections within 6 months or 1 episode lasting longer than 4 weeks)
- History of frequent colds, adenoiditis, tonsillitis, or allergies
- Cleft lip/and or palate
- Down Syndrome
- Suspected hearing loss
- Speech/language problems or obvious communication difficulties
- Difficulty following oral directions
- Inconsistent inattentive auditory behaviors
- Ear pain, ear fullness, dizziness, and/or ringing
- Repeating a grade

- Failing a hearing screening during the previous year
- Participating in activities associated with noise exposure (i.e. woodworking, auto mechanics, agriculture, band etc)

*Special Note: Students with documented hearing loss should not be screened and immediately referred to an audiologist for assessment and ongoing monitoring, preferably annually. It is critical that the school collaborate with child's personal audiologist and/or the school district's educational audiologist for any recommendations and modifications.

Screening Environment:

The choice of the hearing screening environment is very important.

- The area **must** be reasonably quiet. The screening site should be selected during school hours so that noise problems can be identified. The site should be away from stairs, windows, street noise, hall traffic, cafeterias, gyms, heating/cooling vents and equipment, bathrooms, play areas and machine rooms, etc.
- Sound treated areas may be available in school libraries or band/music rooms. These areas should be utilized when available.
- Each screening room should accommodate a 3' x 4' table, have at least two chairs and have an electrical outlet.
- The screening environment should have limited visual distractions (i.e. windows, bulletin boards, etc.).
- Ideally, there will only be one screener per room.

Noise levels in the test environment **must** be checked prior to any hearing screening procedure. The person performing the check should have normal hearing sensitivity. The noise level check is accomplished easily with the audiometer. Wearing the audiometer earphones, the screening frequency pure tones (1000 Hz, 2000 Hz and 4000 Hz) should be heard at a level of 10 dB (screening level for children is 20 dB and for adults is 25 dB). If the tones cannot be heard at 10 dB at each screening frequency, do not screen in that environment.

***Special Note: If an appropriately quiet test environment cannot be found, the screening procedure should not be implemented. If noise levels become too high during screening, testing should be discontinued. Do not increase tone levels to compensate for background noise.**

Screening Procedures:

*Special Notes: Always check equipment first before using it. NEVER USE EQUIPMENT THAT IS NOT FUNCTIONING PROPERLY

Before any screening, always make certain the child does not have draining or bloody ears. If this is observed, **do not** screen the child. A medical referral is indicated if the child is not already receiving treatment.

Hearing Screening Tools:

There are three types of devices that can be used for school hearing screenings:

- Conventional Pure Tone Audiometer
- Otoacoustic Emissions (OAE) device
- Tympanometer

*Special Note: Hearing Screening equipment are expensive and complex instruments. The equipment may be damaged by excessive temperatures, by rough handling or by being dropped. **All equipment must be serviced and calibrated yearly.** Calibration dates can be found on the instrument or the case. **DO NOT SCREEN HEARING USING ANY EQUIPMENT WITH AN EXPIRED CALIBRATION DATE.**

Conventional Pure Tone Audiometry Screening

- A. Description: Electronic device capable of generating discrete tones of varying frequency (pitch) and intensity (loudness)
- B. Age Ranges: Children whose developmental age is three years or above
- C. Components: [Appendix D](#).
- D. Procedures

Listening Check of the Audiometer

Prior to providing hearing screenings, a listening check of the audiometer should be performed by the examiner. The recommended procedure is as follows:

- Plug in the audiometer. Turn the power "on" and leave the unit "on" for the day.
- Examine the earphones. Check the cushions for cracks or splits.
- Examine the earphone cords for breaks. Gently untwist the cords if they are tangled.
- Examine the audiometer controls and be certain that all are functioning.
- Perform a listening check while wearing the earphones:
 - a. Set level at 50 dB, frequency selector to 1000 Hz, output selector to right ear and press tone presentation switch. Tone should be clear with no extra noise present. Check other screening frequencies in a similar manner. Repeat for left ear.
 - b. Set frequency selector to 1000 Hz and output selector to right ear. While pressing the tone presentation control, slowly rotate the dial from 0 dB to 50 dB. Listen for abrupt increases in loudness or "dead spots". If either of these conditions is present, the instrument must be serviced before further use.
 - c. Set level at 0 dB. Press and release tone presentation control. No audible click should be heard upon depressing and/or releasing this switch.

Preparing the Child for Screening

Preparation of the child for his/her hearing screening is **EXTREMELY IMPORTANT**. Simple instructions should be given to the child face-to-face and prior to placing the earphones on him/her. Stress the importance of responding quickly to the tone even if it is very faint.

- a. For older children or adolescents, standard instructions can be as follows:
 - "You are going to hear some sounds (beeps, whistles, bells, etc.). Every time you hear one, raise your hand or say 'yes.' Raise your hand as soon as you hear the sound, even if it is very soft. Do you understand?"
- b. Instructions often must be modified for younger children and individuals with any developmental delay. Pantomime, where the examiner illustrates listening, then hearing the sound and finally responding as directed may help train the individual to the task. To be a successful screener, the words you choose to describe what is going to happen as well as the tone of your voice plays a big part in eliciting cooperation.

For younger children, standard instructions can be as follows:

- "Let's play a listening game. I'm going to put this on your ear so you can hear the birdie!" This directive approach can be more reassuring to a child than a question. If you feel the child needs to see and touch the earphone prior to placement, you may let the child feel this while commenting "These are like an airplane pilot's hat" or "It's very soft-like a little pillow."

- For very young children; however, it is sometimes better not to draw attention to the equipment by saying anything about it at all. Instead, help maintain focus on something they enjoy. The last thing you want to do is divert attention to the sensation of the equipment being placed on them.
 - Hand raising or verbal response cannot always be elicited from the younger population. When this happens, a "play" technique is implemented. If a play technique is necessary, it is important to consider a child's motor needs and select toys that are easy enough for the child to manipulate so he/she can do the "listen and drop" task without frustration.
 - THE SIMPLER THE TOYS THE BETTER!!!
 - Blocks and buckets
 - Peg boards - choose ones with large pegs for easy manipulation
 - Use simple toys that are easily sanitized
- c. Demonstration of the procedure can be presented to a group of children who have been brought to the screening area. Using the audiometer, set the frequency selector to 2000 Hz, the attenuator to 90 dB and the output selector to the right earphone. Having gained the group's attention, turn the right earphone toward the children and present the tone. Tell them:

For groups, standard instructions can be as follows:

- "This is what you are to listen for. Each time you hear the whistle, raise your hand. Put your hand down when it stops! Later when you wear the earphone, the whistles will be tiny little ones. Let's practice."
- Present the tone several more times until the group responds as requested. The tone's intensity may be reduced or the frequency changed if more demonstration appears to be needed.

Screening Protocol

The recommended hearing screening procedure that follows is based on the American-Speech-Language-Hearing Association guidelines for Conventional Pure Tone Audiometry.

- Screen at three frequencies: 1000 Hz, 2000 Hz and 4000 Hz.
- The intensity level used for screening is 20 dB (25 dB for age 18 and above).
- Each tone should be presented for duration of 1 to 3 seconds.
- Three presentations of each frequency should be given per ear
- A "Pass" constitutes a response to 2 out of 3 presentations.
- A "Refer" is a lack of response at any single frequency in either ear.
- Results are recorded on a "[Hearing Screening Form](#)." The screening form is marked appropriately using "+" for a response and "-" for no response. Not responding at the recommended screening level at any frequency in either ear shall constitute a "does not pass or refer."

Screening Sequence

- Seeing the child's eyes and facial expressions is helpful in determining the accuracy of responses. However, it is important that the child not see the tester's hands, the audiometer, or the screening record form.
- After giving instructions, the earphones should be placed on the child by the individual who is performing the screening. The **red earphone** covers the **right ear** and the **blue earphone** covers the **left ear**.
- The earphones should be placed over bare ears (remove glasses, earrings or move hair out of way). The earphone headband should be adjusted so that each earphone fits snugly against the ear.

1. Start Screening with the right ear (if the child reports greater hearing problems in right ear, begin with left ear)
2. Present 1000 Hz at 40dB.
 - a. If there is a no response, re-instruct.
 - b. If the child continues not responding, rescreen at a later time. If again he/she does not respond, he/she is considered to have not passed the screening. Mark the screening form appropriately.
 - c. If there is a response, proceed as described below
3. Move dial to 20 dB (25dB for age 18 years and above).
 - a. Present tone three times at this level noting child's response or lack of such. Two responses out of three is considered a pass.
 - b. Mark the screening form appropriately for the right(left) ear at 1000Hz. **“+” for pass or “-” for does not pass.**
4. Change frequency selector to 2000 Hz and present tone at 20 dB (25 dB). Follow procedure used for 1000 Hz and record results.
5. Change frequency selector to 4000 Hz and again present tone at 20dB (25 dB) as described above. Record results.
6. Switch audiometer's output to left (right) ear and then repeat steps 3 through 5. Be certain to record results using **“+” for pass and “-” for does not pass.**

Special Considerations for Pure Tone Audiometry

- Avoid exaggerated, noisy depression of the tone presentation switch; the child may see or hear this and respond to the movement or sound rather than the tone. A minimum of pressure and movement is required to operate the switch.
- Avoid establishing a rhythm of tone presentation. Vary the length of the tones and the interval between tones.
- Avoid looking down at the audiometer and then up at the child every time a tone is presented.
- Do not ask the child during the screening, “Did you hear it?”
- Expect the child to respond to the tone with the specified response (i.e. raise hand, drop block). Be very cautious about accepting changes in facial expression or “smiles” as responses to the tones. Re-instruct the child as to the required response. If the lack of reliable responses persists, discontinue screening. If this is the child's first screening, schedule him for a rescreening. If this is the child's second screening, refer him to an audiologist for assessment.
- Do not allow the child to chew gum during the screening.

1. Results

- Following completion of the screening, results must be evaluated on a **“pass” or “does not pass”** basis. This decision must be based on systematic standardized criterion.
- Not responding at the recommended screening level at any frequency in either ear shall constitute a **“does not pass” or “refer.”**

Otoacoustic Emissions (OAEs) Screening

- Description: Automatic devices; OAEs are sounds generated by a normal functioning cochlea in response to external acoustic stimulation. This is not a test of hearing sensitivity; it is only a measure of outer hair cell function on cochlea
- Age Ranges: Recommended for preschool and school age children that cannot perform the Pure Tone screening (typically <3 years of age)
- Components: [Appendix E](#)
- Procedures:
 - Before beginning screenings, ensure that the environment is quiet and child is very still. Results may be compromised if the child is active.
 - Note size and shape of the child's ear canal opening.
 - Select an ear tip or cuff of a size that will fit snug in the ear canal.
 - Gently place probe in ear canal.
 - Do not hold probe in ear canal as that increases potential for high noise level.
 - Press test. The display will read "Pass" or "Refer" when the screening is complete.
 - Repeat above procedures for the other ear.
 - Record appropriately on form.
 - Children referring on OAEs should be screened with Tympanometry

Tympanometry Screenings

- Description: Automatic devices; Tympanometry assess the status of the middle ear system by varying air pressure from positive to negative in the ear canal.
- Age Ranges: Recommended for ages six months and older
- Components: [Appendix E](#)
- Procedures:
 - Note size and shape of the child's ear canal opening.
 - Select an ear tip or cuff of a size that will seal the ear canal.
 - Gently place the probe tip against the outer ear canal sealing the ear canal
 - Pull up and back on the pinna to straighten the ear canal
 - Observe the tympanometer's signaling system regarding operating status. All brands indicate whether a seal has been obtained and whether testing is proceeding. Some devices use a series of lights; others use visual displays and or/auditory signals.
 - When seal is obtained, the machine will automatically proceed with the screening. This will take about 3-5 seconds.
 - If the device indicates that a seal was not obtained, remove the probe/ear tip and try again.
 - When test is complete, remove probe tip from canal entrance.
 - Repeat above procedure for the other ear
 - Record appropriately on form
 - If printer capabilities are available, adhere printout to form

*Special Note: Remember tympanometry should not be used as a screening tool alone as it is not a measure of hearing sensitivity. It is a measurement of the status of the middle ear system. It can be used as a second-stage screening tool or to complement the Pure Tone screening or the OAE screening.

Screening Results and Referral Criteria

Following completion of the screening, results must be evaluated on a “pass” or “does not pass” basis. This decision must be based on systematic standardized criterion.

Pure Tone Audiometry:

- Not responding at the recommended screening level at any frequency in either ear shall constitute a “does not pass” or “refer.”

Otoacoustic Emissions:

- “Refer” on either ear

Tympanometry:

Pass

- Ear canal volume of 0.2 mmho through 1.8 mmho
- Admittance peak of 0.3 mmho through 1.8 mmho
- Pressure peak of +100 daPa through -190 daPa
- Gradient: ≤ 200 daPa
- Pass hearing screening

Refer

- Ear canal volume of < than .2 mmho
- Ear canal volume >1.8mmho and no history of tubes
- Admittance peak <.3mmho and refers Pure Tone Audiometry

Rescreen 4-6 weeks

- All conditions present that are not specifically noted in the PASS or REFER categories.
- Gradient measure of >200 daPa in children.
- These conditions indicate an “at-risk ear”

* Special Note: A negative pressure peak (outside normal range) on three consecutive occasions warrants medical consultation.

Further Recommendations:

Follow-up and referrals are essential to the effectiveness of the Hearing Screening Program. Please utilize the following recommendations on when and to whom to refer:

- Children who “**do not pass**” the hearing screening should be referred to their **primary care provider (PCP)** and an **audiologist**.
 - It is strongly suggested by the American Academy of Audiology (AAA) that screening programs do not rescreen children who refer on pure tone hearing screening and pass tympanometry. A referral should be made for an **audiological evaluation immediately**.
- Hearing screening programs may choose to perform a second-stage screening on children who do not pass one frequency; however children who do not pass two or more pure tone frequencies should be referred for an **audiological evaluation**.
 - If a second-stage screening is performed, it is recommended that it be done within two weeks of initial screening.

- Due to the limited scope of the screening procedure, certain audiologic, otologic, or speech/language disorders may not be ruled out even if the screening is passed.
 - Children displaying obvious symptoms of *ear pathology* (such as ear pain or ear discharge), disequilibrium, or *vertigo* should be referred to the **PCP**.
 - Children passing the hearing screening but observed to have *delayed speech/language development* should be referred to a **speech-language pathologist**.
 - Caregiver/teacher concern about a child's speech/language and/or hearing ability should result in the child being referred to a **speech-language pathologist and/or audiologist**.

Caregiver Notification of Results

Caregivers **must** be informed of the hearing screening results. Notification should be in writing ([Appendix C](#)). Telephone notification may be appropriate provided that written confirmation follows.

In reporting results and keeping records, it is important that appropriate terminology be used such as “**Pass**” or “**Did not Pass/Refer**” (not “**Fail**”). When a child does not pass a screening, the child should be “**referred**” to an audiologist for additional testing. **Because a hearing screening is not a diagnostic test, no statement regarding "hearing loss" should be made.**

Record Keeping

An individual hearing screening form ([Appendix F](#)) should be prepared for each child screened. Minimally it should include enough information to positively identify the child, the screening results, the date of the screening and the name and title of the person performing the screening. Information from this form should be transferred to the child's permanent record, classroom roster, caregiver notification letter and/or other documents.

A roster for each class is recommended and should include: ([Appendix G](#))

- School name
- Classroom teacher, grade, and room number
- List of each child in the class
 - Indicate whether the student was screened or participated in screening
- Results and Date
- Referrals

Appendix

Appendix A: Risk Factors associated with Childhood Hearing Loss

RISK INDICATORS ASSOCIATED WITH PERMANENT CONGENITAL, DELAYED- ONSET, OR PROGRESSIVE HEARING LOSS IN CHILDHOOD

(JCIH Position Statement, 2007)

Risk indicators marked with a * are of greater concern for delayed-onset hearing loss

1. Caregiver concerns* regarding hearing, speech, language, or developmental delay
2. Family history* of permanent childhood hearing loss
3. Neonatal intensive care of more than 5 days or any of the following regardless of length of stay: ECMO,* assisted ventilation, exposure to ototoxic medications (gentamicin and tobramycin) or loop diuretics (Furosemide/Lasix), and hyperbilirubinemia that requires exchange transfusion
4. In utero infections, such as CMV,* herpes, rubella, syphilis, and toxoplasmosis
5. Craniofacial anomalies, including those that involve the pinna, ear canal, ear tags, ear pits, and temporal bone anomalies
6. Physical findings, such as a white forelock, that are associated with a syndrome known to include a sensorineural or permanent conductive hearing loss
7. Syndromes associated with hearing loss or progressive or late-onset hearing loss, *such as neurofibromatosis, osteopetrosis, and Usher syndrome; other frequently identified syndromes include Waardenburg, Alport, Pended, and Jervell and Lange-Nielson
8. Neurodegenerative disorders * such as Hunter syndrome, or sensory motor neuropathies, such as Friedreich ataxia and Charcot-Marie-Tooth Syndrome
9. Culture-positive postnatal infections associated with sensorineural hearing loss,* including confirmed bacterial and viral (especially herpes viruses and varicella) meningitis.
10. Head trauma, especially basal skull/temporal bone fracture* that requires hospitalization

Appendix B: Infection Control and Universal Precautions

When screening hearing, precautions should be taken in controlling contaminants in the hearing screening/environment.

1. Contaminant Exposure

Exposure to contaminants may occur when:

- Performing a visual inspection;
- Handling and placing earphones on ears;
- Handling and placing OAE/tympanometers probe tips in ears;
- Testing children with suspected head lice or scalp infections; or
- Handling toys used for play audiometry and touching work surfaces; or
- Handling hearing aids and earmolds

2. Controlling Contaminant Exposure

The following are three levels of contaminant control:

- *Cleaning* – gross removal of germs, but germs are not killed.
- *Disinfection* – germs are killed.
- *Sterilization* – 100% of germs are killed through heat and pressure or chemically. An autoclave is preferred, but may not be appropriate if materials may melt.
 - *Note:* This type of contaminant control typically occurs in a clinic setting.

3. Disinfecting Probe Tips (Tympanometer/Otoacoustic Emissions) and Non-Disposable Otoscope Specula

- Use disinfectant wipes, one wipe per use, or
- Soak in disinfectant solution, or
- Use an ultrasonic cleaner with disinfectant solution

4. Disinfecting Ear Phones

- Use disinfectant wipes, one wipe per use
- Avoid getting moisture in the earphone diaphragm
- Rubbing alcohol is not recommended

5. Best Practices for Contaminant Control

In order to protect the technician, as well as to avoid cross contamination between children, the following procedures are recommended:

- Remove jewelry, such as rings, to eliminate contamination by microorganisms that may be underneath
- Wash hands before and after screening each child
 - Use a medical-grade antibacterial soap (bar soap is not recommended)
 - Thoroughly rinse with water
 - Dry hands by blotting, as rubbing will cause chaffing
 - Turn off water using a paper towel in order to avoid re-contaminating hands
- An antibacterial hand gel or wipe may be used to supplement hand washing

Appendix C: Parent Letters

The following letters were created as a template. These letters can be modified to meet the needs of your school district. An electronic copy of this Word Document can be obtained by emailing newbornscreen@health.ok.gov.

Caregiver Notification of Hearing Screening

Caregiver Notification of Results

Passed Hearing Screening

Referral for Further Hearing Testing

Appendix C Parent Letters

Letter: Caregiver Notification of Hearing Screening (Suggested Content)

(Date)
(Address)
(City, State, and Zip)

Dear Parent or Guardian,

Hearing is very important to children's abilities to listen, learn and make good progress in our school. For these reasons, the school district takes a special interest in the hearing of all of the children.

Hearing screenings will be available to each student in your child's classroom. The hearing screening has been scheduled for (Date). Results will be available to you a few days after the screening date.

If your child will not participate in this screening, please fill out the bottom of this letter and return to the school as soon as possible.

If you have concerns about your child's hearing or questions about the screening program, please contact us. Our telephone number is (phone number).

Sincerely,

(Coordinator, Hearing Screening Program)

Date: _____ Name: _____

____ We request that our child **not** participate in the hearing screenings at the school

Signature of Parent/Guardian: _____

Appendix C Parent Letters

Letter: Passed Hearing Screening (Suggested Content)

(Date)
(Address)
(City, State, Zip)

Dear Parent / Guardian:

Recently, your child participated in the hearing screening at the school. We are pleased to inform you that your child passed the hearing screening. Good hearing is important for your child's academic success.

This is only a screening; however, and does not necessarily mean that your child is not experiencing any hearing difficulties. If at any time you have concerns about your child's hearing or speech and language, please let us know as well as your primary care physician.

If you have questions regarding the hearing screening program, please call us at (number)

Sincerely yours,

(Coordinator, Hearing Screening Program)
Letter: Referral for Further Hearing Testing

Appendix C Parent Letters

Letter: Referral for Further Hearing Testing (Suggested Content)

(Date)
(Address)
(City, State, Zip)

Dear Parent/Guardian:

This is to inform you that your child did not pass the recent hearing screening at the school. Results may or may not indicate the possibility of a hearing loss. We strongly recommend that your child receive a complete diagnostic hearing evaluation. Please contact your primary care physician for a referral to an audiologist in your area. An audiologist is a certified and licensed health professional who specializes in the identification, assessment, and management of hearing loss.

A copy of the screening form is enclosed as well as a list of audiologists in the area.

If you have questions about the screening results or if you need further information about the recommended referral, please call (number).

Sincerely,

(Coordinator, Hearing Screening Program)

Enclosures

Appendix D: Conventional Pure Tone Audiometry - Components

- Components: All devices have certain features and controls in common:
 - a. Earphones: The earphones included with the audiometer are color-coded with the red one for the right ear and the blue one for the left ear. Earphones are rather fragile equipment and care must be taken that they are not dropped or otherwise damaged. **Earphones are matched and calibrated to a particular audiometer and therefore cannot be switched to another instrument.**
 - b. Power On-Off: This switch controls the electrical power to the audiometer and should be left "on" for the entire day's testing.
 - c. Frequency Selector: This control selects the test frequency in Hz. It may have a range from 125 Hz to 8000 Hz in discrete steps, or it may have a more limited range (e.g. 250 Hz - 6000 Hz).
 - d. Attenuator: This control is calibrated in decibels (dB) and is used to vary the intensity of the test tone. Its settings may range from 0 dB HL to 110 dB HL. Attenuators usually are calibrated in 5 dB steps or in smaller increments.
 - e. Output Selector: This switch allows the tone to be presented individually to either the right or left earphone. Some audiometers may have settings for "bone" or "group." These selections are not used for individual pure tone screening.
 - f. Tone Presentation Switch: This control presents the test signal when it is pressed. It may be a button, a bar or a lever and, typically, little pressure is needed to activate it.
 - g. Tone Mode Switch: This switch controls the method of tone presentation. Usual position choices are NORM OFF, NORM ON or PULSED. Hearing screening is performed with this switch in the NORM OFF or PULSED position.
 - h. Signal Selector: Some audiometers may provide a switch allowing for tone and speech testing. This control is typically labeled "tone", "mic" and "tape". The switch must be placed in the "tone" position for hearing screening.
 - i. Masking Control: This control may be found on some audiometers used for screening. It should be left OFF during hearing screening.

Appendix E: Otoacoustic - Components

- Components: All devices have certain features and controls in common. Features will vary depending on model. Always refer to manual for your specific piece of equipment.
 - a. Automated OAE Screener with Probe/Microphone Assembly
 1. Display screen – A “Pass” or “Refer” message will appear after screening completed.
 2. Test Button – This control initiates screening.
 3. Probe/Microphone – This instrument is inserted in the individual’s ear and presents tones of various frequencies. It then measures the function of outer hair cells within the cochlea/inner ear.
 4. Battery indicator – This graphic indicates when the battery life is low and the screening equipment needs to be plugged in for continued use.
 - b. Probe tips: This accessory is used to obtain a seal when placed in the individual’s ear to enable screening. A wide range of sizes are available and should be selected for a snug fit after inspecting a patient’s ear canal size. Probe tips can be disposable or reusable. Check with the vendor or manual regarding re-use and or cleaning techniques.
 - c. Quick Check Cavity: This accessory is used with the probe to allow for a functional check of the screener.
 - d. Power Supply/Charger: This accessory supplies power to the screening equipment.
 - e. Printer with paper: This accessory gives the provider the option of printing results of the screening.

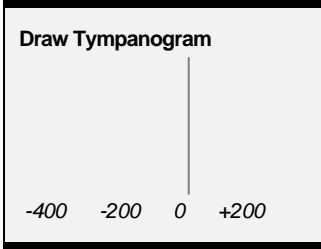
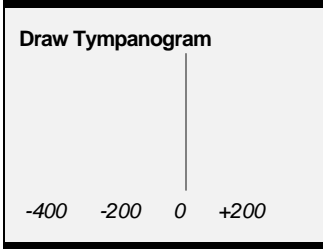
Appendix E: Tympanometry – Components

- Components: All devices have certain features and controls in common. Features will vary depending on model. Always refer to manual for your specific piece of equipment.
 - a. Automated probe assembly: This instrument is inserted in the individual’s ear. It presents a tone while introducing a change of air pressure in the individual’s ear that measures the status of the middle ear.
 - b. Display screen: The screen provides a display of the individual’s tympanogram as well as the canal volume, admittance peak, and pressure peak.
 - c. Probe tips: This accessory is used to obtain a seal when placed in the individual’s ear to enable screening. A wide range of sizes are available and should be selected for a snug fit after inspecting a patient’s ear canal size. Probe tips can be disposable or reusable. Check with the vendor or manual regarding re-use and or cleaning techniques.
 - d. Power Supply/Charger: This accessory supplies power to the screening equipment.
 - e. Printer with paper: This accessory gives the provider the option of printing results of the screening.

Appendix F: Individual Hearing Screening Form

NAME _____ SEX _____ BIRTHDATE _____ DATE _____
SCREENER _____ TITLE _____ SITE _____

INSTRUCTIONS FOR TYMPANOMETRY SCREENING: For each ear, draw the tympanogram and record the type, canal volume, admittance peak, and pressure peak in the appropriate boxes according to screening results. See flowchart on reverse of this page.

RIGHT EAR		LEFT EAR								
 Draw Tympanogram -400 -200 0 +200	<table border="1"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table>					<table border="1"><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr><tr><td> </td></tr></table>				
	Type									
	Canal Volume									
	Admittance Peak									
	Pressure Peak									
		 Draw Tympanogram -400 -200 0 +200								

Otосcopy? Yes No

INSTRUCTIONS FOR CONVENTIONAL PURE-TONE AUDIOMETRY SCREENING: Present a 20dB HL signal at each screening frequency. Not responding to the 20 dB tone at any frequency in either ear shall constitute a does not pass. Record a "+" (plus) for "pass" or "-" (minus) for "does not pass" in the appropriate boxes

RIGHT EAR	<table border="1"><tr><td style="text-align: center;">1000 Hz</td><td style="text-align: center;">2000 Hz</td><td style="text-align: center;">4000 Hz</td></tr></table>	1000 Hz	2000 Hz	4000 Hz	LEFT EAR	<table border="1"><tr><td style="text-align: center;">1000 Hz</td><td style="text-align: center;">2000 Hz</td><td style="text-align: center;">4000 Hz</td></tr></table>	1000 Hz	2000 Hz	4000 Hz
1000 Hz	2000 Hz	4000 Hz							
1000 Hz	2000 Hz	4000 Hz							

INSTRUCTIONS FOR OTOACOUSTIC EMISSIONS SCREENING: Indicate screening results for each ear. Record a "+" (plus) for "pass" or "-" (minus) for "does not pass" in the appropriate box.

RIGHT EAR LEFT EAR

SCREENING RESULTS: Pass Does Not Pass

RECOMMENDATIONS: Rescreen in 4-6 Weeks Audiologic Referral
PCP Refer Speech-Language Referral

COMMENTS _____

Appendix G: Classroom Roster Form

Teacher _____ Grade _____ Room _____

Date _____ School _____

NOTE TO CLASSROOM TEACHER: This form serves as a master list of your students for the hearing screening program. Please list the name and birth date of each student in the space provided below. If you have specific concerns regarding hearing or the ears of a particular student, please list his or her name and your concern on a separate sheet of paper and attach it to this one.

	NAME OF STUDENT (List Alphabetically)	DOB	DATE SCREENED	RESULTS P = Pass R = Not Pass	WHO REFERRING TO (Ex. Audiologist, Primary Care Provider, Speech-Language Pathologist)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					