

## **SUBJECT: HEARING SCREENING IN SCHOOL SETTINGS**

**POLICY RECOMMENDATION:** Students should be screened for hearing deficiencies according to requirements of the Individuals with Disabilities Education Act and the South Carolina Department of Health and Environmental Control (SCDHEC) School Screening Recommendations.

### **RATIONALE:**

Early detection of hearing loss is vital for prompt remediation and rehabilitation since undiagnosed hearing loss may result in:

- A delay in speech and language skills;
- Language deficits that may lead to learning problems and limited academic achievement;
- Difficulties in communication that may lead to social, emotional, and behavioral problems; and/or
- A negative impact on a student's health and safety.

### **STANDARDS:**

1. School nurses, working collaboratively with the school district's audiologists and speech-language pathologists, should organize and implement hearing conservation programs, provide hearing screenings according to the SCDHEC School Screening Recommendations, and provide annual hearing screening evaluations for students receiving special education services.
2. Hearing screenings should be conducted in a quiet environment with minimal visual and auditory distractions, where ambient noise levels are sufficiently low to permit accurate measurements.
3. Sound intensity is measured in decibels (dB). Sound frequency is measured in hertz (Hz).
4. Hearing screenings should be performed using a pure-tone audiometer that has been maintained and calibrated annually according to the manufacturer's guidelines.
5. Pure-tone audiometers used in school screening programs should meet the standards for screening audiometers established by the American National Standards Institute (ANSI S3.6-1989). Pure-tone audiometers should include, at a minimum, air frequencies of 500, 1000, 2000, and 4000 Hz.
6. Speech stimuli in lieu of frequency-specific stimuli; nonconventional instrumentation, such as hand-held devices; noncalibrated signals (e.g. noisemakers, whisper); group screening procedures; and transient evoked

otoacoustic emissions or distortion product otoacoustic emissions testing are not recommended for use in school hearing screening programs.

7. Screening should be conducted in a manner congruent with infection control and universal precautions. The headset and the screener's hands should be cleansed prior to screening each student.
8. Students should be asked to remove any items such as food, gum, or candy from the mouth because chewing on items could make hearing the tones difficult.
9. During the screening procedure, if a student fails to respond to a tone the screener must not ask the student if the tone was heard. The student must give independent, uncoached responses. A "yes" answer to a question regarding whether the student heard the tone may not be considered as a pass.
10. Parents/legal guardians should be notified of their child's screening results and provided suggestions for preserving the student's ability to hear.
11. Young students and students with development delays who do not respond to conditioning for signaling when a tone is heard during the screening activity and students who fail the screening should be appropriately referred for a professional audiological evaluation according to the school district's policy.
12. The student's hearing screening results should be documented in the student's school health record.
13. The school nurse or other assigned school employee should follow-up with the student's parent or legal guardian to assist with completion of a referral for a professional audiological evaluation. The hearing status of referred students should be confirmed within one month, and no later than three months, after the initial screening.
14. The school principal, or his/her designee, should be kept abreast of the status of students who were referred for a possible hearing deficiency. In some school districts, it may be appropriate to also notify the Special Services Director / Coordinator for Hearing Services, Teacher of the Deaf or Hard and Hearing, School-Based Audiologist or the Speech-Language Pathologist.
15. All referral follow-up should be documented in the student's health record.
16. An audiologist should screen students attending school who are less than 3 years of age.
17. Students with known hearing deficiencies who are being treated by a hearing specialist should not be screened in the school setting.

## PROCEDURAL GUIDANCE:

### Preparation

1. Work with the appropriate persons within the school to coordinate the screening activity. The process for coordination with school administrators and teachers varies among schools. There may be preferred classes during which screenings are usually allowed.
2. Determine the process for referring students for a professional audiological evaluation in your school. Some school districts employ a full-time audiologist, some contract for audiology services, and others refer to audiologist in the community.
3. Prior to screening, students should be given an explanation of the effects of noise exposure on hearing, ways to protect/preserve their ability to hear, and an overview of the screening process. This may be done via a classroom instructional unit or if necessary, individually.
4. Check to be sure that the audiometer has been calibrated to meet ANSI S3.6-1989 Standards. Calibration should be performed at least annually.
5. Gather supplies and forms:
  - Forms for documenting screening results (See the second page of the parent notification form in the Appendix.),
  - Parent notification forms (See sample in Appendix),
  - Parent letter regarding earwax removal in case needed (Available on-line at <http://www.scdhec.gov/health/mch/wcs/school/links.htm>),
  - Cleanser for the headsets (follow manufacturer's instructions),
  - Paper towels (While there are no data to suggest that head phones used during hearing screenings are a major avenue for transferring head lice, examiners may wish to place a clean paper towel on each student's head prior to positioning the head phones. Even when using a paper towel, the headset should be cleaned between each student.), and
  - Hand cleanser.
6. Locate a quiet room with minimal visual stimuli for conducting the hearing screenings. To determine if the room is quiet enough for valid audiometric screening, set up the audiometer in the room and test yourself or someone with normal hearing under earphones at 1000 Hz, 2000 Hz, and 4000 Hz at a level of 20 dB. The right ear and the left ear should be tested. If you (or the person being tested) are unable to hear the frequencies, change to a quieter room and perform the test again in the new location. Repeat this process until you find a room where the frequencies can be heard.
7. Prior to conducting the screening, set up the room for screening one student at a time. Consider the following when arranging the room:

- Ensure each student's privacy during the screening.
  - The student being screened should not be able to see other children or see the dials on the audiometer.
  - The student should be seated facing away from the audiometer.
  - The examiner should be seated behind the student's chair facing the audiometer controls.
  - To assist with the flow of students, you may wish to have a teacher or staff assistant monitor students waiting to be screened in an adjacent room or hallway. Once a student has been screened, he/she can join his/her classmates and the next student to be screened can then enter the screening room.
8. On the day of the screening, re-evaluate whether the screening room is quiet enough for valid audiometric screening. If the noise level in the room is not conducive to testing, change to a quieter room and evaluate the new location. If you are not able to find a room where the frequencies can be heard, postpone the screening activity until an appropriate room is available.
  9. Prior to bringing students in for screening check to be sure that the audiometer is working properly. If the audiometer is not functioning properly:
    - Check to be sure the audiometer has been turned on.
    - Assure that the earphones are plugged into the audiometer. If they are plugged in, unplug them and plug them in again.
    - Check to be sure that the electrical outlet (power source) is functional by unplugging the audiometer and testing the outlet with an electrical device that you know works. If the power source is not functional, check to determine if a light switch perhaps controls the electrical power to the outlet.
    - If the audiometer still does not work try to locate another audiometer. If a functioning audiometer is not available, postpone the screening activity until a functioning audiometer is available.
  10. On the day of the screenings, the audiometer should be left on during the entire testing day.

### **Pure-Tone Air Conduction Screening**

1. Explain to the student that you are going to test his hearing and that he is going to hear sounds through the earphones. Tell him that he should raise his hand high and quickly put it down every time he hears the sound.
2. Seat the student so that he faces away from you and he cannot see your hands as the audiometer is being manipulated.
3. Expand the headset to full size and place the red earphone on the right ear and the blue earphone on the left ear. Hold the earphones in place and then adjust the headset to fit the student's head.

- The center portion of the earphone should be placed directly over the external auditory canal.
  - You may wish to place a clean paper towel as a barrier between the student's hair and the head set.
  - The student may need to remove eyeglasses and large earrings or adjust hair to allow for correct placement of the headset and/or earphones.
4. Set the audiometer to present tones to the right ear.
  5. Set the frequency at 1000 Hz and the intensity at 40 dB. Presentation this high above the normal screening level gives the student a sample of the tone for which the student should listen.
  6. Change the intensity to 20 dB and present the tone at 1000 Hz for one second.
  7. Document pass or fail for this level. If the student hears the sound, record "pass". If the student does not hear the sound, record "fail".
  8. Switch to 2000 Hz and present the tone for one second. Document pass or fail for this level.
  9. Switch to 4000 Hz and present the tone for one second. Document pass or fail for this level.
  10. Move the selector to the left ear.
  11. Present the tone at 4000 Hz, 20 dB for one second to the left ear. Document pass or fail for this level.
  12. Switch to 2000 Hz and present the tone for one second. Document pass or fail for this level.
  13. Switch to 1000 Hz and present the tone one second. Document pass or fail for this level.
  14. Interpret the results as follows:
    - Pass = Student passed each frequency (1000 Hz, 2000 Hz, and 4000 Hz) at 20 dB in both ears.
    - Rescreen = Student failed to hear one or more of the frequencies (1000 Hz, 2000 Hz, or 4000 Hz) at 20 dB in either ear.
  15. If the student failed to hear one or more of the frequencies in either ear, ask the student whether he has been sick or had any symptoms of an upper respiratory infection (runny nose, stuffy nose, fever, ears stopped up, watery eyes, ear pain, sore throat, cough, etc.). If the nurse has access to an otoscope, the nurse may check the student's ears for possible fluid, infection or excessive cerumen. If the

nurse's evaluation suggests a possible upper respiratory infection and/or excessive cerumen, the student's parent or legal guardian should be notified and appropriate referral advised. Screen the student again in two weeks.

16. If there is no evidence of an upper respiratory infection, excessive cerumen, or fluid and no change in the noise level in the testing room that would preclude rescreening, immediately rescreen the student if he did not pass the initial screening. Remove the earphones, re-instruct the student to be sure that he understands what he is to do, reposition the earphones, and then rescreen.
17. If the student fails to hear one or more of the frequencies (1000 Hz, 2000 Hz, or 4000 Hz) in either ear during the re-screen, refer the student for a professional audiological evaluation according to the school district's policy.

See Table 1 on page 10 for a brief summary.

### **Special Consideration for Students 3 to 5 Years of Age and/or Students with Developmental Delays**

1. Screening young students or students with developmental delays may require a different approach than that used with other students. Some school districts have established screening teams of nurses especially gifted in working with young children and students with developmental delays.
2. Some suggestions for gaining the cooperation of young students or students with developmental delays include:
  - Allowing the student to watch other students or a trusted caregiver being tested.
  - Making the screening procedure seem like a fun game. You may call it a "listening game."
  - Praising the student promptly for correct responses.
  - Being organized so that you can perform the test as quickly and efficiently as possible because young students may tire and bore easily.
3. "Conditioning" students to respond when the tone is heard may be necessary. A parent or teacher may be able to help by working with the student or a group of students prior to the hearing screening to teach the student(s) to perform a specific task when a certain stimulus is heard. (Example: A parent or teacher may teach a student to place an object in a bucket each time a specific sound is heard.)
4. To begin the conditioning process during the screening, have a toy, such as a bell or blocks and a bucket, for the student to use to signal when the tone is heard through the earphones. A "play task" such as putting a block in a bucket or ringing a bell each time a tone is heard may help to hold the student's interest. You may think of other "play tasks" that may be used. (If a teacher or parent is

going to work with a student(s) prior to the screening it is helpful to use the same or a similar “play task” that the parent or teacher used.)

5. Seat the student so that she faces you.
6. Place the audiometer so that the student will not be able to see your hands as you later manipulate the audiometer to present the tones. You may lean in to use your body to prevent the student from seeing your hand or arm movements as you present the tones.
7. Explain to the student that you are going to test her hearing and that she is going to hear sounds through the earphones. Explain the play task, for example tell her that you would like for her to ring the bell or drop a block into the bucket every time she hears the sound.
8. With the earphones facing outward (apart) and off of the student’s head, place the audiometer at 1000 Hz at the highest intensity level (dB). Present the tone.
9. Ask the student if she heard the sound. The student must agree that she heard the sound in order to continue. It is impossible to condition a student to respond to a sound that she cannot hear. If she says that she doesn’t hear the sound, use a different sound at 2000 Hz or 4000 Hz. If the student continues to be unable to hear the sound, end the screening attempt and follow the school district’s policy for referring a student for a professional audiological evaluation.
10. If the student hears the sound, tell the student that every time she hears the sound she can ring the bell or drop a block into the bucket (depending upon the play task being used).
11. Place the bell or block in the student’s hand and then gently hold the student’s hand in your hand. Present the tone. Help the student ring the bell or drop the block into the bucket.
12. Repeat #11 until the student has caught on. The student has caught on when she tries to perform the “play task” by herself when the tone is presented. Reward the student verbally when she makes the correct response.
13. Tell the student she can do it by herself now.
14. Present the tone. If she performs appropriately, present the tone again to assure that the student understands the task. If she performs appropriately again, proceed with the screening.
15. If the student seems confused at any time during the remaining screening steps, go back to #8 and repeat the conditioning procedure. If a second attempt to

condition the student fails, end the screening attempt and follow the school district's policy for referring students for a professional audiological evaluation.

16. Turn the audiometer down to 60 dB at 1000 Hz in the right ear and ask the student if she is ready to ring the bell or drop the block into the bucket herself.
17. Explain to the student that you are going to help her put the earphones on so that she will be able to listen to the sound through the earphones.
18. Expand the headset to full size and place the red earphone on the right ear and the blue earphone on the left ear. Hold the earphones in place and then adjust the headset to fit the student's head.
  - The center portion of the earphone should be placed directly over the external auditory canal.
  - You may wish to place a clean paper towel as a barrier between the student's hair and the head set.
  - The student may need to remove eyeglasses and large earrings or adjust her hair to allow for correct placement of the headset and/or earphones.
19. Present the tone at 1000 Hz, 60 dB. If the student does not respond, check the placement of the earphones and try the tone again (Remember #15).
20. If the student hears 60 dB, present the tone at 40 dB (Remember #15).
21. If the student hears 40 dB, present the tone at 20 dB (Remember #15).
22. If the student responds appropriately at 20 dB, the student is ready to begin the actual screening procedure (Keep #15 in mind).
23. Seat the student so that she is facing away from you and she cannot see your hands as the audiometer is being manipulated.
24. Use the same procedure for presenting the tones as described in steps 6 through 13 in the Pure Tone Air Conduction Screening section (page 5) EXCEPT present each tone two times; if the student fails to hear one of the two presentations, present the tone a third time.
25. Record the results each time that the tone is presented. If the student hears the tone, record "pass". If the student does not hear the tone, record "fail".
26. Do not present the tones in any type of rhythmic fashion. Vary the timing between presentations of the tone so that the student cannot predict when the next tone will be presented.
27. Interpret the results as follows:



- Pass = Student has passed two tone presentations at 20 dB at each frequency (1000 Hz, 2000 Hz, and 4000 Hz) in each ear.
- Refer = Student failed to hear two tone presentations at 20 dB at one or more of the frequencies (1000 Hz, 2000 Hz, or 4000 Hz) in either ear.  
The student should be referred for a professional audiological evaluation according to the school district's policy.

See Table 2 on page 10 for a brief summary.

Table 1

<b>Brief Summary of Pure Tone Conduction Screening (Read the entire procedure for important details.)</b>
<p>Seat the student facing away from screener.</p> <p>Position headset with red earphone over right ear; blue earphone over left ear.</p> <p>Screen Right Ear at 20 dB            1000 Hz (present tone for one second)            2000 Hz (present tone for one second)            4000 Hz (present tone for one second)</p> <p>Screen Left Ear at 20 dB            4000 Hz (present tone for one second)            2000 Hz (present tone for one second)            1000 Hz (present tone for one second)</p> <p>If a student fails to hear a tone at one or more frequency in <i>either</i> ear at 20 dB, evaluate for upper respiratory infection, ear infection, or excessive cerumen. If there is evidence of an upper respiratory infection, ear infection, or excessive cerumen, contact the student's parent and advise appropriately. Rescreen the student in 2 weeks.</p> <p>If a student fails to hear a tone at one or more frequency at 20 dB in <i>either</i> ear and there is no evidence of an upper respiratory infection, ear infection, or excessive cerumen, evaluate whether the noise level in the room is still conducive to screening and if it is, rescreen the student immediately.</p> <p>Refer student for a professional audiological evaluation if the student fails to hear a tone at one or more frequency at 20 dB in <i>either</i> ear when rescreened.</p>

Table 2

<b>Students 3 to 5 Years of Age and/or Students With Developmental Delays (Read the entire procedure for important details.)</b>
<p>Condition the student to respond to the tones using a "listening game" approach.</p> <p>After successful "conditioning," seat student facing away from screener.</p> <p>Position headset with red earphone over right ear; blue earphone over left ear.</p> <p>Screen Right Ear at 20 dB            1000 Hz (present tone for one second 2 times*)            2000 Hz (present tone for one second 2 times*)            4000 Hz (present tone for one second 2 times*)</p> <p>Screen Left Ear at 20 dB            4000 Hz (present tone for one second 2 times*)            2000 Hz (present tone for one second 2 times*)            1000 Hz (present tone for one second 2 times*)</p> <p>*If the student fails to hear one of the two presentations, present the tone a third time.</p> <p>Refer student for a professional audiological evaluation if the student fails to hear two of the presentations at 20 dB at one or more of the frequencies in <i>either</i> ear.</p>

## **REFERENCES:**

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Cunningham, M. & Cox, O.. Clinical Report - Hearing Assessment in Infants and Children: Recommendations Beyond Neonatal Screening. Pediatrics (February 2, 2003), 111(2): 436-440.

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Appendix



SCHOOL HEALTH PROGRAM  
HEARING SCREENING REPORT

Student's Name:	DOB:	Grade:
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Dear Parent/Guardian:

Your child had a hearing screening performed by the school nurse as one of the services provided at school. The hearing screening results indicate that:

- your child's hearing is within a normal range. The results are noted on the back of this form.
- your child has ear wax build up that may be keeping him/her from hearing well. I have attached some instructions that may help with removing ear wax. Let me know if you have any questions. We will rescreen your child in about 2 weeks.
- your child may have an upper respiratory infection or an ear infection that is keeping her/him from hearing well. Your child's health care practitioner will be able to tell you whether special treatment is needed. We will rescreen your child in about 2 weeks. Let me know if you have any questions or need help locating a health care practitioner to see your child.
- your child may have a problem hearing. It is important to have your child's hearing evaluated by an audiologist as soon as possible. Please call me to discuss your child's screening results. The results are noted on the back of this form.

Hearing loss can sometimes be prevented. Noise-induced hearing loss occurs when tiny sensory hair cells in our inner ears are damaged by noises that are too loud and that last for too long.

We are encouraging all parents to teach their children to **BAT**:

- B**lock loud noise (wear earplugs or earmuffs).
- A**void loud noise (walk away).
- T**urn down the sound.

*Thank you for keeping your child healthy.  
Healthy children learn better.*

Nurse (signature):	Date:
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Nurse (print):
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School:	School Phone & Fax:
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Address:
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Student's Name:	DOB:	Grade:
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**School Hearing Screening Results:**  
(P = student heard the tone; F = student did not hear the tone)

Date:			Date:			Date:		
Hearing Status at 20 dB			Hearing Status at 20 dB			Hearing Status at 20 dB		
Hz	Right	Left	Hz	Right	Left	Hz	Right	Left
1000 Hz			1000 Hz			1000 Hz		
2000 Hz			2000 Hz			2000 Hz		
4000 Hz			4000 Hz			4000 Hz		

Nurses Notes:	Check information below if applicable: <input type="checkbox"/> Conditioned play techniques used. <input type="checkbox"/> Alternate screening method used. See notes.  Signature: _____  Date: _____
	School: _____ School Phone & Fax: _____

**Evaluation Results (To be completed by Health Practitioner or Audiologist)**

Diagnosis / Treatment Plan:
Recommendations for school:

Provider's Signature:	
Date:	
<i>Please print or use a stamp:</i> Provider's Name Office Phone #	