

GUIDELINES FOR THE

SCHOOL HEARING SCREENING
PROGRAM

FOR

PENNSYLVANIA'S SCHOOL AGE
POPULATION

DEPARTMENT OF
HEALTH

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The latest revisions to this manual reflect changes that have occurred in the Department of Health's Speech and Hearing Program, now called the Hearing Services Program, rather than changes in the screening procedures.

PREFACE

The Guidelines for the School Hearing Screening Program for Pennsylvania's School Age Population represents the minimal program which each district is to provide. It has been written to address the many questions and concerns expressed by school district staff to the Division of School Health and to the Hearing Services Program staffs over the past several years.

The purpose of the guide is to make explicit the intent of the law and to provide school district administrators and school health staff directions in implementing the law and for case management.

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SCHOOL HEARING PROGRAM

I. INTRODUCTION

The purpose of the school hearing screening and threshold testing program is to identify children with hearing impairments. Such a program is part of a total hearing conservation and rehabilitation effort and aids in the teaching of the prevention of hearing loss, planning for medical treatment, and educational programs for the child with significant loss.

Results of hearing screening program have shown that five to ten percent of the school age population do not pass audiometric tests. The majority of these children are in need of medical treatment. Such treatment may result in restoration of hearing and prevention of permanent hearing impairment. Approximately two percent will show permanent hearing impairment and will require special educational services.

Communication is an integral part of human behavior. Seldom does one consider the implications of not being able to hear. The most serious effect of a hearing loss is the interference with and breakdown of communication between persons. In a child, some of the consequences may be:

- (a) Interference with normal speech and language development.
- (b) Development of abnormal social growth and behavior.
- (c) Interference with education and human potential.
- (d) Development of adjustment problems in the child and his/her family.
- (e) Isolationism in a hearing world.

A child's behavior in the classroom may indicate the possibility of a hearing loss. The child may be inattentive, may ask for frequent repetitions, or his/her achievement may be low. The observation of such behavior will assist in identifying children in need of help and indicate the need to assess hearing levels.

II. ANATOMY AND PHYSIOLOGY OF THE EAR

“The ear receives sound waves which are processed and transmitted to the hearing center in the brain for interpretation. The ear is divided into three parts: outer, middle, and inner.

The outer ear consists of the auricle or pinna and external auditory canal. The auricle, or visible part of the ear, directs and concentrates the sound waves along the external ear canal to the tympanic membrane. The ear canal contains hairs and wax producing glands which serve to protect the eardrum from dirt, insects, or foreign matter. The tympanic membrane is a thin diaphragm which completely closes the end of the ear canal and separates the outer ear from the middle ear.

The middle ear is a tiny, air-filled cavity between the eardrum and the bony wall of the inner ear and contains the three smallest bones, called ossicles. The first bone in the ossicular chain is the hammer (malleus) which is attached to the ear drum. The anvil (incus) fits between the hammer and the third bone, known as the stirrup (stapes). The footplate of the stapes is set in the window of the inner ear. A passage between the middle ear and the back of the nose (eustachian tube) serves as a means for equalizing air pressure and ventilating the middle ear cavity.

The inner ear contains the sensory organ for balance (including the semi-circular canals) as well as the organ for hearing known as the cochlea. The cochlea resembles a snail shell in appearance and is filled with fluid. Sound vibrations from the eardrum are transmitted through the ossicular chain to the oval window to the fluid in the cochlea. The sound sets in motion thousands of hair-like sensory cells in the cochlea called the Organ of Corti. These sensory cells transform fluid movements into electrical impulses and, by a series of complicated processes, transmit them to the auditory nerve to the brain, where they are perceived as sound.

The school nurse must know and understand the anatomy and physiology of the ear if she/he is to understand the results of hearing tests. Interpretation of the findings of the hearing tests are often based on the structure and functioning of the ear and its many parts. It is easier for the teacher to understand the problem of a child with a hearing loss if the nurse will first explain the functioning of the ear, and then explain how the child's problem relates to the functioning of the ear.”¹

¹ National Association for School Nurses, Hearing Screening Guidelines, p.4.

III. HEARING DISORDERS

“The two most common types of hearing loss found in school age children are sensorineural (permanent) losses, and conductive (not permanent) hearing loss. Sensorineural loss can result from inner ear defects; auditory nerve damage, or damage to the auditory center in the temporal lobe of the brain. Known causes of sensorineural losses include viral (especially measles and mumps) and bacterial infections; prolonged exposure to loud noises such as rock bands, gunfire, motorcycles, and power motors; ototoxicity; congenital abnormality; and head trauma. Treatment for these losses includes auditory training with amplification devices (hearing aids); and special habilitation, including speech reading (lipreading) and speech therapy.

Conductive hearing loss, which is the most common loss in children, results from a problem in the external ear canal, tympanic membrane, or middle ear cavity, interfering with the transmission of sound. Causes include impacted earwax, foreign objects (beans, erasers, cotton, etc.) in the ear canal, otitis media, congenital abnormalities, and ruptured or scarred eardrums secondary to trauma or infection. Conductive losses can be mild or more severe, and are considered significant when they interfere with a child’s ability to communicate effectively. Many cases of conductive loss respond to medical or surgical treatment. However, these losses may fluctuate over time so that a pupil who is referred to a physician for follow-up may not be experiencing the loss at the time of medical evaluation. This is another strong argument for the necessity of rescreening before referring a pupil.”²

It is possible to have a conductive and sensorineural hearing loss at the same time. An individual with a document history of fluctuating hearing loss may need immediate intervention to detect the need for medical treatment and to prevent permanent damage.

² Wold, Susan. School Nursing, p. 303.

Effects of Hearing Loss

Threshold	Degree of Loss	Effects
15 to 30 db	Mild (hard of hearing)	Difficulty hearing faint or distant speech; may require hearing aid; needs preferential seating in classroom.
30 to 50 db	Moderate (hard of hearing)	Difficulty hearing distant speech; requires amplification; preferential seating, auditory training, and probably speech therapy.
50 to 70 db	Moderate to severe	Difficulty with conversation, unless loud; great difficulty in group/classroom discussion; requires hearing aid; may require special class for hard of hearing.
70 to 90 db	Severe (deaf)	May hear loud voice close to ear; may hear some vowels, recognize some sounds in environment; needs special education for the deaf, with specific training in speech language.
Over 90 db	Profound (deaf)	May hear some loud sounds; does not rely on hearing for communication; requires special education for the deaf.

IV. LEGAL BASIS FOR PENNSYLVANIA'S SCHOOL HEARING PROGRAM

The Public School Code of 1949's (24 P.S. § 14-1402 (a) (2)) is the legal basis of the Pennsylvania School Hearing Program (Appendix A). The Code requires that each child of school age be given a hearing test by a school nurse or medical technician, using methods established by the Advisory Health Board.

Regulations of the Department of Health, Title 28, Part III, Prevention of Diseases, Chapter 23, School Health, § 23.5 and § 23.6, specifies what screening tests are to be performed, test equipment to be used, frequencies to be employed, and pupils to be tested (Appendix B). In accordance with the law, screening of children for hearing problems is essentially the responsibility of the school nurse. The law requires that an individual pure tone audiometer, or other screening equipment approved by the Secretary of Health, be utilized for hearing screening and threshold testing.

Frequencies employed for the hearing (sweep) test are 250, 500, 1000, 2000, and 4000 Hz (Hertz, formerly cycles). Frequencies employed for threshold testing are 250, 500, 1000, 2000, 4000, and 8000 Hz. § 23.5 (d) of Pennsylvania's Regulations requires, each year, pupils in Kindergarten; Grades 1, 2, 3, 7, and 11; and those in special, ungraded classes, be given a hearing (sweep) test. Testing is recommended for all new children entering the school who do not have documented audiometric hearing test results.

§ 23.6 (d) of the Regulations requires threshold testing for the following pupils:

- (1) Any pupils in any grade who is known to have a loss which meets or exceeds the criteria for otologic referral established by the Department of Health shall be given a test each year.
- (2) Any pupil who presents a history of recurrent upper respiratory infection or may evidence other possible ear, nose, and throat pathology.
- (3) Any pupil who shows, by classroom behavior or speech pattern, or both, that a hearing difficulty may exist.

V. RATIONALE FOR PERIODIC HEARING SCREENING OF THE ADOLESCENT PUPIL

While it is extremely important to conduct hearing tests on the young, school age pupil to ensure early identification of those with hearing loss and for hearing conservation purposes, it is equally important to conduct hearing tests on the older adolescent. The older student is less likely to complain of ear or hearing problems than a younger child; the impact on their ability to perform can be as detrimental as on a young child.

Because Hearing Loss is so insidious, it should always be monitored regardless of age.

The Regulations of the Department of Health mandates Hearing Screening in the 11th grade because:

- (1) 4/5 years have passed since the last mandated hearing test;
- (2) any identification of permanent hearing loss at that age may impact upon their ability to perform in a job and/or advanced training;
- (3) of the ability to be referred to another program for assistance before or after the age of 21 (e.g. office of Vocational Rehabilitation);
- (4) adolescents have more exposure to noise levels in school at that age;
- (5) hobbies and sports activity with noise exposure are more entrenched and frequent than ever before;
- (6) it may be their last opportunity to get State assistance for surgery/amplification if needed.
- (7) hearing loss due to otosclerous may begin to become evident in the teen years while it is rare under twelve.

VI. DIFFICULT TO TEST OR UNTESTABLE PUPILS

Pupils found to be difficult to test or untestable by pure tone audiometry because of inability to respond or understand instructions should have:

- (a) An ear examination, using an otoscope, by the school physician, school nurse practitioner, or school audiologist.
- (b) Teacher input regarding child's performance in classroom.
- (c) Gross testing procedures such as alerting (eye movement, head turn, facial expression) to noise maker, finger-snap, hand-clap, crinkling paper, voice, etc., when presented at varying loudness and distance from the ear and outside the child's visual field and awareness.
- (d) Parent input regarding child's auditory awareness and responsiveness to voice, music, and sound in the home environment.
- (e) See Page 25 thru 26, "Position Statement Regarding Impedance Testing in the Schools" (Tympanometry).

VII. EQUIPMENT AND MAINTENANCE

A. The Audiometer

The instrument to be used for hearing screening and threshold testing is a pure tone audiometer which requires a 110-125 volt, 60 cycle electrical outlet. This instrument should be equipped to test the frequency range from 250 through 8,000 Hz. There should be at least one set of double headphones. Optional accessories, such as a masking device, may be included but are not required. The bone conduction testing device is not required. Audiometers are to be supplied by local school authorities.

1. Maintenance

The audiometer and headphones should be checked for proper functioning before conducting each series of tests. The audiometer should be checked by measuring the tester's hearing in the room where testing will be done.

2. Calibration

The audiometer is a delicate instrument and should be handled with utmost care. Calibration of the instrument should be done annually. If the audiometer has been dropped, earlier calibration is necessary.

Arrangements for repair and calibration services should be made with the dealer at the time of purchase. After each calibration, the dealer/lab should provide the school with a Certificate of Calibration.

This is an extremely important matter. In order to ensure proper testing and reliable test results for each pupil, school authorities must provide for reliable calibration and repair services on a regular basis.

B. Noise Reducing Earphone Cups

This type of device is not an acceptable accessory for performing hearing tests on Pennsylvania's school age population. This position is based on the Pennsylvania Speech and Hearing Association Audiology Committee's statement, i.e., "until such time as the calibration of equipment such as the noise reducing earphone cups is acceptable according to some standards such as an ANSI Standard, and until such time we can be more certain about the proper use of such equipment by non-certified audiologic personnel, we concur with the previous Audiology Committee recommendation (February, 1965) and suggest that these types of headsets not be used."

C. Otoscope

SCHOOL NURSE AND SCHOOL NURSE PRACTITIONERS TRAINED IN THE USE OF AN OTOSCOPE ARE TO EXAMINE THE EARS OF ALL PUPILS FAILING THE PURE TONE HEARING TEST. Otoscopes fitted with pneumatic bulbs are recommended. Examination of the ear canal for presence of excessive cerumen, discharge, odor, foreign bodies (including insects), and inspection of the tympanic membrane for perforation and mobility are the focus since any of the above may interfere with hearing.

D. Verbal Auditory Screener Test

Use of Verbal Auditory Screener Tests for pupils who cannot be tested by pure tone audiometer is not recommended. The VAS is based on the assumption that all pupils have a common language base. This assumption is not correct. Mass testing is broad-based. Pupils with auditory perceptual or language problems may not respond appropriately. These tests may therefore yield false positive/negative results and have the potential for either missing pupils with hearing loss or over-referral.

E. Tympanometer

See page 25 regarding the Department of Health's position concerning impedance testing in the schools.

VIII. PREPARATION FOR TESTING

A. Selection of Screening Personnel

As stated above, the Public School Code of 1949, § 1402 (a) specifies that school nurses and medical technicians (properly trained health room aide) shall perform hearing tests on each school age child.

It is important that school nurses and technicians are provided the necessary orientation and training to perform the hearing tests as prescribed by the Department of Health. School nurses are responsible for organizing, coordinating and overseeing the school hearing screening program.

Audiologists employed by school districts and intermediate units may further assess students who fail hearing tests, assist in testing difficult-to-test pupils, and administer impedance tests. School audiologists may be consulted prior to referring pupils for further evaluation.

B. Selection of the Testing Site

The room to be used for testing should be selected for its quietness. This can be checked by the tester measuring his/her own hearing in the room where testing will be done. Arrange with the school administrator to have as little noise-producing activity as possible during the testing. If prior preparations are made, the testing will take less time to complete.

The room is considered too noisy for testing if the tester cannot hear frequencies 250, 500, 1000, 2000, 4000, and 8000 Hz, at 25 dB in one ear with both earphones on. If the tester has a hearing loss, another normal hearing adult should be tested for this purpose. Selecting the proper room for testing is important.

When selecting a suitable testing area, rooms adjacent to noisy areas such as lavatories, playgrounds, noisy streets, etc. should not be considered. It is suggested that – since minimal space is required for testing – supply rooms, book storage rooms, library conference rooms, and large cupboards will prove most suitable for this purpose. The books, supplies, and other contents of such rooms may actually serve to dampen the ambient noise and thereby provide a better testing environment. Recess should be as quiet as possible, especially if recess area is near the testing room.

Children should be instructed to be as quiet as possible when going to and coming from the restroom, recess, and lunch.

C. Preparation of the Pupil

The procedure for testing should be described and demonstrated briefly to the entire class or entire group. A suggested method of carrying this out is to present exaggerated tones from the audiometer and ask the children to respond by raising their hands when they hear the tone. Practice with a group will simplify the testing on individual children. Should a child be confused, it would be wise to demonstrate with one or two tones before starting to test.

Another helpful suggestion is to have one or two children in the testing room while another is being tested. This will enable them to follow the example of the child being tested.

The following instructions should be provided to each class to be tested:

“You are going to have your hearing tested. You will hear sounds from the earphones. Some will be high-sounding and some will be low-sounding. Some will sound like whistles and some will sound like hums. When you hear the sound, no matter how soft or little it is, you are to raise your hand. Keep your hand up as long as you hear the sound, and put it down as soon as the sound goes away. When you hear a sound again, raise your hand again. Remember, no matter how soft the sound is, if you think you hear it, raise your hand.”

D. Instructions for Teachers

When screening is done in an organized manner, considerable time is saved and children with hearing loss better identified. An important factor in this type of identification audiometry is the control of ambient or environmental noise. Poor control of ambient noise has invalidated many hearing examinations. Therefore, the following recommendations are made to help insure an effective and efficient hearing screening program.

1. A tentative schedule of testing should be provided to each teacher. This will enable the teacher to plan her daily schedule and make allowances in advance for the time her class is being tested.
2. Each teacher is responsible for seeing that her class is as quiet as possible on the testing day. All group recitation, singing, and games should be eliminated for the day.
3. Each teacher is required to see that the children are arranged in alphabetical order outside the testing room. An alphabetical list should be supplied to the examiner prior to testing.

4. The next class to be tested should be notified when the number remaining in the group is down to ten children for each tester. Notification of the next class should be arranged by the school nurse.
5. Classroom teachers should explain to the class the importance of being as quiet as possible on the testing day.
6. Special teachers – particularly music and gym teachers – should consent to alter their schedules for the testing day. Perhaps these teachers could assist in monitoring the children to be tested.
7. Record the test results for each child on the pupil's School Health Record.

IX. CONDUCTING THE HEARING TEST

1. Identify pupils to be tested by using a class list.
2. Select room for testing.
3. Connect audiometer to electrical outlet. Turn audiometer on and allow to warm up at least ten minutes before the first test. Do not shut off the audiometer until all testing for the day has been completed.
4. Test your own hearing, or have another person test your hearing as previously described, to insure that the audiometer is working properly and that the noise level in the room is not too great.
5. Screening testing will be done at a 25 dB level. If noise is interfering, select another room.
6. Instruct the child to raise his/her hand or indicate in some other manner when he/she hears the tone. Demonstrating testing procedure with one or two pupils present in the room while another is being tested enables pupils to follow the example of the pupil being tested.
7. Place the headphones on the pupil from the front. Place the center of each headphones over the external canal. With some pupils, it may be necessary to push the hair back in order to have the headphones properly placed. Remove glasses, hearing aid, earrings (if necessary), etc. before testing.

X. SCREENING OPTIONS

- Individual school nurse screens each pupil as a separate activity, by class or grade.
- Individual school nurse screens each pupil as part of a nursing assessment, i.e., with other required screenings.
- Screen pupils by teams. Two (2) teams are assigned to a school. Each team is comprised of a tester and an individual whose task is to place the headset on the child. The teacher whose class is being tested can serve as monitor. There should be a third examiner to relieve the team tester for 15 minutes of each hour. Thus, each tester would operate the audiometer for 45 minutes of each hour. The person relieved can assist in some other capacity. Utilizing this plan, as many as 120 children may be tested per hour. Assuming a five hour day, it is possible to screen 600 children. In many districts, this number approximates the entire population of one school building. Each team will need one audiometer, six chairs, and one small table. A spare audiometer should be accessible during the testing day in case of equipment failure. Testing rooms must have electrical outlets.

Procedure

Written instructions should be provided to each member of the school staff so that he/she may know his/her individual responsibilities. The children in each class should be listed alphabetically and by sex, and this list should be in the hands of the teacher and examiner. The children should be positioned to correspond to the list. This list should be prepared before the testing date, and any absentees on the day of the examination should be clearly indicated. Generally, each teacher will be scheduled to bring her class to the test-room site at a specific time. Five children will be admitted to the testing room at one time. The teacher will assume the responsibility for maintaining order and seeing to it that, as one group leaves the testing room, another enters. Pertinent records will be kept by the examiners.

XI. HEARING SCREENING METHODOLOGY

A. Sweep Check Test

1. Suggested Procedure for Rapid Hearing Screening

Hearing screening should be scheduled early in the school year. In some districts, the hearing screening testing is done throughout the school year as the nurse finds time available. Because of the time involved in testing large school populations, some children with significant hearing problems may go undetected for a considerable period of time. Then, too, because of noisy environment, testing conditions in many school situations are not conducive to reliable test results.

It has long been felt that there should be an attempt to eliminate, or at least minimize, the effects of the above conditions and, at the same time, establish a method of testing that would appreciably reduce the time involved. It is with these aims in mind that the following “rapid screening procedure” was conceived and developed. Such a procedure would enable the school nurse to more expeditiously carry out the hearing testing program and thereby free a greater proportion of her time for other important duties. Moreover, children with hearing impairments would be identified earlier and referred for appropriate remedial or treatment services with minimal delay.

It should be made clear that the employment of this “rapid screening procedure” is in no way mandatory and its acceptance and use is completely at the option of the school. The success of this procedure or program depends entirely upon the cooperation of the school administrators, teachers, nurses, and speech and hearing therapists.

- a. Begin testing in the right ear. Set the frequency dial at 1000 Hz and the hearing loss dial at 55 dB. Turn the tone “on” briefly and then “off”. After the child responds, turn the hearing loss dial to 40 dB; test the tone once. Turn the hearing loss dial to 25 dB; test this tone. If the child responds, this means that he passes the test for this tone. If he does not respond, he fails the test for this tone.
- b. Leave the hearing loss dial set at 25 dB for the rest of the test on the child.
- c. Change the frequency dial to 2000 Hz and test this tone. Repeat this procedure until all the following tones have been tested in the right ear: 250, 500, 1000, 2000, and 4000 Hz. Repeat the procedure in the left ear.
- d. Do all the Sweep-Check tests before doing any retests.

- e. Record the test results for each child on the child's School Health Record.

2. Results of Sweep-Check Test

A child not hearing two or more tones at 25 dB in one or both ears should be given a threshold test that day or within one month.

B. Pure Tone Threshold Test

1. Pupils Requiring Threshold Testing

- a. Pupils failing the Sweep-Check Test (i.e., not hearing two or more tones at 25 dB in one or both ears) should be threshold tested within a month following the original test.
- b. All pupils, regardless of grade, whose previous hearing test has shown a loss which meets or exceeds the criteria for otologic referral. (Test annually.)
- c. All pupils, regardless of grade, whose classroom behavior and/or speech pattern suggests possible hearing difficulty.
- d. All pupils who present a history of recurrent upper respiratory infection or who may evidence other possible ear, nose, and throat pathology.

2. Pure-Tone Threshold Hearing Testing Procedure

- a. Begin the testing in the right ear. Set the frequency dial at 1000 Hz and the hearing loss dial at about 50 dB. Turn the tone "on" briefly, then turn "off". If the child hears this tone, set the hearing loss dial (while the tone is off) at 40 dB, and repeat this procedure, decreasing the hearing loss dial by 10 dB steps until the child no longer indicates that he hears. Then, increase the hearing loss dial by 5 dB steps until he does hear the tone again.

Alternately decrease and increase the tone in 5 dB steps until, finally, the point or level below which he cannot hear is determined.

This is his threshold for the particular tone. Record this on the School Health Record and Parent/Guardian Notification form (Appendix C).

- b. Repeat this same procedure until the following tones have been tested in the right ear: 250, 500, 1000, 2000, 4000, and 8000 Hz. Use this same procedure in the left ear.
- c. Record results on pupil's School Health Record and Parent/Guardian Notification form (Appendix C).

3. Results of Pure Tone Threshold Hearing Test

A child whose threshold test shows a hearing level of 30 dB or more for two or more tones in one or both ears, or 35 dB or more for one tone in either ear, shall be referred for a complete ear examination. (A complete ear examination means otologic assessment and audiometric tests.)

XII. PROCEDURES FOR REFERRAL, FOLLLOW-THROUGH, AND CASE MANAGEMENT – SCHOOL NURSE/SCHOOL NURSE PRACTITIONER RESPONSIBILITES

School nurses/school nurse practitioners are responsible for referring any pupil found to have failed the threshold test for further evaluation. Referrals should be made by personal contact with a parent, followed by written notification using Parent/Guardian Notification (Appendix C). Report from the physician or the hearing specialist should be completed on the Physician/Hearing Specialist Report (Appendix C) and returned to the school nurse.

“Island” Hearing Losses

Children who by virtue of school hearing screening and threshold testing are found to have a hearing loss of 35dB or more only at 4000Hz or 8000Hz in either ear and normal hearing at all other frequencies shall not be referred immediately for a complete ear examination as has been formerly directed.

Such children shall be retested by nurses a number of times over a three to six month period. If at any time the audiometric retest results reveal a 15 dB change (worsening) of hearing in those children where an “island” loss at 4000Hz or 8000Hz was the only hearing loss initially detected, then refer those children for complete ear examination in accordance with established procedure. In such instances, copies of all audiograms conducted over time – and clearly dated – shall be forwarded to each child’s family physician and/or examining otolaryngologist.

In cases where no worsening of hearing at 4000Hz or 8000Hz is detected after three to six months of retesting, audiometric monitoring should continue on a yearly basis.

A. Procedures for Referral of Children for Complete Ear Examination

There is increasing evidence that pupils failing the threshold hearing test are not being referred for complete ear examinations. Cases have been identified where serious hearing loss had been documented and there were no referrals made for complete ear examinations; thus, the pupil remained untreated and suffered emotionally and academically.

Any child attending a public or non-public school in Pennsylvania, who by virtue of his/her hearing threshold test results obtained by the school nurse is found to be in need of a complete ear examination, is to be referred to the family’s physician or usual source of care (which may include the otologist) for medical evaluation. The family is responsible for arranging this examination.

In the event the family requires financial assistance in obtaining the examination through the Department of Health's Hearing Services Program, the school nurse may provide the family with the toll-free telephone number (1-800-986-4550 or 1-800-986-KIDS) to obtain an Application For Services Packet.

B. Diagnostic Services

Children with ear disease or suspected hearing disorders ages 5 to 16 years and those 16 to 21 years of age who are not eligible for services through the Office of Vocational Rehabilitation may be eligible for diagnostic services through the Department of Health's Hearing Services Program. These services are available through providers that have a participating provider agreement with the Department. Whenever there is a third-party payor, including insurance, Childrens Health Insurance Program (CHIP), or Medical Assistance, every effort shall be made to utilize these resources. Limited diagnostic services are available according to the Department's fee for services schedule.

C. Treatment Services

Medical treatment, inpatient and outpatient surgery, and hospital care are available to children through the Department of Health's Hearing Services Program if the family is determined to be financially eligible for treatment services. These services are available through Providers that have a Participating Provider agreement with the Department. Private insurance and medical assistance are always applied to the cost of inpatient services. The purchase and repair of hearing aids are also considered treatment services. Families are expected to share in the cost of treatment services when financially able to do so.

D. Follow-Through

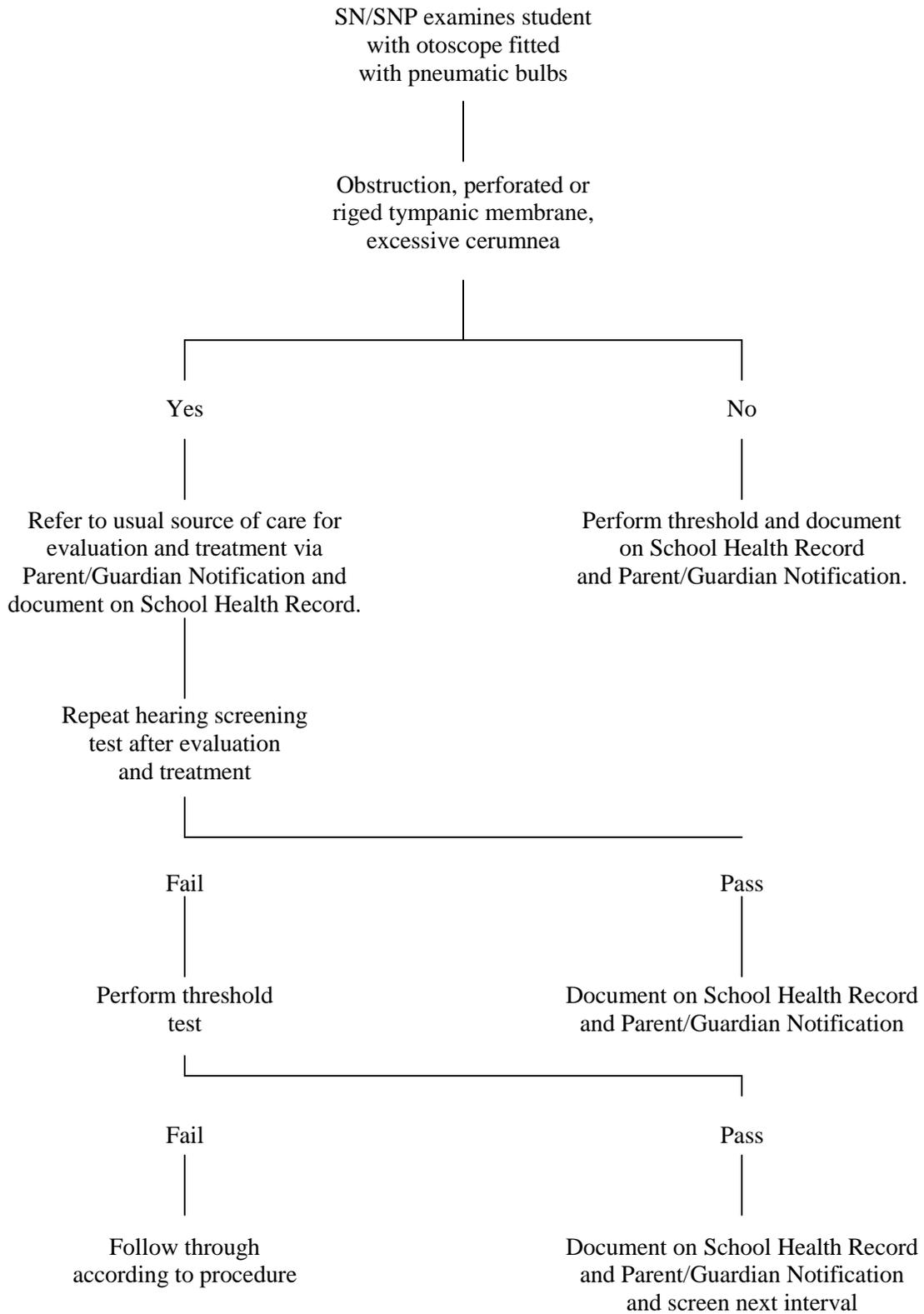
In those cases where a significant degree of hearing impairment remains after appropriate medical treatment has been accomplished, the school nurse, in consultation with the physician, shall arrange for indicated professional evaluations necessary for proper case management.

Information pertinent to the proper placement of the student shall be made available to appropriate school personnel. In instances where medical intervention has failed to restore hearing completely, the school multidisciplinary (IEP) team should plan educational placement for the student following federal P.L. (94-142) and state laws and guidelines. It is appropriate for the school nurse/school nurse practitioner to convey/make recommendations to the committee and to the teacher for classroom modifications to meet the student's needs.

Those students who have hearing impairments classified as mild or moderate (15 dB to 50 dB) may need classroom seating arrangements to enable them to function more effectively in class. Examples of seating adjustment could be seating the pupil in front of the room with the unimpaired ear toward the class, or making sure that the pupil is able to see the teacher's lips when instruction is given. Those with severe loss (70 to 90 dB) may need special classes where they may learn and use speech reading and/or sign language. Students wearing hearing aids may need special classes or special assistance to learn to adjust and use an aid. Regardless of the diagnosis, treatment, or classroom placement of pupils with hearing loss, it is the responsibility of the school nurse to become an advocate for the student with hearing impairment.³

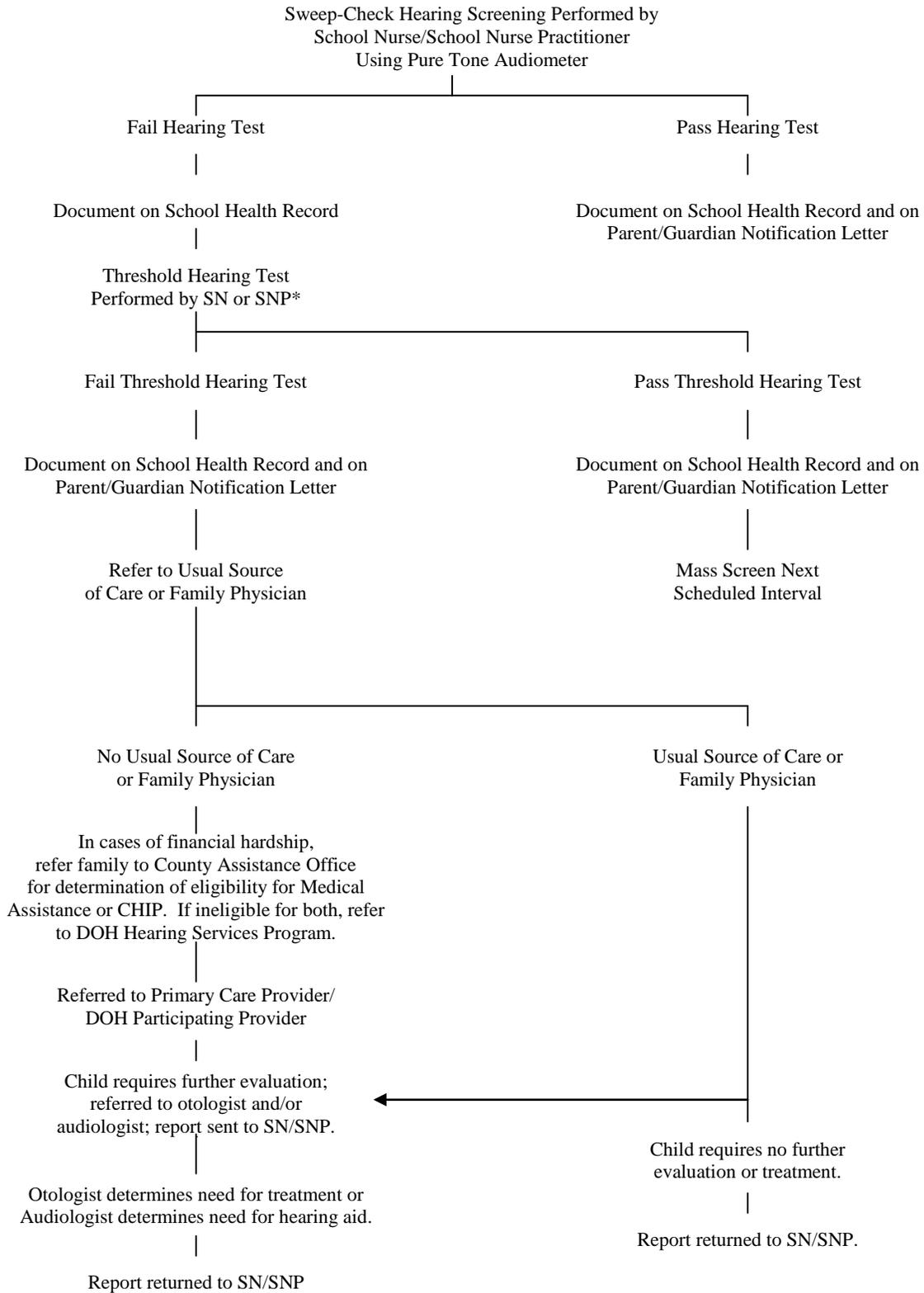
³ Hearing Screening Guidelines, p. 32

Follow through for
students failing Sweep Check test



REFERRAL AND FOLLOW-THROUGH PROCEDURE FOR HEARING
SCREENING PROGRAM FOR SCHOOL-AGE CHILDREN IN PENNSYLVANIA

Key: SN – School Nurse
SNP – School Nurse Practitioner



*Do as soon as possible, at least within one month.

XIII. HEARING AIDS

A hearing aid does not restore one's hearing. It amplifies all sounds, not just speech and language. A hearing aid is part of the total habilitation process.

A. Kinds of Hearing Aids

There are only two kinds of hearing aids:

1. Air Conduction

This kind of hearing aid transmits sound by air into the ear via the earmold.

2. Bone Conduction

This kind of hearing aid requires a headband with an oscillator. No earmold is required and the oscillator is placed behind the ear on the mastoid area. The signal is transmitted by bone.

B. Types of Hearing Aids

1. Body Hearing Aid

An amplification unit worn on the chest, equipped with a cord and receive button which is attached to an earmold worn in the ear.

2. Behind-the-Ear (BTE)

A small amplification unit with built-in-microphone and receiver worn behind or over the ear with a short plastic tube connecting it to the ear mold in the ear.

3. Eyeglass Hearing Aid

A behind-the-ear hearing aid built into the temple piece of eyeglasses with plastic tubing connected to the earmold.

4. In-the-Ear (ITE)

A very small amplifying unit inserted in the mold and worn entirely in the ear.

5. Canal Aid

A smaller unit worn and contained entirely in the canal of the ear.

C. Loaner Hearing Aids

“Loaners” are recommended when a pupil must be without his/her aid for an extended period of time during repair.

Possible sources where “Loaners” may be obtained are:

1. Hearing Aid Dispensers (preferably where secured).
2. Intermediate Units (contact Supervisor for Hearing Impaired).
3. Local organizations/agencies who support Hearing Aid Banks.

Loaner hearing aids obtained from dispensers should be on a short term basis. Loaner hearing aids from Intermediate Units are normally available only for use in school for a period of three months or less. Criteria for loaner hearing aids from local sources vary and should be understood before use.

D. Maintenance of Hearing Aids

Because a defective hearing aid may prevent the wearer from functioning at optimal levels, it is very important that the hearing aid check be performed by parents, audiologists, teachers, or nurses on a routine basis. Hearing aids should be checked for battery function (a spare pack of batteries should be kept in school); condition of the earmold (cracks, bubbles in the vent, too tight, too loose, etc.); broken cords or tubing (crackling sounds, static, feedback problems); external examination (loose hook, clips missing, battery door, cracked case, etc.); and internal function (volume control, off/on switch, intermittent sound, or no sound). Concerns about the inadequacy of a hearing aid should be brought to the attention of the Supervisor of the Hearing Impaired in the Intermediate Unit or his/her designated representative.

XIV. POSITION STATEMENT REGARDING IMPEDANCE TESTING IN THE SCHOOLS

Tympanometry: An Objective Measurement of the Mobility of the Tympanic Membrane

Although the value of impedance testing (tympanometry) is widely recognized, such tests are not to be regarded as a measurement of hearing acuity, nor a substitute for pure tone audiometry. As an objective measurement of the mobility of the tympanic membrane, tympanometry – when conducted by trained, experienced personnel – can reliably detect pathological conditions of the middle ear. Pure tone audiometry (screening and threshold tests) is a subjective test of hearing acuity in that it identifies the level at which a subject reports hearing pure tone stimuli presented at different intensities and frequencies.

It is well known that a child may “pass” a pure tone screening test, yet have ear disease or pathology which might minimally affect hearing acuity at the time, but which could seriously threaten the hearing and general health of that individual if the condition is not identified and medically remediated. Conversely, a child could have a severe to profound hearing loss, yet impedance results might well reveal a normal tympanogram.

The School Health Hearing Screening and Threshold Testing Program was established to identify not only those children with hearing impairment but also children with ear disease or conditions which might lead to hearing impairment, if not detected and treated, or which might exacerbate an existing hearing disorder. Ideally, to fulfill this mission effectively in light of present day technology, impedance testing and audiometric testing should be prescribed for use in the schools. Realistically, however, because of the constraints on funds, professional staff, nursing time, and other necessary support resources, it is not feasible to undertake a major program change at this time.

Nevertheless, of particular concern to the Division of School Health and to the Hearing Services Program, are those school children in special classes and those who, for other reasons, are untestable by pure tone audiometry. This population, according to various studies conducted across the United States, has a higher incidence of middle ear pathologies than other school children. It therefore seems reasonable to declare that impedance testing, and subsequent referral of these children to obtain diagnostic otological and audiological evaluations, be permissible under certain conditions.

The following guidelines and standards shall be used in the tympanometric testing, follow-up, and referral of school children who cannot be tested by pure tone audiometry.

A. General Guidelines and Standards

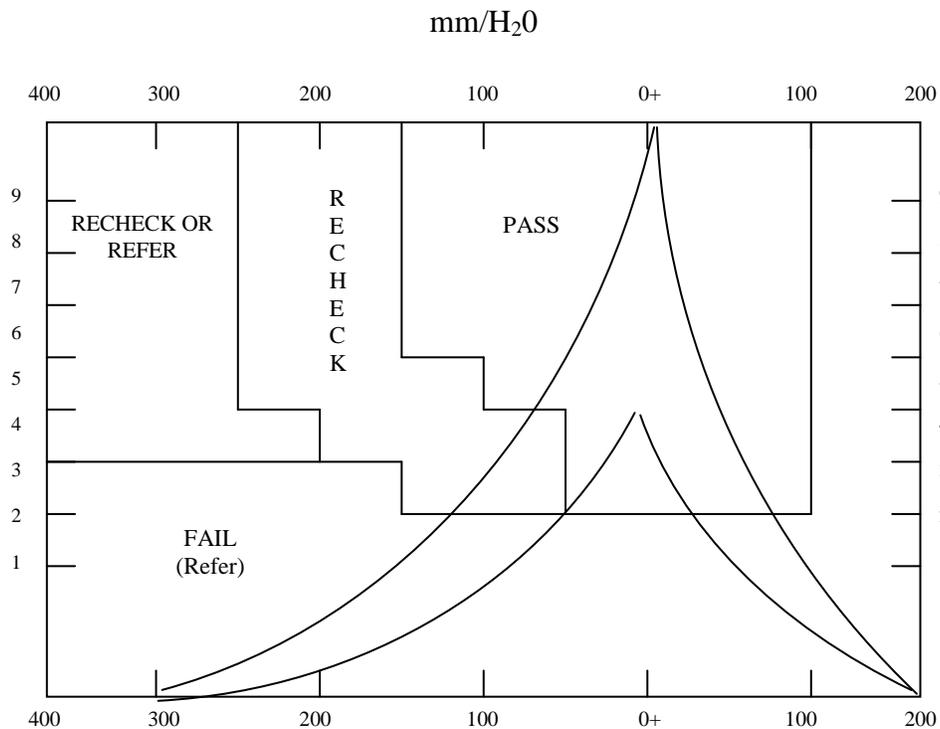
1. Impedance testing is not required for these children, but is permissible.
2. The cost of procuring and maintaining impedance measurement devices (tympanometers) are not to be considered reimbursable items under the Public School Code of 1949.
3. Audiologists in the I.U.'s and school districts are the only personnel qualified to administer and interpret tympanometric tests and results.

B. Pass-Fail-Recheck-Referral Criteria

All children with ear canal volumes that are abnormal are to be referred.

Rechecks are to be done two (2) weeks after screening.

Type B tympanograms and abnormal canal volumes are to be referred without rechecking.



XV. RECOMMENDATIONS FOR ORIENTATION TO HEARING SCREENING PROGRAMS AND CONTINUING IN-SERVICE EDUCATION FOR SCHOOL NURSES

All newly employed school nurses should be oriented to the School Hearing Screening Program. It is highly desirable that in-service training programs for school nurses be held annually. Such in-service programs might be planned on a regional basis to include several school districts and/or Intermediate Units depending upon the number of school nurses employed within such geographic areas. The in-service programs would serve to update current school nursing staff on such topics as:

- (1) Audiometric tests and techniques.
- (2) Audiometer maintenance and calibration.
- (3) Audiogram interpretation.
- (4) Review of regulations and policies pertaining to hearing screening and threshold testing of school children.
- (5) Procedures for referral of hearing impaired children for medical and audiological follow-up.
- (6) Medical, audiological, and educational implications for hearing impairments of various types and severities.
- (7) Community resources for supplemental referrals.

Speech and hearing personnel employed by the schools or Intermediate Units may be of assistance in arranging for such in-service training programs.

Also, the Department of Health may be of assistance at:

Division of School Health
Pennsylvania Department of Health
Post Office Box 90
Harrisburg, Pennsylvania 17108

Phone: (717) 787-2390

XVI. REPORTING

Every school district shall submit to the Pennsylvania Department of Health aggregate information regarding the hearing screening program as specified in the Instruction Manual for the "Request for Reimbursement and Report of School Health Services" due September 30.

XVII. RESOURCES

- 1) American Speech-Language-Hearing Association
10801 Rockville Pike
Rockville, MD 20852
Toll-free, voice, or TTY: 1-800-638-8255
E-mail: actioncenter@asha.org

- 2) Pennsylvania Training & Technical Assistance Network

Pittsburgh Office:

5347 William Flynn Highway
Gibsonia, PA 15044
(724) 443-7821
(800) 446-5607 in PA only
www.pattan.k12.pa.us

Harrisburg Office:

6340 Flank Drive, Suite 600
Harrisburg, PA 17112
(717) 561-4960
(800) 360-7282 in PA only
www.pattan.k12.pa.us

King of Prussia Office:

200 Anderson Road
King Of Prussia, PA 19406
(610) 265-7321
(800) 441-3215 in PA only
www.pattan.k12.pa.us

XVIII. DEFINITION OF TERMS

<u>Ameslan</u>	--American Sign Language.
<u>ANSI</u>	--Acoustical standards used to calibrate audiometry established by American National Standards Institute.
<u>Audiogram</u>	--The record of the results of a test using an audiometer.
<u>Audiological Assessment</u>	--A complete test of auditory function involving special auditory tests.
<u>Audiologist</u>	--A master's degree professional trained in testing for auditory dysfunction who prescribes a proathetic device and aural habitation measures to assist communication.
<u>Audiometer</u>	--An electronic instrument for measuring hearing acuity. A pure tone audiometer or other screening equipment approved by the Department of Health and supplied by the local school authorities shall be utilized in the schools of Pennsylvania.
<u>Aural Rehabilitation Therapy</u>	--Use of an individual's residual hearing either with or without application.
<u>Biological Check</u>	--A process where the Tester tests his/her Hearing Level to detect frequency or shift or problems with the audiometer.
<u>BSER</u>	--Brain Stem Evoked Response.
<u>Calibration</u>	--The process of changing the audiometer output by means of internal repairs; this process is accomplished by the audiometer manufacturer or an established repair laboratory. An electrical check to determine if the audiometer is within acoustic standards.
<u>Complete Ear Examination</u>	--An otologic assessment and audiometric tests.
<u>dB</u>	--An abbreviation for DeciBel.

<u>DeciBel</u>	--(or dB) is the unit of measurement of sound intensity.
<u>Department</u>	--Pennsylvania Department of Health
<u>Dispenser</u>	--An individual or corporate body that issues products for the State upon receipt of an authorization of services.
<u>Frequency of Tone</u>	--The number of double vibrations or Hertz which make up that tone. The full range of frequencies that the human hears is about 20 to 20,000 Hertz. The speech range is about 250 through 4,000 Hz.
<u>Hearing Aid Evaluation</u>	--A complete evaluation of different hearing aids to determine benefits of and recommendations for amplification.
<u>Hearing Therapist</u>	--A professionally trained individual who provides therapy to hearing impaired people.
<u>Hertz</u>	--(or Hz) is the unit of measurement of sound frequency.
<u>Hz</u>	--An abbreviation for Hertz.
<u>Interpreter</u>	--A skilled individual in a foreign/sign language who can both send and receive information in both.
<u>Loaner Hearing Aids</u>	--Temporary use of a hearing aid not specifically recommended for that individual to provide continual assistance with communication.
<u>Non-Provider</u>	--An individual or corporate body who provides authorized services on an infrequent basis due to special need.
<u>Otolaryngologist</u>	--Physician having additional training to diagnose and treat ear disease and Eustachian tube dysfunction; a medical specialist in ear, nose, throat pathology.
<u>Provider</u>	--An individual or corporate body who provides initial services on a regular basis and continual services upon authorization.

<u>Pure Tone</u>	--A sound of a specific frequency produced by an audiometer.
<u>Speech Pathologist</u>	--A master's degree professional trained in testing and therapeutic procedures involving human communications problems.
<u>Sweep-Check</u>	--The procedure of "sweeping" through the various frequencies on an audiometer. This is described in the paragraph on testing technique.
<u>Threshold</u>	--The lowest dB level at which a person responds to a tone at least half of the time.
<u>Tone Interrupter</u>	--The switch on the audiometer which turns the tone "ON" and "OFF".

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**PENNSYLVANIA
PUBLIC
SCHOOL
CODE
OF 1949**

**ACT OF 1949, P.L. 30, NO. 14
REVISED JANUARY 1993**

§ 1402. Health Services

- (a) Each child of school age shall be given, by methods established by the Advisory Health Board – (2) a hearing test by a school nurse or medical technician.

Commonwealth of Pennsylvania
Pennsylvania Code

Title 28. Health and Safety

Department of Health
Health Care Cost Containment Council



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PART III. PREVENTION OF DISEASES

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**CHAPTER 21
[Reserved]**

CHAPTER 23. SCHOOL HEALTH

Subchap.		Sec.
A.	GENERAL PROVISIONS.....	23.1
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C.	IMMUNIZATION	23.81

Cross References

This chapter cited in 22 Pa. Code § 7.13 (relating to health services).

Subchapter A. GENERAL PROVISIONS

HEALTH SERVICES

Sec.	
23.1.	Required health services.
23.2.	Medical examinations.
23.3.	Dental examinations.
23.4.	Vision screening tests.
23.5.	Hearing screening tests.
23.6.	Threshold hearing tests.
23.7.	Height and weight measurements.
23.8.	Maintenance of medical and dental records.
23.9.	Tuberculosis tests.
23.10.	Scoliosis screening.
23.11.	Special examinations.

§ 23.5. Hearing screening tests.

(a) *Identity.* A hearing screening test determines the response to discrete frequencies presented at a specified decibel level.

(b) *Test equipment.* An individual pure tone audiometer or other screening equipment approved by the Department of Health shall be utilized for hearing screening tests.

(c) *Frequencies employed.* Frequencies of 250, 500, 1,000, 2,000 and 4,000 cycles per second shall be employed in screening testing.

(d) *Pupils to be tested.* Each year, pupils in kindergarten, special ungraded classes and grades one, two, three, seven and 11 shall be given a hearing screening test.

Cross References

This section cited in 28 Pa. Code § 23.6 (relating to threshold hearing tests); and 28 Pa. Code § 23.21 (relating to general).

§ 23.6. Threshold hearing tests.

(a) *Identity.* A threshold hearing test determines the lowest decibel level required to elicit responses, at least 50% of the time, to a series of discrete frequencies.

(b) *Test equipment.* An individual pure tone audiometer or other screening equipment approved by the Department of Health shall be utilized for threshold hearing tests.

(c) *Frequencies employed.* Frequencies of 250, 500, 1,000, 2,000, 4,000 and 8,000 cycles per second shall be employed in threshold testing.

(d) *Pupils to be tested.* The following pupils shall be given threshold hearing tests:

(1) A pupil in any grade who is known to have a loss which meets or exceeds the criteria for otologic referral established by the Department of Health shall be given a test each year.

(2) A pupil who fails a hearing screening test given under § 23.5 (relating to hearing screening tests).

(3) A pupil who presents a history of recurrent upper respiratory infection or may evidence other possible ear, nose and throat pathology.

(4) A pupil who shows, by classroom behavior or speech pattern, or both, that a hearing difficulty may exist.

Cross References

This section cited in 28 Pa. Code § 23.21 (relating to general).

APPENDIX C

PARENT/GUARDIAN NOTIFICATION

Date: _____

Name: _____

Address: _____

Dear _____:

_____ did not pass the hearing test given at
(Name of Child)

_____ on _____
(Name of School) (Date)

Results of Threshold Hearing Tests

DATE OF EXAM	RIGHT EAR						LEFT EAR						PASS (P) OR FAIL (F)	
	250	500	1000	2000	4000	8000	250	500	1000	2000	4000	8000		

The hearing test, as given in the school, is a screening test, and failure of this hearing screening test indicates only that the child should have a more complete ear examination.

It is recommended that he/she have a complete diagnostic ear examination by a physician. This is to include an audiogram.

Please request that the physician complete the other side of this letter. You are requested to sign and return this completed form to me.

Sincerely yours,

(School Nurse's Signature)

(School Nurse's Address)

(Telephone)

PHYSICIAN/HEARING SPECIALIST REPORT

Child's Name: _____

Age: _____

Address: _____

Grade: _____

School: _____

Results of Threshold Hearing Tests

DATE OF EXAM	RIGHT EAR						LEFT EAR						PASS (P) OR FAIL (F)	
	250	500	1000	2000	4000	8000	250	500	1000	2000	4000	8000		

Physician's Audiogram Attached? _____ Yes _____ No

Tentative Diagnosis: _____

Type of Hearing Loss: _____

Prognosis: _____

Recommendations: _____

(Physician's Signature) (Date)

(Address)

(Telephone)

(Parent's Signature) (Date)

(Address)

(Telephone)