



## PROCEDURE

### Audiometry

<b>Scope (Staff):</b>	Community health
<b>Scope (Area):</b>	CAHS-CH, WACHS

#### Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

### Aim

To conduct hearing screening assessments for children from the age of 3 years.

### Risk

Unrecognised or unmanaged hearing impairment can have a significant effect on a child's social, psychological, and educational progress, including speech and language development, and long term social and vocational outcomes.<sup>1</sup>

### Background

Audiometry is part of comprehensive ear health and hearing screening for children. Screening includes otoscopy and may also include video otoscopy and/or tympanometry. The ear health and hearing screening schedule for Western Australian children can be viewed in the Hearing and Ear Health guideline.

Audiometry measures how well a person hears the range of sound frequencies that correspond to frequencies used in normal speech. Frequencies are measured in hertz (Hz). Intensity (loudness) is measured in decibels (decibels Hearing Level or dB HL).

Results are recorded to indicate hearing within normal limits, or reduced response or no response which indicate a need to repeat the test at a later date, and/or refer for further assessment and treatment.

Audiometry may be used for children from the age of 3 years depending on the child's development, the setting, and circumstances.

## Key points

- See [Hearing and ear health](#) guideline for screening schedules for WA children.
- Audiometry is only to be performed by staff who have completed training approved by CAHS-CH or WACHS.
- Both ears are to be tested at 50/35/25 dB, at both 1000 and 4000 Hz at initial test.
- Clinical judgement is important to determine actions required for each child, including the following considerations;
  - parent/caregiver hearing screening question responses
  - otoscopy, audiometry and/or tympanometry results
  - nursing observations
  - teacher observations, as relevant
  - child's risk factors and social circumstances.
- Key health education messages for families, children and school staff are to be provided as appropriate for the audience. See the [Hearing and ear health](#) guideline for key messages.
- When a child is not willing to have the procedure and/or staff or parent have concerns, discuss referral options with parent/caregiver.
- If there is evidence that the child is under the care of a relevant health professional, clinical judgement about the need for audiometry is required.
- Children with programmable ventriculoperitoneal (VP) shunts are not to have an audiometry assessment. The presence of magnets in the headphones may alter the valve settings and result in the need to recalibrate the shunt. Refer the child to an audiologist for assessment if required.
- All nurses will refer to the [Nursing and Midwifery Board AHPRA Decision-making framework](#) in relation to scope of practice and delegation of care to ensure that decision-making is consistent, safe, person-centred and evidence-based.
- Nurses are to deliver culturally safe services by providing a welcoming environment that recognises the cultural beliefs and practices of all clients.
- Community health nurses must follow the organisation's overarching Infection Control Policies and perform hand hygiene in accordance with WA Health guidelines at all appropriate stages of the procedure.

## Equipment

- Audiometer (calibrated annually). Calibration date to be indicated on the machine. (CAHS refer to the [Medical equipment repair, maintenance and calibration workflow for CAHS Community Health](#) for advice on calibration of audiometers).
- Blocks in a container.

- Headphones are to be cleaned between each child. Each audiometer model has specific cleaning requirements. In general, detergent wipes are appropriate, but staff should refer to manufacturer's instructions for specific cleaning requirements.

## Process

Steps	Additional Information
<p><b>1. Preparation for screening session</b></p> <ul style="list-style-type: none"> <li>• Check the operation of the audiometer before use.</li> <li>• Check calibration currency.</li> <li>• Secure a quiet room with minimal external noise.</li> <li>• Check health records to obtain relevant health history.</li> </ul>	<ul style="list-style-type: none"> <li>• Audiometer models differ in controls layout, but each machine offers the same functions.</li> <li>• Ensure the audiometer has its specific headphones attached. Headphones cannot be interchanged as they are calibrated together with the audiometer.</li> <li>• If a quiet room is not available, do not continue with audiometry testing.</li> <li>• Ask the teacher about any concerns for individual children.</li> </ul>
<p><b>2. Engagement and consent</b></p> <ul style="list-style-type: none"> <li>• Ask parent/caregiver about health history,</li> <li>• <b>and/or</b></li> <li>• Check parent/caregiver responses in CHS409-1, CHS409-5 or CHS719.</li> <li>• Explain the procedure to the child and parent/caregiver, if present. Allow time for discussion of concerns.</li> <li>• Ensure written or verbal parental consent has been obtained prior to audiometry.</li> </ul>	<ul style="list-style-type: none"> <li>• See <i>Hearing and ear health</i> guideline for ear health history guide.</li> <li>• If child is not willing to have the test and staff or parents have concerns, arrange for a screen at a later date, or discuss referral options with parent/caregiver.</li> </ul>
<p><b>3. Prior to audiometry</b></p> <ul style="list-style-type: none"> <li>• Position child to be seated facing and within one arm length of the examiner, where the child cannot see the examiner's use of the controls.</li> <li>• Conduct otoscopy first. If evidence of pain or discharge, do not proceed to audiometry.</li> </ul>	<ul style="list-style-type: none"> <li>• The examiner to be seated at the same level as the child, enabling observation of the child's facial expressions.</li> <li>• If parent/caregivers are present, ask to sit nearby, but to avoid giving cues.</li> <li>• Choose a suitable task that suits the child, for example:</li> </ul>

Steps	Additional Information
<ul style="list-style-type: none"> <li>• Determine the child’s understanding and ability to complete the task when a sound is presented to them.</li> <li>• Select age-appropriate task to accurately identify the child’s ability to indicate when they hear test sounds.</li> <li>• Demonstrate the sound and the task. Take time to help the child to learn and practice the task.</li> <li>• Ensure headphones fit comfortably, remove glasses, and place hair (and any head covering) behind ears.</li> <li>• Place the rubber cushions so the diaphragms are aimed directly at the opening into the ear canal. Pull down the yokes of the phones and adjust for firm fit.</li> </ul>	<ul style="list-style-type: none"> <li>○ Young children: “When you hear the sound (whistle or noise), give me the block.” Blocks need to be passed easily between the child and tester.</li> <li>○ Kindergarten and Pre-primary children: “When you hear the sound, put the block in the bucket/on the table.”</li> <li>○ Older children: “When you hear the sound, wave or raise your hand.”</li> </ul>
<p><b>4. Audiometry procedure: <i>Right ear</i></b></p> <ul style="list-style-type: none"> <li>• Ensure red earphone is on the right ear.</li> <li>• Give simple, clear instructions.</li> <li>• Set intensity at 50 dB HL at 1000 Hz for the right ear.</li> <li>• Present the tone for 2-3 seconds.</li> <li>• If the child responds, lower to 35 dB HL and then to 25 dB HL.</li> <li>• Repeat last sound heard to ensure accuracy of results.</li> <li>• Repeat procedure at 4000 Hz.</li> <li>• Record result.</li> </ul>	<ul style="list-style-type: none"> <li>• Endeavour to keep child engaged and on task throughout the procedure.</li> <li>• Occasionally praise the child’s responses throughout the procedure.</li> <li>• Always start at the loudest noise level 50 dB HL in order to obtain a positive response from the child.</li> <li>• If there is no response at 50 dB HL the result should be documented as ‘no response’.</li> <li>• Vary the time intervals between the delivery of audiometry tones to prevent rhythmical responses from the client.</li> </ul>
<p><b>5. Audiometry procedure: <i>Left ear</i></b></p> <ul style="list-style-type: none"> <li>• Reset intensity at 50dB HL at 1000Hz.</li> <li>• Repeat as above and record result.</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> </ul>

Steps	Additional Information
<ul style="list-style-type: none"> <li>Repeat procedure at 4000 Hz in the left ear and record result.</li> </ul>	
<p><b>The child is required to respond twice at 25 dB HL at both 1000 and 4000 Hz in each ear for 'no concerns' to be recorded in the audiometry screening.</b></p>	
<p><b>6. Reduced response</b></p> <ul style="list-style-type: none"> <li>If a correct response is not obtained (twice) at 25 dB HL, record the last level at which the child did respond.</li> <li>If the child does not respond at 50 dB HL, recheck equipment, re-instruct and try again.</li> <li>If there is still no response record <b>No Response</b> on the results sheet.</li> <li>'No concern' is recorded when a client achieves 25 dB HL twice in each ear.</li> </ul>	<ul style="list-style-type: none"> <li>Recheck audiometer, including the battery.</li> <li>Check that the headphones are connected and working.</li> <li>Consider recheck after 4-6 weeks to allow time for temporary issues to resolve.</li> </ul>
<p><b>7. Communicate results with parents</b></p> <ul style="list-style-type: none"> <li>If parent/caregiver present, discuss audiometry findings including any concerns.</li> <li>If parent/caregiver not present: <ul style="list-style-type: none"> <li>Contact them to discuss concerns, and any need for recheck.</li> <li>Provide results in writing using CHS409-6A <i>Results for parents</i> sheet or other relevant form.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>If unable to contact parent/caregiver by phone to discuss a concern, follow CAHS-CH or WACHS processes to provide effective communication with family.</li> <li>If hearing concerns are identified, gain permission from parent to discuss results and support strategies with teacher.<sup>6</sup></li> </ul>
<p><b>8. Recheck procedure (after 4-6 weeks)</b></p> <ul style="list-style-type: none"> <li>Repeat steps 1 to 5.</li> <li>If a child does not achieve 25 dB HL (twice) in either ear, undertake expanded screening and refer for further audiological assessment.</li> </ul>	<ul style="list-style-type: none"> <li>No action required if results are 25 dB HL (x2) in both ears at 1000//4000Hz.</li> </ul>
<p><b>9. Expanded screening</b></p>	

Steps	Additional Information
<ul style="list-style-type: none"> <li>• Test at two additional frequencies - 500 Hz and 2000 Hz.</li> <li>• Start at 50 dB, then 35dB, then 25 dB. Repeat the last sound heard by the child twice.</li> </ul>	<ul style="list-style-type: none"> <li>• Results provide more information about the child's hearing and may indicate a pattern of hearing loss.</li> </ul>
<p><b>10. Referral and review</b></p> <ul style="list-style-type: none"> <li>• Make a clinical judgement about the need for referral based on screening assessments, observations and other relevant information.</li> <li>• Consider a review in 4-6 weeks in cases of recent upper respiratory tract infection, or for children who are otherwise unwell or uncooperative.</li> <li>• Provide referral as indicated to audiologist, medical practitioner, Ear, Nose and Throat (ENT) clinic, speech pathologist or other health practitioner.</li> <li>• Include otoscopy results, as well as tympanometry and/or audiometry results if conducted.</li> <li>• Discuss and seek consent for referral from parent/caregiver.</li> <li>• For children at risk, follow up with patient/caregiver to determine if support is needed to action the referral.</li> </ul>	<ul style="list-style-type: none"> <li>• For results suggesting otitis media and related issues, refer to a medical practitioner.</li> <li>• For results suggesting sensory neural hearing loss or ongoing chronic middle ear pathology concerns, refer to Audiology.</li> <li>• If hearing concerns are identified, gain permission from parent to discuss results and support strategies with teacher.<sup>6</sup></li> <li>• Adherence to CAHS-CH and WACHS clinical handover processes is required when handing over, or referring a client within, or outside of, the health service.</li> <li>• CAHS CH: The <a href="#">Aboriginal ENT Clinic</a> provides a free specialist ENT service. Include clinic's email in referral: <a href="mailto:cach.earhealthreferral@health.wa.gov.au">cach.earhealthreferral@health.wa.gov.au</a> See clinic information for referral requirements.</li> </ul>

## Documentation

Nurses maintain accurate, comprehensive, and contemporaneous documentation of assessments, planning, decision making and evaluations according to CAHS-CH and WACHS processes.

## Compliance monitoring

Failure to comply with this policy document may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Integrity Policy Framework](#) issued pursuant to section 26 the [Health Services Act 2016](#) (WA) and is binding on all CAHS and WACHS staff as per section 27 of the same Act.

Compliance monitoring methods will include:

- Health Service reporting of Universal Child Health Contacts.
- Health Service reporting of Aboriginal Ear Health Assessment.

References
1. Coates H, Kong K, Mackendrick A, Bumbak P, Perry C, Friedland P, Morris P & Chunghyeon O. <i>Aboriginal, Torres Strait Islander and Pacific Islander Ear Health Manual</i> . Perth: Garnett Passe and Rodney Williams Foundation, 2020. Fourth Edition - <a href="#">Aboriginal, Torres Strait Islander and Pacific Islander Ear Health Manual</a>
2. Leach AJ, Morris P, Coates HLC, et al. <i>Otitis media guidelines for Australian Aboriginal and Torres Strait Islander children: summary of recommendations</i> . 2020 Otitis Media Guidelines for Aboriginal and Torres Strait Islander Children
3. Government of Western Australia. <i>WA Child Ear Health Strategy</i> . Perth; 2017.
4. Centre for Remote Health, 2022. <i>CARPA Standard Treatment Manual (8th edition)</i> . Alice Springs, NT: Flinders University.
5. Yong M, Panth N, McMahon CM, Thorne PR & Emmett SD. How the World's Children Hear: A narrative review of school hearing screening programs globally. <i>American Academy of Otolaryngology – Head and Neck Surgery, OTO Open</i> 2020, 4(2): 1-8.
6. National Institute for Health and Care Excellence. Otitis media with effusion in under 12s, NICE guideline: NICE; 2023.

Related internal policies, procedures and guidelines
The following documents can be accessed in the CH Clinical Nursing Manual: <a href="#">HealthPoint link</a> or <a href="#">Internet link</a> or for WACHS staff in the <a href="#">WACHS Policy Manual</a>
Hearing and Ear Health guideline
Otoscopy procedure
Tympanometry procedure
Physical assessment 0-4 years guideline
Universal Contact - School Entry Health Assessment guideline
Factors impacting child health and development
The following documents can be accessed in the <a href="#">CACH Operational Policy Manual</a>
Client identification

Consent for services
<b>The following documents can be accessed in the CAHS Policy Manual</b>
Hand Hygiene (Infection Control Manual)
<b>The following documents can be accessed in the <u>WACHS Policy Manual</u></b>
Ear tissue spearing, irrigation and ear drop installation procedure
Engagement procedure
Enhanced Child Health Schedule
<b>Related internal resources – <u>CACH forms</u></b>
Ear health school screening – Consent CHS 719
Ear health assessment CHS 423
Ear health assessment results for parents CHS 423A
School Entry Health Assessment Parent Questionnaire CHS 409-1
School Entry Health Consultation for Education Support Students CHS 409-5
School Entry Health Assessment Results for parents CHS 409-6A
Clinical Handover/Referral CHS 663
Referral to Community Health Nurse CHS142
<b>Related internal resources – <u>CAHS School Health Forms</u></b>
Consent for ear health school screening form CHS 719
Ear health assessment results CHS 423
Ear health school screening results for parents CHS 423A
School Entry Health Assessment Parent Questionnaire CHS 409-1
School Entry Health Consultation for Education Support Students CHS 409-5
School Entry Health Assessment Results for parents CHS 409-6A
Clinical Handover/Referral CHS 663
<b>Related WACHS resources</b>

<a href="#">Child Ear Health Services: Codesign Framework</a>
Ear Health Module 1 – Overview (EHOV EL1) WACHS My Learning
Ear Health Module 2 – Otoscopy (EHOT EL1) WACHS My Learning
Ear Health Module 3 – Tympanometry (EHTT EL1) WACHS My Learning
Ear Health Module 4 – Play Audiometry (EHPA EL1) WACHS My Learning
Ear Health Module 5 – Referrals (EHRE EL1) WACHS My Learning
The following resources can be accessed from WACHS My Learning
<b>Related CACH e-Learning</b>
<a href="#">Aboriginal Cultural eLearning (ACeL) - Aboriginal Health and Wellbeing</a>
CACH Ear Health Module 1: Ear Health Assessment and Hearing Screening
CACH Ear Health Module 2: Otoscopy
CACH Ear Health Module 3: Child Health Tympanometry
CACH Ear Health Module 4: School Health Tympanometry
<b>Related external resources</b>
Coates H, Kong K, Mackendrick A, Bumbak P, Perry C, Friedland P, Morris P & Chunghyeon O. Aboriginal, Torres Strait Islander and Pacific Islander <a href="#">Ear Health Manual</a> . Perth: Garnett Passe and Rodney Williams Foundation, 2020.
<a href="#">PLUM and HATS speech resource</a> – Pictures and questions to assist with talking to parents about hearing, speech and language, National Acoustic Laboratories.
<a href="#">Blow-Breathe-Cough Program</a> . Hearing Australia resources for teachers and early childhood educators to promote ear health.
<a href="#">Care for Kid's Ears</a> . A wealth of information and resources for parents, early childhood educators, teachers and health professionals. Includes material in several different language groups.
<a href="#">Otitis Media Guidelines Smartphone App</a> . Created by the Centre for Research Excellence in Ear and Hearing Health of Aboriginal and Torres Strait Islander Children. The App is for use by clinicians and health workers who have responsibility for management of OM in Aboriginal and Torres Strait Islander children – in urban, rural and remote populations.
<a href="#">Hearing tests and how to help</a> (in <b>Related CDS resources</b> ).

This document can be made available in alternative formats on request.

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## Healthy kids, healthy communities

Compassion
Excellence
Collaboration
Accountability
Equity
Respect

Neonatology | Community Health | Mental Health | Perth Children's Hospital