



**PROFESSIONAL BOARD FOR SPEECH, LANGUAGE AND  
HEARING PROFESSIONS**

**MINIMUM STANDARDS FOR THE HEARING  
SCREENING IN SCHOOLS**

**OCTOBER 2018**

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## **A. PREAMBLE**

The Board for Speech, Language and Hearing Professions the HPCSA recommends minimum standards for hearing screening of the school age population. These minimum standards cover training, roles and responsibilities, appropriate test environments, equipment, procedures as well as the legal and ethical requirements in the delivery of audiology services.

These minimum standards describe requirements for a well-organized hearing screening programme conducted by properly trained personnel who will ensure: (i) correct environment for screening; (ii) appropriate hygiene standards; (iii) availability and correct use of equipment; (iv) standardized testing procedures being followed; (v) accurate record keeping; (vi) appropriate and timeous feedback; (vii) referrals, and (viii) follow up.

## **B. TERMINOLOGY**

‘Cerumen’	The waxy secretion of the ceruminous glands in the external auditory meatus; ear wax (Stach, 2003, p. 52).
‘Refer’	When the audiological screening result indicates "Refer," it may indicate that the patient is at risk for hearing impairment and requires diagnostic assessment

## **C GOAL OF HEARING SCREENING IN SCHOOLS**

The goal of hearing screening in schools it to timeously detect, identify and refer school age children for management of hearing impairment and ear pathology.

## **D. PRINCIPLES OF HEARING SCREENING IN SCHOOLS**

The following principles are the foundation for effective and accountable hearing screening programmes in schools.

1. Hearing screening services/programmes should be integrated and coordinated with other services focusing on the same population.
2. All school aged learners should be afforded access to hearing screening services once during each of the four educational phases (Foundation phase - Gr R-3; Intermediate phase - Gr 4-6; Senior phase – Gr 7-9; and Further Education and Training – Gr 10-12) (ISHP, 2012).

Screening should also be offered to learners (i) at risk for academic failure or who are repeating a grade; (ii) with parent/teacher concerns regarding hearing, speech, language or learning ability; (iii) with previous or ongoing ear pathology; and (iv) who request hearing screening (self-referral).

3. Hearing screening should only be performed by suitably trained personnel.
4. Screening results and recommendations should be communicated to parents/guardians.

5. Accurate screening records should be kept and results into an information database to provide data for service planning, audit and quality assurance.

## B. ROLES AND RESPONSIBILITIES

Audiologist:

1. Develop and manage the hearing screening programme.
2. Manage hearing screening referrals
3. Monitoring of compliance with minimum standards
4. Quality assurance of programme (i.e. training of hearing screening personnel, ensuring that all tests and procedures undertaken by trained staff are appropriate).
5. Create and maintain a database

### **Hearing screening Personnel**

Examples include audiologists, speech language therapists, school health nurses, audiology technicians, CHW, trained volunteers:

Adherence to standard hearing screening protocols

### **Educators**

Ensuring signed informed consent by parents and disseminating screening results to parents.

### **School Management**

Ensure coordination and monitor follow up

## G. GUIDELINES

### **1. Scheduling**

Prior to conducting hearing screening there should be identification of referral pathways and accessible referral facilities for assessment and management.

Ensure the venue to be used meets the requirement for ambient noise levels.

### **2. Informed consent**

Informed consent must be obtained. from parent/guardian. Learner is above the age of 13 years are able to consent to receive medical treatment (i.e. hearing screening).

The consent form should include all relevant information (e.g. date, time, rationale and procedures) with the relevant costs involved (if any) and specify that screening is not mandatory. (See Appendix

A).

### 3. Screening Protocol

*Adapted from the Minnesota Department of Health Hearing Screening Training Manual (2014)*

- a. Required screening procedures should include visual inspection of the outer and middle ear as well as pure tone air conduction audiometry. Optional screening procedures may include OAEs.
- b. Algorithm protocol A or B as indicated in Appendix G and H can be used.

#### 3.1 Infection control

Universal precautions should be adhered to throughout screening. Routine precautions include:

- Washing of hands before and after handling a learner.
- Surfaces such as headphones and conditioned play objects used during screening should be cleaned and disinfected after each use.
- Non-disposable consumables (speculae, probe tips, etc.) should be cleaned and disinfected after use.
- Gloves should be used in cases of ear drainage, blood, sores, or lesions (on the scalp); or when the screener’s or child’s skin is broken. They should also be used for cleaning or disinfecting instruments contaminated with cerumen.
- Disposable items should be directly disposed of in clinical waste bags after use.

#### 3.2 Environmental noise level check

<b>Purpose</b>	To ensure that the environment is quiet enough to perform pure tone screening (< 40dBA). This is performed in lieu of performing ambient noise level measurements using a sound level meter.
<b>Description</b>	Perform pure tone audiometry threshold screening on another person with known normal hearing.
<b>Equipment</b>	Pure tone audiometer
<b>Facilities</b>	Quiet room free from visual distractions where you are planning to perform hearing screening
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. Establish thresholds at 10 dB below the screening level (i.e. 20 dB at 500 Hz; 15 dB at 1000, 2000 and 4000 Hz)</li> <li>2. Do not use the area for screening if a person with normal hearing is unable to detect the sounds at these intensities.</li> <li>3. If the only frequency not audible in the screening environment is 500 Hz, then omit the 500 Hz level from the day's screening protocol.</li> <li>4. Record the findings of the biologic calibration check form (Appendix B)</li> </ol>
<b>Considerations</b>	<p>The screener should maintain awareness of noise level throughout the screening procedure and avoid excess noise within the screening area including talking, paper shuffling and movement of desks and furniture. Keep the screening room uncluttered and free of visual distractions. Also avoid areas near:</p> <ul style="list-style-type: none"> <li>• Fans or air conditioners</li> <li>• Hall traffic (reroute if possible)</li> <li>• Playground or street traffic</li> <li>• Group activities (i.e. music, free play)</li> </ul>

	<ul style="list-style-type: none"> <li>• Bathrooms</li> <li>• Office equipment (i.e. copy machines)</li> <li>• Open windows</li> <li>• Refrigerators</li> </ul>
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### 3.3 Otoscopy

<b>Ages</b>	All
<b>Purpose</b>	To check for impacted cerumen and signs of ear disease
<b>Description</b>	A systematic inspection of the external ear, external ear canal, and tympanic membrane
<b>Equipment</b>	Otoscope
<b>Procedure: External inspection</b>	<ul style="list-style-type: none"> <li>• Identity the child by name</li> <li>• Explain the procedure</li> <li>• Inspect the pinna and the area around it for any abnormalities such as skin tags, or atresia</li> <li>• Check for position (set or tilt) of the ears</li> <li>• Check for impacted cerumen</li> <li>• Check for tenderness, redness or oedema, signs of drainage, foul odour, or dermatitis</li> </ul>
<b>Procedure: Internal inspection</b>	<p>With the otoscope, inspect the ear canal and tympanic membrane for:</p> <ul style="list-style-type: none"> <li>• Signs of drainage, wax build up, foreign bodies, redness of the ear canal, ventilation tubes (grommets), and other abnormalities</li> <li>• Note presence or absence of normal tympanic membrane landmarks</li> </ul>
<b>Pass criteria</b>	Children with normal appearance of all structures and no complaints of pain
<b>Refer criteria</b>	<ul style="list-style-type: none"> <li>• Refer children with any abnormality</li> <li>• Do not proceed with audiometric screening if tenderness, signs of drainage, foul odour or impacted wax is present; this should be an automatic referral.</li> </ul>

### 3.4 Pure Tone Screening

Ensure a listening check of the audiometer is conducted prior to testing.

<b>Ages</b>	All school-going children
<b>Purpose</b>	To identify children with suspected hearing impairment.
<b>Description</b>	A standard series of pure tones at set intensities (measured in decibels [dB]) presented to the child using pure tone audiometry.
<b>Equipment</b>	<p>Option 1: Pure tone audiometer</p> <p>Option 2: Semi-automated pure-tone screening devices</p> <p>Audiometers should meet the performance and calibration requirements of ANSI 83.6 – 2010</p>
<b>Facilities</b>	Quiet room free from visual distractions
<b>Procedure for conditioning</b>	<ol style="list-style-type: none"> <li>1. Identify the child by name</li> <li>2. Explain the procedure</li> <li>3. Avoid using the term fail when speaking to the child</li> <li>4. Position the child so they are facing away from the tester.</li> </ol>

	<p><i>Option 1- Pure tone audiometer:</i></p> <ol style="list-style-type: none"> <li>5. Lay headphones on the table, facing the child. Set audiometer to 2000 Hz and maximum dB level, and have the child practice raising either hand /saying yes when a tone is heard. This is only for conditioning purposes. Refer any child who is unable to hear the tone at maximum volume to their nearest audiologist for diagnostic testing.</li> <li>6. Set decibel dial to 40 dB and frequency dial to 1000 Hz.</li> <li>7. Place the red headphone on the child’s right ear and the blue headphone on the left ear and ensure the headphones fit snugly on the child’s head.</li> </ol> <p><i>Option 2: As per equipment instructions</i></p>
<b>Screening</b>	<p>Option 1:</p> <ol style="list-style-type: none"> <li>1. Set selector switch to “Right” and present 40 dB at 1000 Hz.</li> <li>2. Turn dial to 25 dB and present tones at 1000, 2000, and 4000 Hz.</li> <li>3. Turn selector switch to “Left” and present tones at 4000, 2000, and 1000 Hz.</li> <li>4. Set dial to 30 dB and present tone at 500 Hz*; next, turn selector switch to “Right” and present tone at 500 Hz*.</li> <li>5. Present tones for one to two seconds; you may present the tone twice consecutively (but no more than 4 times) if needed for each screening frequency.</li> <li>6. Document screening results (See Appendix C)</li> </ol> <p>*The 500 Hz tone may be eliminated when the environmental noise level is too high.</p> <p>Option 2: As per equipment instructions</p>
<b>Considerations</b>	<ul style="list-style-type: none"> <li>• Pure tone audiometry screening should take place in a very quiet room without visual distractions.</li> <li>• Pause the screening if any distracting noise occurs.</li> <li>• If the child does not appear to understand the directions, stop, take the head phones off, and reinstruct the child.</li> <li>• If the child did not hear the tones at one or more frequency in either ear, rescreen by repeating the entire pure tone series (Refer to G 4.9).</li> <li>• If the child is unable to be screened due to issues such as behaviour or equipment malfunction, stop and document “unable to screen.”</li> <li>• For children who are difficult to screen play audiometry or OAEs can be performed.</li> </ul>
<b>Pass criteria</b>	The child responds in each ear to each frequency at the following intensities 30 dB at 500 Hz; 25 dB at 1000, 2000, and 4000 Hz
<b>Rescreen criteria</b>	If the child does not respond to one or more frequency (specified above) in either ear. The rescreen should occur immediately on the same day. Headphones must be removed, the child must be reinstructed and then rescreened.
<b>Refer criteria</b>	If the child does not respond to one or more frequency (specified above) in either ear after rescreen refer the child to an audiologist for a diagnostic hearing assessment.

## Pure Tone Screening (Play Audiometry)

<b>Ages</b>	Children who are difficult to screen.
<b>Purpose</b>	To identify children with suspected hearing impairment.
<b>Description</b>	Play audiometry is a modification of standard pure tone screening; it conditions the child to respond to the sound by using other response modes (other than raising their hand) e.g. placing a toy in a container
<b>Equipment</b>	Pure tone audiometer, appropriate size table and chairs, and small child-safe toys (such as animals, airplanes, cars, plastic toy bucket, nested boxes, or pegs and pegboard)
<b>Facilities</b>	Quiet room free from visual and other distractions.
<b>Procedure for conditioning</b>	<ol style="list-style-type: none"> <li>1. First, practice without the headphones on.</li> <li>2. Lay headphones on the table, facing the child, with audiometer set at 2000 Hz and maximum dB level to ensure tone is audible.</li> <li>3. Hold the toy near your ear; assume a “listening” attitude and present tone.</li> <li>4. Indicate through facial expression the sound was heard and then drop the toy in a container, such as a plastic toy bucket; repeat as often as necessary until the child shows interest.</li> <li>5. Offer the toy to the child and place your hand on theirs to guide the first responses; encourage the child to wait until they hear the sound.</li> <li>6. When the child appears ready, present the sound and guide the child’s hand to put the toy in the container.</li> <li>7. The child may give consistent responses after only one demonstration or may need several demonstrations to respond on their own.</li> </ol>
<b>Screening</b>	<ol style="list-style-type: none"> <li>1. Once the child understands the play audiometry technique use the audiometric procedure as described in the pure tone audiometry screening section.</li> <li>2. Reward the child with praise after initial responses. If this is not effective, a tangible reward like a sticker may be given.</li> <li>3. If the child still is unable to do the screening after re-instruction, stop and conduct OAE screening (if available).</li> <li>4. If OAE not available, then document as “unable to screen”</li> <li>5. Refer for a diagnostic assessment</li> </ol>
<b>Considerations</b>	<ul style="list-style-type: none"> <li>• Adaptations should be made according to the child’s needs</li> <li>• The tone-to-response time varies between children; some children will drop the toy as soon as they hear the tone; others will wait until the sound goes off before dropping the toy.</li> <li>• If the child does not accept the headphones, the screener should try putting them on for only one or two seconds, removing and rewarding the child. Slowly increase the time with the headphones on.</li> <li>• A timid child will often benefit from watching other children successfully complete the screening.</li> <li>• Using an assistant during screening can assist with obtaining responses from the child.</li> <li>• If the child is unable to be screened, refer.</li> </ul>

<b>Pass criteria</b>	A child who responds to all four tones in each ear (30dB at 500 Hz; 25dB at 1000, 2000, and 4000 Hz) does not require rescreening or referral.
<b>Rescreen criteria</b>	If the child does not respond to one or more frequency (specified above) in either ear. The rescreen should occur immediately on the same day. Headphones must be removed, the child must be re-conditioned and then rescreened.
<b>Refer criteria</b>	If the child does not respond to one or more frequency (specified above) in either ear after rescreen, refer the child to an audiologist for a diagnostic hearing assessment.

### 3.5 Tympanometry Screening

<b>Ages</b>	All
<b>Purpose</b>	To detect middle ear pathologies. Tympanometry must be performed together with pure tone air conduction screening
<b>Description</b>	Tympanometry is an objective measure used to test the integrity and function of the middle ear system.
<b>Equipment</b>	Screening tympanometer with appropriate sized probe tips. Tympanometers shall meet the performance and calibration requirements of ANSI S3.39 - 1987. Calibration of the equipment should be checked daily (Refer to Appendix B).
<b>Facilities</b>	Quiet room free from visual distractions
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. Explain the procedure to the child using age appropriate instructions (sit still, not to swallow)</li> <li>2. Select the correct size probe tip for an adequate seal.</li> <li>3. Place the probe tip snugly into the ear canal to obtain and maintain a seal</li> <li>4. Record the results on the screening form (Appendix C).</li> <li>5. For infection control, change the probe tip when testing the other ear.</li> </ol>
<b>Considerations</b>	<p>Tympanometry should not be performed if a child presents with the following signs and this should be an automatic referral for medical management:</p> <ul style="list-style-type: none"> <li>• Perforated eardrum</li> <li>• Drainage</li> <li>• Acute ear infections (e.g. otitis media or otitis externa)</li> <li>• Tenderness/soreness in the ear</li> <li>• Presence of a foreign body</li> </ul>
<b>Pass criteria</b>	<ul style="list-style-type: none"> <li>• Tympanometric shape: Sharp single peak</li> <li>• Middle ear pressure (MEP): -200 to +100 daPa</li> <li>• Static Compliance: 0.2 - 1.6 cm<sup>3</sup></li> <li>• Ear canal volume (ECV):</li> <li>• 0.4 – 1.0 cm<sup>3</sup> if no ventilation tubes</li> <li>• 1.0 - 5.5 cm<sup>3</sup> if child has ventilation tubes</li> </ul>
<b>Rescreen criteria</b>	A pass on pure tone screening but a refer on tympanometry should result in a rescreen within 30 days.
<b>Refer criteria</b>	<p>Referral to a PHC facility or medical practitioner is indicated if:</p> <ul style="list-style-type: none"> <li>• MEP: &gt; ± 200 daPa</li> <li>• Static compliance: &lt; 0.2</li> </ul>

	<ul style="list-style-type: none"> <li>• ECV: &lt; 1.0 cm<sup>3</sup> (in the presence of ventilation tubes)</li> </ul>
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### 3.6 Otoacoustic emissions (OAEs) screening

<b>Ages</b>	All
<b>Purpose</b>	In the screening context it could be used for standard screening or as an alternative measure for children who are unable to complete pure tone air conduction screening due to young age or physical, developmental and intellectual challenges.
<b>Description</b>	OAEs measure the outer hair cell function of the cochlea and do not assess hearing acuity. A pass result will be recorded for hearing levels of 30 dB or better (depending on whether TEOAEs or DPOAEs are used).
<b>Equipment</b>	Screening OAE machine Probe tips of varied sizes. Equipment shall meet the appropriate ANSI standards and be calibrated annually.
<b>Facilities</b>	Quiet room
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. Explain the procedure to the child using age appropriate language</li> <li>2. Select the correct size probe tip to ensure that an adequate seal is maintained.</li> <li>3. Place the probe tip snugly into the ear canal while the child sits still</li> <li>4. Record the results on the screening form (Appendix C)</li> <li>5. For infection control, change the probe tip when testing the other ear.</li> </ol>
<b>Considerations</b>	<p>OAEs should not be performed if a child presents with the following signs and this should be an automatic referral for medical management:</p> <ul style="list-style-type: none"> <li>• Perforated eardrum</li> <li>• Drainage</li> <li>• Acute ear infections (e.g. otitis media or otitis externa)</li> <li>• Tenderness/soreness in the ear</li> <li>• Presence of a foreign body</li> </ul>
<b>Pass criteria</b>	'Pass' result on both ears as per equipment protocol
<b>Rescreen criteria</b>	A child whose screening results indicate 'refer' should be rescreened immediately; including the use of screening tympanometry. If at the second screen, a 'refer' result is obtained, in the presence of normal tympanometry results, the child should be referred for diagnostic audiological assessment
<b>Refer criteria</b>	'Refer' result in one ear or 'refer' result in both ears refer the child to an audiologist for a diagnostic hearing assessment.

### 3.7 Parent/guardian notification of the results

Parent/guardian should receive written notification of their child's hearing screening results (Appendix C). A copy of the results with the referral letter (if required) must be forwarded to the parent/legal guardian for their records and/or follow-up.

### **3.8 Record keeping (data base)**

- An individual hearing screening form should be prepared for each learner screened (Appendix C). The form should include the date of the screening, the learner's name and date of birth, the name and title of the person performing the screening, the screening measures used, the screening results, and recommendations.
- A record of the informed consent and hearing screening results (with informed consent) should be kept in the learner's records.
- A copy of the informed consent and hearing screening results should be kept by the hearing screening programme manager and be safely stored for a period of five (5) years.
- A record of the hearing screening conducted (e.g. logbook) (See Appendix D).
- Information must be entered into an information database (district, provincial or national). At the least, information should be entered into a spreadsheet, with periodic checks by the hearing screening programme manager for completeness and accuracy of information entered.
- Accurate statistics should also be kept on the number of learners screened, number of referrals made, etc.

### **3.9 Referrals**

#### ***Rescreening***

- Children who obtained refer results after the initial screen should be rescreened on the day of the initial screen or be rescreened at next screening day that should be no later than 30 days of the first screening.

#### ***Referral forms and records***

- A referral letter and results of the screening should be provided via the child to the parent. The referral letter should include contact details of the screening team and/or of the school in order for the parent to address any queries (Appendix C).
- It is important to provide information about the appropriate services available in the area.

### **3.10 Monitoring and Follow-Up**

The screening team needs to make a decision about who will be responsible for the management of the referral and follow-up processes. School management is responsible for this.

### **3.11 Programme management**

It is the screening team's responsibility to ensure the needed forms are developed and available (Refer to Appendices for examples). Forms may include:

- Consent forms which must include pertinent history
- Screening forms
- Parent notification of results
- Referral notes on letterhead

Screening programmes must continually be reviewed for quality assurance purposes if they are to produce valid results and appropriate referrals. To assure quality, the screening team should:

- Have equipment calibrated annually and maintained properly
  - Ensure all personnel have been trained for hearing screening
  - Adhere to established screening protocol
  - Periodically evaluate the screening programme for specificity and sensitivity
- 
- Mechanisms should be integrated with existing health- and education management information systems
  - Data that should be recorded and maintained include:
    - Total number of schools in the district/province
    - Total number of schools where hearing screening was conducted
    - Total number of learners in grade targeted
    - Total number of learners screened
    - Number and percentage of learners who obtained a pass on the screening
    - Number and percentage of learners referred for medical management
    - Number and percentage of learners who accessed medical management
    - Number and percentage of learners referred for audiological assessment
    - Number and percentage of learners who accessed audiological assessmentNumber and percentage of learners diagnosed with hearing impairment following diagnostic audiological assessment  
Number and percentage of learners provided with assistive listening devices (e.g. hearing aids, cochlear implants, FM systems, etc.)

### **3.13 Equipment Standards and Calibration**

#### *Equipment standards*

- Equipment used for screening should meet the performance and calibration requirements of the following standards
  - Audiometers: ANSI 83.6 - 2010
  - Instruments to measure aural acoustic impedance and admittance: ANSI S3.39 - 1987

#### *Listening check of equipment*

A listening check of the audiometer should be performed prior to providing hearing screenings, by the screener or an individual with known normal hearing

## **H. TRAINING**

Standardized, accredited training will give screeners and stakeholders an understanding of the comprehensive nature of a quality school hearing screening programme.

### **1. Who may train**

The training may only be provided by an audiologist

## 2. Nature, content and standards of the training programme

### 2.1 Nature of the training

- The course should comply with HPCSA minimum standards and regulations
- The training course should include classroom instruction, work integrated learning (e.g. simulated learning and problem-based learning) as well as workplace-based learning (practical screening sessions at schools)
- The individual should be evaluated by means of a written and practical examination
- Clinical competency should be demonstrated for both the written and practical components of the course
- Time allocated to training should be sufficient for individuals to acquire competence in meeting the minimum standards

### 2.2 Content of the training

The training course for hearing screening personnel shall include TWO components, namely theoretical and clinical components.

#### **THEORETICAL COMPONENT**

Theoretical components for hearing screening technicians shall include, but shall not be limited to, the following topics:

##### ***Module 1: Introduction to hearing***

*Method of teaching:* Classroom instruction or e-learning (web-based learning)

*Hours:* Minimum 2 hours

*Proposed content:*

- Typical development of speech, language and hearing
- Anatomy and physiology of the ear
- Signs of hearing impairment in children
- Types of hearing loss in children
- Risk indicators for hearing impairment in children (See Appendix F)
- Prevention of hearing loss in children

##### ***Module 2: Introduction to hearing screening***

*Method of teaching:* Classroom instruction or e-learning (web-based learning)

*Hours:* Minimum 5 hours

*Proposed content:*

- Early identification of hearing impairment
- Principles of hearing screening
- Selection of hearing screening methods
- Components of setting-up a hearing screening program
- Infection control

- Ethics
- Challenges around hearing screening

**Module 3: Visual inspection of the outer and middle ear**

*Method of teaching:* Classroom instruction (or e-learning) and work integrated learning (e.g. simulated and problem-based learning).

*Hours:* Minimum 2 hours

*Proposed content:*

- Otoscope use
- Visual inspection of the outer ear and middle ear
- Referral

**Module 4: Pure tone audiometry**

*Method of teaching:* Classroom instruction (or e-learning) and work integrated learning (e.g. simulated and problem-based learning).

*Hours:* Minimum 4 hours

*Proposed content:*

- Selection and setting up a hearing screening site
- Environmental Noise Level Checks
- Audiometer use, care and calibration
- Performing pure tone audiometry
- Identifying children who need evaluation and/or referral
- Trouble shooting
- Adaptations and modifications for special populations

**Module 5: Tympanometry and OAEs**

*Method of teaching:* Classroom instruction (or e-learning) and work integrated learning (e.g. simulated and problem-based learning).

*Hours:* Minimum 4 hours

*Proposed content:*

- Environmental Noise Level Checks
- Use and care of equipment
- Performing tympanometry
- Performing OAEs
- Identifying children who need evaluation and/or referral
- Trouble shooting

**Module 6: Referral and reporting**

*Method of teaching:* Classroom instruction (or e-learning) and work integrated learning (e.g. simulated and problem-based learning).

*Hours:* Minimum 2 hours

*Proposed content:*

- Results of a hearing screening,
- Responses to a hearing screening outcome
- Procedures for recording and tracking
- Communication with all stakeholders
- Referral pathways and available community resources
- Reporting hearing screening results
- Record keeping/data base

### **2.3 Evaluation of the training**

#### **THEORETICAL COMPONENT**

- Evaluation should assess all expected competencies
- In order to pass, a student must demonstrate knowledge in all areas specified by the minimum standards
- Any component not passed must be repeated until knowledge is demonstrated

#### **PRACTICAL COMPONENT**

*Method of teaching:* Workplace-based learning (e.g. practical screening sessions at schools)

*Hours:* Minimum 10 hours

*Proposed activities:*

- Observation of hearing screening in schools (Minimum 2 hours)
- Perform peer screening (all hearing screening procedures covered) on at least 2 individuals (Minimum 2 hours)
- Perform at least 5 screenings (all hearing screening procedures covered) in pairs whilst observed by trainer (Minimum 2 hours)
- Perform all hearing screening procedures independently (under supervision) on at least 10 children (Minimum 4 hours)

#### **COMPETENCY EXAMINATION**

Competency should be formally assessed by the trainers via observation of at least FIVE complete screens, including the administration aspect of the screening programme

In order to pass, a student must demonstrate competence in all areas specified by the minimum standards

Any component not passed must be repeated until competence is achieved

#### **SUPERVISORY WORKPLACE VISIT**

The trainer should conduct a supervisory workplace visit for each of the hearing screening technicians trained within six months after completion of training. The objectives of the visit are:

- To confirm that hearing screening personnel are competent
- To address any challenges that the hearing screening personnel may experience

## **I. RECOMMENDATIONS**

In order to successfully and ethically implement hearing screening in South African schools:

- Audiologists should manage the screening programmes and ensure adherence with all HPCSA ethical guidelines
- All hearing screening personnel undergo appropriate training.
- Hearing screening programmes are jointly implemented with the responsible government agencies, academic institutions, etc.
- Mechanisms for programme monitoring and evaluation are established at all levels (district, provincial and national) that should also include the continued surveillance of learners identified with a hearing impairment.
- A standardised information infrastructure is developed (e.g. national data base) to enable the management of the school hearing screening programme.

## **J. CONCLUSION**

In South Africa, the goal of optimal ear and hearing health (and ultimately optimal academic success) for all children can only be achieved through well-coordinated and collaborative hearing screening programmes offered by well-trained screeners. In providing and managing screening services, there must be adherence with all HPCSA ethical rules and guidelines.

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**L. APPENDICES**

**Appendix A: Informed consent (Caregiver Notification and Permission)**

*Example of suggested content*

*Own letterhead (Name of department or practice, address and relevant contact details)*

[Date]

Dear Parent or Guardian,

Hearing screening will be conducted at your child's school on \_\_\_\_\_ [date].

**Why is it important to have your child's hearing screened?**

- Hearing is very important for speech and language development as well reading and learning.
- Hearing screening can identify if your child needs further hearing testing.

As part of the hearing screening we will look into your child’s ears and do some screening tests to check your child’s hearing. Depending on the results of the hearing screening, further testing may be required.

The results of the hearing screening will be available to you on the day of the screening.

Hearing screening is not compulsory and you may choose not to have your child’s hearing screened.

If you agree to having your child’s hearing screened, please complete the information below:

Name of child: \_\_\_\_\_

Date of birth: \_\_\_\_\_

Grade: \_\_\_\_\_

Please answer the following questions about your child’s hearing:

	Yes	No
Are you concerned about your child’s hearing? If yes, please explain:		
Is there anyone in your family with a hearing problem? If yes, please explain:		
Does your child complain about sore ears? If yes, please explain:		
Does your child have a history of ear infections? If yes, please explain:		

I hereby give permission:

	YES	NO
To have me child’s hearing screened		
To have the results kept on record at school		

Signature of parent/caregiver: \_\_\_\_\_ Date: \_\_\_\_\_

Should you require any further information, please feel free to contact \_\_\_\_\_ [*add name*]  
at \_\_\_\_\_ [*add contact details*].

**Appendix B: Biologic calibration and mechanical function check form**

*Adapted from the Minnesota Department of Health Hearing Screening Training Manual (2014)*

**Mechanical function checks of the audiometer**

A listening check should be performed prior to providing hearing screenings, by the screener or an individual with known normal hearing.

Audiometer ID: \_\_\_\_\_ Date: \_\_\_\_\_ Screener: \_\_\_\_\_

Parts and functions	Description	Completed [v]
Power on	There is power to the audiometer	
Jacks	Jacks are in proper receptacle [R in red; L in blue] and pushed in all the way	
Headphone cushions	Cushions are clean, pliable and free from damage	
Dials	Frequency and decibel dials work (no slippage)	
Headband	Headband has enough tension Put on headphones and check that the rest snugly on both ears	
Tone ON of OFF	Sound is on when you present a tone and off when not presenting a tone	
Cords	Cords are in good condition Turn the selector switch on, twist the cord at right headphone and jack, repeat for the left headphone and jack Sound should not cut out or be scratchy	
Volume	Volume increases and decreases by turning the hearing level (HL) dial and listening for changes in loudness	
Pitch	Pitch changes by turning the frequency dial and listening for changes in pitch	
Tone presenter switches	Switch works by pressing it Tone goes off when not pressing	
Static	No static is heard	
Cross talk	No sound is heard in the right earphone when listening to the left earphone, and vice versa.	
Comments:		

**Biologic calibration**

Audiometer ID: \_\_\_\_\_ Date: \_\_\_\_\_ Screener: \_\_\_\_\_

Date	Phone	500 Hz	1000 Hz	2000 Hz	4000 Hz
	Red (R)				
	Blue (L)				

**Daily calibration of tympanometer**

Tympanometer ID: \_\_\_\_\_ Date: \_\_\_\_\_ Screener: \_\_\_\_\_

Description	Completed [v]
Ensure pump is operational and tube not blocked by conducting a tympanogram on an ear that is known to produce a normal, peaked tympanogram	
Probe fitted to appropriate cavity (as supplied by the manufacturer) Acceptable values: 0.5 cm <sup>3</sup> cavity: 0.5 cm <sup>3</sup> 2.0 cm <sup>3</sup> cavity: 1.9 - 2.1 cm <sup>3</sup> 5.0 cm <sup>3</sup> cavity: 4.8 - 5.2 cm <sup>3</sup>	
Comments:	

**Appendix C: Hearing screening record form and referral letter**

*Example of suggested content - on letterhead*

School: \_\_\_\_\_ Date of testing: \_\_\_\_\_ Screener: \_\_\_\_\_

Name of learner: \_\_\_\_\_ Grade: \_\_\_\_ Date of birth: \_\_\_\_\_ Gender: M/F

**1. Pertinent case History:**


**2. Visual inspection of ear**

	Normal	Cerumen occlusion		Perforation	Foreign object	Discharge	Other	Pass	Refer
		Partial	Complete						
Right ear									
Left ear									

**3. Screening OAE:**

**Tympanometry:**

	CNT*	Pass	Refer
Right ear			
Left ear			

	ECV 0.4 – 1.0 cm <sup>3</sup>	Pressure -200 to +100 daPa	Compliance 0.2 - 1.6 cm <sup>3</sup>
Right ear			
Left ear			

Pass	Refer

**4. Pure tone Audiometry:**

	CNT*	500Hz	1000Hz	2000Hz	4000Hz
Right ear					
Left ear					

Pass	Refer

\*CNT = Could not test

**5. Ambient noise levels during testing:**

**6. Recommendations:**

Normal hearing: No referral required		
Refer to audiologist for diagnostic assessment		
Refer for medical management		
Within 30 day retest for those with refer findings		
Other		
Comments		

Should you require any further information, please feel free to contact \_\_\_\_\_  
[name]at \_\_\_\_\_ [contact number].

Name of screener: \_\_\_\_\_ Signature: \_\_\_\_\_







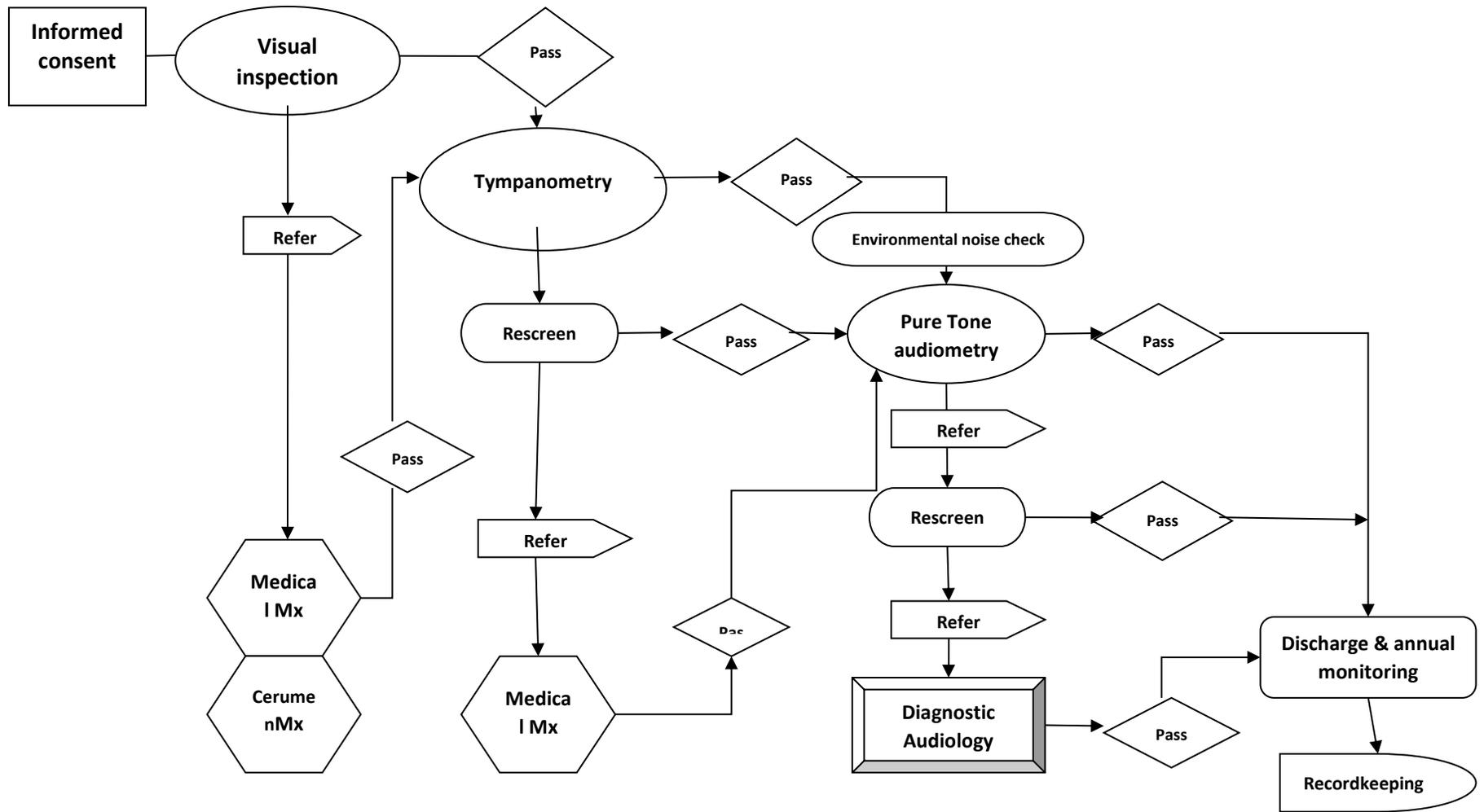
## **Appendix F: Risk Indicators for hearing impairment**

*Compiled from the HPCSA EHDI Position Statement (2018)*

There are a number of high risk indicators for delayed onset, progressive and acquired hearing impairment in children. The screening team to be aware of these indicators to be able to identify these factors when presented in different children.

- Caregiver concern regarding hearing, speech, language, or developmental delay.
- Family history of permanent childhood hearing loss.
- Recurrent or persistent otitis media with effusion for at least 3 months.
- Neonatal indicators:
  - Neonatal intensive care (NICU) admission for more than 5 days.
  - Hyperbilirubinemia at a serum level that required exchange transfusion.
  - Persistent pulmonary hypertension of the newborn associated with mechanical ventilation, and conditions requiring the use of extracorporeal membrane oxygenation (ECMO).
- In utero infections such as cytomegalovirus (CMV), herpes, rubella, syphilis, toxoplasmosis, human immunodeficiency virus (HIV) and malaria.
- Chemotherapy and exposure to ototoxic medications (gentamycin and tobramycin) or loop diuretics (furosemide also known as Lasix).
- Craniofacial anomalies, including those that involve the pinna, ear canal, ear tags, ear pits, and temporal bone anomalies.
- Physical findings, such as a white forelock that are associated with syndrome, known to include sensorineural or permanent conductive hearing impairment.
- Syndromes associated with congenital hearing impairment or progressive or late onset hearing impairment such as neurofibromatosis, osteoporosis, and Usher syndrome; other frequently identified syndromes include Alport, Pendred, and Jervell and Lange-Nielson.
- Neurodegenerative disorders such as Hunter syndrome, or sensory motor neuropathies such as Friedreich's ataxia and Charcot-Marie-Tooth Syndrome.
- Culture positive postnatal infections associated with sensorineural hearing loss including confirmed bacterial and viral meningitis.
- Head trauma, especially basal skull or temporal bone fractures that required hospitalization.
- HIV infection, Tuberculosis and Malaria.

**Appendix G: Algorithm Protocol A**  
 (Visual inspection, Tympanometry and Pure Tone Audiometry)





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