



## PROCEDURE

# Tympanometry

<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 measure the functioning of the middle ear by assessing the ear canal volume, middle ear pressure and compliance/admittance function of the middle ear.

## Risk

Non-compliance with the procedure may result in:

- delay to identification and effective treatment of conditions of the middle ear, with the possibility of resultant long-term hearing loss.
- client safety being compromised if contraindications to tympanometry are not identified.

## Background

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

Tympanometry can be used to describe normal or abnormal middle ear function in response to sound and air pressure<sup>1,2</sup>. Tympanometry is used in conjunction with otoscopy to identify deviations from normal such as the presence of middle ear fluid, tympanic membrane (TM) perforation and Eustachian tube dysfunction, which all may impact on hearing<sup>1-3</sup>. Otoscopy might not always be possible, particularly with a young

infant, and it may sometimes be difficult to attain a clear view of the anatomy of the tympanic membrane<sup>4</sup>.

Tympanometry provides information about:<sup>1</sup>

- Middle ear pressure – the pressure of the air contained within the middle ear. It is determined by the position of the ‘peak’ of the tympanometric trace along the pressure axis.  
Normal middle ear pressure values for children aged 6 months and above are *+50 daPa to -200 daPa*.
- Compliance/admittance – refers to the mobility of the middle ear system. It is determined by the height of the ‘peak’.  
Normal compliance/admittance values for children 6 months and above range from *0.3 to 1.5 ml*.
- (ECV) Ear canal volume - this value is reported by the tympanometer. Normal ECV ranges are: *0.3 to 0.9 ml* for children over 6 months and under 12 years,<sup>3, 5</sup> and *0.5 to 1.5ml* for children aged 12 years and over <sup>6</sup>.

The infant ear anatomy differs in many ways when compared with the adult ear. For example, the infant ear has a bony region that is not yet completely formed, resulting in a highly compliant ear canal. Because of these differences, a higher frequency 1000 Hz probe tone has greater sensitivity for correct identification of middle ear effusion in infants below 6 months of age<sup>4, 6-8</sup>.

- There is no normal range for compliance or middle ear pressure peak types for 1000Hz tympanometry<sup>4</sup>.
- Ear canal volume (ECV) – the normal volume range for infants under 6 months of age (corrected) is *0.2 to 0.8 ml*. However, this range is not considered reliable for the interpretation of tympanographs<sup>4</sup>. The exception is for use as an indicator of a possible blockage (i.e. very small volume recorded <0.2ml), although this should be verified by otoscopy or checking the probe <sup>6</sup>.

## Key points

- Otoscopy should be performed prior to tympanometry<sup>3</sup>. If any of the following are identified, tympanometry will not be undertaken:
  - ear pain
  - tympanic membrane is inflamed or bulging
  - evidence of discharge or foreign objects in the auditory canal
  - within two months of ear surgery, unless approved by an ENT Specialist<sup>6</sup>.
  - client has a programmable Ventriculo-Peritoneal shunt (PVP) shunt<sup>9, 10</sup>.
- Tympanometry can confirm the presence of a TM perforation.
  - If otoscopy shows an evident TM perforation, do not perform tympanometry as it will not add any extra information.

- When the drum is not able to be clearly visualised, tympanometry can be useful in identifying perforations. It can also identify blocked grommets.
- Tympanometry should not be performed on a moist or discharging perforation.<sup>6</sup>
- Tympanometry is to be discontinued immediately if there is any evidence of pain.
- When a child is not willing to have the procedure and staff or parent have concerns, discuss referral options with parent/caregiver.
- Regular and opportunistic ear health screening for Aboriginal\* children aged 0 – 5 years is critical to preventing ear disease and optimising health and development<sup>11</sup>.
- If there is evidence that the child is under the care of a relevant health professional, clinical judgement about the need for assessment is required.
- Ear health screening for WA children is outlined in the *Hearing and ear health* guideline.
- Key health education messages for families, children and school staff are to be provided as appropriate for the audience.
- Nurses need to provide a culturally safe service delivery which demonstrates a welcoming environment that recognises the importance of cultural beliefs and practices of all clients.
- Tympanometry is only to be performed by staff who have completed CAHS-CH or WACHS training.
- 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.
- Community health staff 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

- Tympanometer with spare batteries:
  - 1000 Hz probe tone for **infants under 6 months**
  - 226 Hz probe tone for **children 6 months and over**

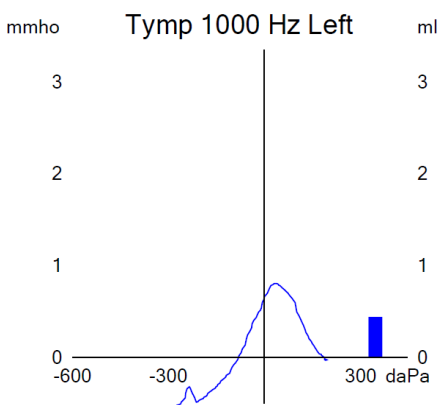
**NB.** Consider assessment with both probes for infants aged from 6 – 9 months. If results are discrepant, disregard 226Hz result and only use the 1000Hz results.
- Disposable ear tips of various sizes
- Tympanometry printer (fully charged) and spare paper rolls (as applicable)

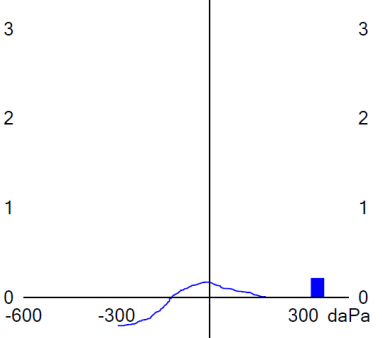
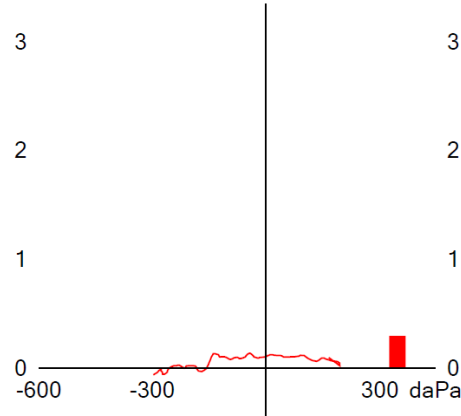
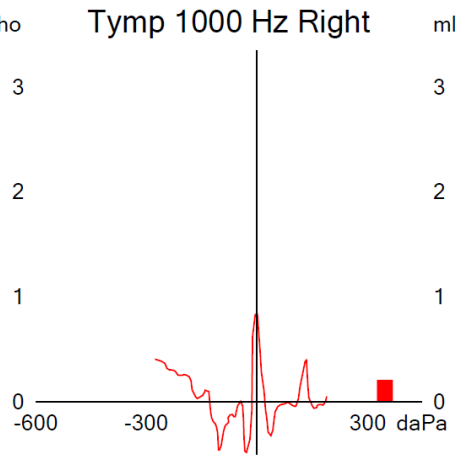
\* MP 0097/18 - Within Western Australia, the term Aboriginal is used in preference to Aboriginal and Torres Strait Islander, in recognition that Aboriginal people are the original inhabitants of Western Australia. No disrespect is intended to our Torres Strait Islander colleagues and community.

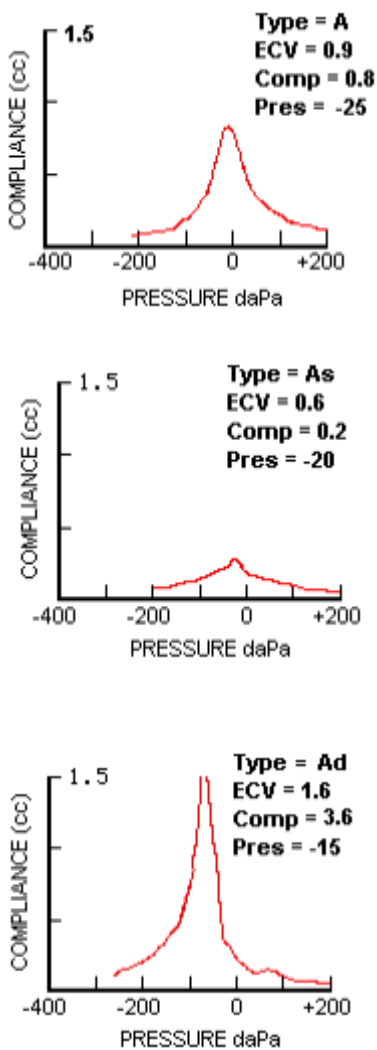
## Process

Steps	Additional Information
<p><b>1. Preparation for screening session</b></p> <ul style="list-style-type: none"> <li>• Check the operation of the tympanometer and printer before use.</li> <li>• Secure a suitable room with privacy and minimal distractions.</li> <li>• Check health records to obtain relevant health history, if available.</li> <li>• In school settings, ask teacher about any concerns for individual children.</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to the manufacturer instructions for operation and annual calibration details.</li> <li>• Daily checks of the tympanometer as per manufacturer's instructions<sup>6</sup> should be performed at the start of each day, prior to commencing the procedure.</li> <li>• Children with PVP shunts are not to have a tympanometry assessment completed. The presence of magnets in the equipment can potentially alter the valve settings, resulting in the need to recalibrate the shunt<sup>9, 10</sup>. Refer child to CDS Audiology for specialist assessment.</li> </ul>
<p><b>2. Engagement and consent</b></p> <ul style="list-style-type: none"> <li>• Review past and current ear health: <ul style="list-style-type: none"> <li>○ In child health settings ask parent/caregiver about health history</li> <li>○ In School Entry Health Assessments (SEHA) review parent/caregiver responses in CHS409-1 or CHS409-5</li> <li>○ In other school-aged contacts review parent/caregiver responses in CHS719.</li> </ul> </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 parent/caregiver consent is obtained prior to tympanometry.</li> </ul>	<ul style="list-style-type: none"> <li>• See <i>Hearing and ear health</i> guideline for ear health history guide.</li> <li>• When parent/caregivers are present, encourage involvement with the procedure, where possible.</li> </ul>
<p><b>3. Prior to tympanometry</b></p> <ul style="list-style-type: none"> <li>• Otoscopy should be conducted before tympanometry<sup>3</sup>. If any</li> </ul>	<ul style="list-style-type: none"> <li>• In some circumstances, especially with younger infants, it may not be possible to visualise the ear drum with otoscopy.</li> </ul>

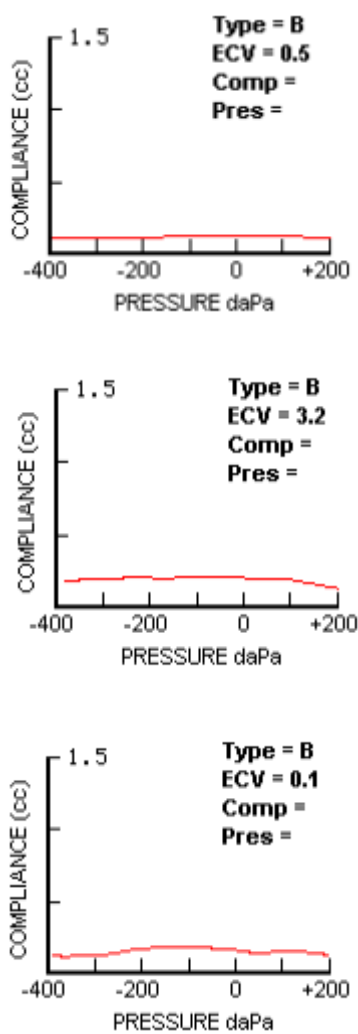
Steps	Additional Information
<p>contraindications to tympanometry are present (as listed in key points), do not proceed<sup>12</sup>.</p> <ul style="list-style-type: none"> <li>• Ask the parent/caregiver to hold the child's head securely against their chest and use their other arm to secure the child's arms and body to stop any sudden movement.</li> <li>• Older children may prefer to stand or sit.</li> <li>• To prepare the child for the examination, show the child the tympanometer.</li> <li>• Explain to the child and the parent/caregiver that when the tympanometer probe is inserted into the ear, they will hear a humming sound.</li> </ul>	<p>However, it is important to rule out the presence of foreign bodies or discharge from ear before doing tympanometry. Tympanometry can proceed when wax, grommets or a narrow or bending canal are present.</p> <ul style="list-style-type: none"> <li>• Ask the child to stay quiet and still during this test. They should not be speaking, sucking or swallowing, as this interferes with the tympanogram recording.</li> </ul>
<p><b>4. Tympanometry procedure</b></p> <ul style="list-style-type: none"> <li>• Select an ear tip slightly larger than the external auditory canal.</li> <li>• For infants, gently pull the pinna down and back with one hand. Use the other hand to insert the probe into the external auditory canal.</li> <li>• For children, gently pull the pinna up and back with one hand. Use the other hand to insert the probe into the external auditory canal.</li> <li>• Create an air-tight seal by gently rotating wrist towards the child's eye, (so screen is on top and visible).</li> <li>• Watch the screen to confirm that a seal has been achieved, and then hold the tympanometer still.</li> <li>• When the test has been completed, remove ear probe by gently rotating the wrist to break the seal.</li> <li>• Record the measurements (as displayed on the screen) for pressure,</li> </ul>	<ul style="list-style-type: none"> <li>• The examiner should be positioned at the same level as the child's ear, with a clear view of the tympanometer screen.</li> <li>• Stabilise hands by keeping one hand on the child's pinna and the other holding the tympanometer.</li> <li>• Discontinue the procedure immediately if there is any evidence of pain.</li> <li>• If a result is unclear or unexpected, repeat test up to three times.</li> <li>• Use CHS409-2 to record results for SEHA contacts and CHS423 for other contacts prior to entering in electronic records.</li> <li>• Attach paper tympanogram trace to client's paper record and attach a scanned copy to the electronic health record.</li> </ul>

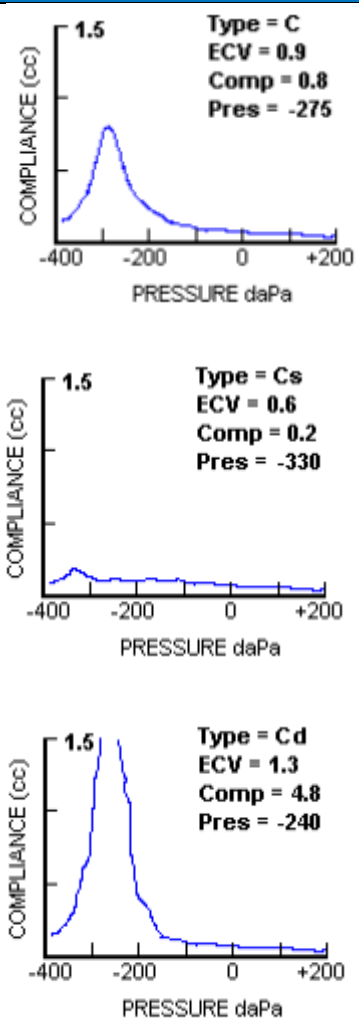
Steps	Additional Information
<p>compliance/admittance and ear canal volume in case of printer issues.</p> <ul style="list-style-type: none"> <li>Repeat procedure with other ear.</li> <li>Print the tympanogram traces.</li> </ul>	<ul style="list-style-type: none"> <li>Use of printers is determined according to CAHS-CH or local WACHS processes.</li> </ul>
<p><b>5a. Interpreting results:</b></p> <ul style="list-style-type: none"> <li><b>Infants under 6 months</b> (corrected age)<sup>4, 13</sup></li> </ul> <p>There is no normal range for ECV, admittance, or middle ear pressure peak types for 1000 Hz tympanograms in this age group. Instead, 1000Hz tympanograms are classified as normal or abnormal based on the presence of a positive peak. A positive peak (at a positive or negative middle-ear pressure) is regarded as normal, whereas a flat or “trough-shaped” (negative) peak is abnormal and suggests middle ear effusion<sup>14</sup>.</p> <p>Results are classified as follows:</p> <p><b>Positive peak</b> - normal  <b>No peak or negative peak</b> – abnormal</p> <p>See examples:</p> <p><b>Positive peak - normal</b></p>  <p><b>Positive peak - normal</b></p>	<ul style="list-style-type: none"> <li>A very small ECV of less than 0.2ml may indicate a possible blockage, although this should be verified by otoscopy or checking the probe.</li> <li>Clinical judgement about the need for referral and review includes consideration of tympanometry and otoscopy results, hearing screening question responses and the individual health and social circumstances.</li> <li><b>NB.</b> Tympanometry is not a test of hearing. Parental concern regarding hearing is one of the most important risk factors, even if tympanometry is normal. If a caregiver’s primary concern is hearing, referral to audiology is required regardless of the tympanometry result.</li> <li>The two positive peak examples on left indicate normal screening results.</li> </ul>

Steps	Additional Information
<p>mmho      Tymp 1000 Hz Left      ml</p>  <p><b>Negative peak – abnormal</b></p> <p>mmho      Tymp 1000 Hz Right      ml</p>  <p><b>Artefact –</b></p> <p>mmho      Tymp 1000 Hz Right      ml</p> 	<ul style="list-style-type: none"> <li>• An absent or negative peak is considered an abnormal result.</li> <li>• Interference due to movement, talking, swallowing or sucking causes artefact in the trace and it cannot be interpreted.</li> </ul>
<p><b>5b. Interpreting results:</b></p> <ul style="list-style-type: none"> <li>• <b><u>Children 6 months and above</u></b> <sup>1, 15</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Consider tympanometry and otoscopy results (and audiometry if applicable), hearing screening</li> </ul>

Steps	Additional Information
<p>Results are classified as follows:</p> <p><b>Type A</b> – Normal middle ear pressure peaks (+50 to -200 daPa), and normal compliance/admittance (0.3 to 1.5 cc). Normal ECV ranges: 0.3 to 0.9 ml for children over 6 months and under 12 years<sup>3, 5</sup>, and 0.5 to 1.5ml for children aged 12 years and over<sup>6</sup>.</p> <p>See examples:</p>  <p><b>Type B</b> – No compliance/admittance (no air pressure peaks), described as ‘flat’ tympanograms.</p>	<p>question responses, and individual health and social in clinical judgement about need for referral and review.</p> <p><b>Type A results</b> Type A tympanograms represent <b>normal</b> ear canal volume, middle ear pressure and compliance/admittance function.</p> <ul style="list-style-type: none"> <li>• <b>Type A</b> tympanogram result represents a properly functioning Eustachian tube and normal middle ear function.</li> <li>• <b>Type As</b> (shallow) tympanogram result with normal ear pressure but reduced compliance/admittance may indicate a stiff middle ear system caused by ossicular fixation with normal middle ear function.</li> <li>• <b>Type Ad</b> (deep) tympanogram result with normal ear pressure but increased compliance/admittance indicates a flaccid or hyper-mobile middle ear system. This may suggest an ossicular subluxation or a healed tympanic membrane perforation.</li> </ul> <p><b>Type B results</b> Type B tympanograms represent a <b>deviation</b> in ear canal volume, middle</p>



Steps	Additional Information
 <p><b>Type B</b> – Abnormally low middle ear pressure indicating Eustachian tube dysfunction.</p> <p>See examples:</p>	<p>ear pressure and/or compliance/admittance function.</p> <ul style="list-style-type: none"> <li>• <b>Type B result with normal ECV</b> usually indicates middle ear effusion. It may also indicate thickened tympanic membrane.</li> <li>• <b>Type B result with high ECV</b> indicates a tympanic membrane perforation, or a patent grommet or T-tube.</li> <li>• <b>Type B result with low ECV</b> may indicate the probe is blocked by wax or a foreign body or is incorrectly placed against the side of the ear canal.</li> </ul> <p><b>Type C results</b></p> <p>Type C tympanograms represent a <b>deviation</b> in ear canal volume, middle ear pressure and/or compliance/admittance function.</p> <ul style="list-style-type: none"> <li>• <b>Type C result with normal compliance/admittance but low middle ear pressure</b> indicates a Eustachian tube dysfunction without middle ear effusion.</li> </ul>

Steps	Additional Information
 <p>The figure contains three separate graphs, each plotting Compliance (cc) on the y-axis (ranging from 0 to 1.5) against Pressure (daPa) on the x-axis (ranging from -400 to +200). Each graph includes a text box with the following parameters:</p> <ul style="list-style-type: none"> <li><b>Graph 1 (Type = C):</b> ECV = 0.9, Comp = 0.8, Pres = -275. The curve shows a broad peak centered around -275 daPa.</li> <li><b>Graph 2 (Type = Cs):</b> ECV = 0.6, Comp = 0.2, Pres = -330. The curve shows a very low, flat compliance across the pressure range.</li> <li><b>Graph 3 (Type = Cd):</b> ECV = 1.3, Comp = 4.8, Pres = -240. The curve shows a very sharp, narrow peak centered around -240 daPa.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Type Cs (shallow) result with reduced compliance/admittance and low middle ear pressure</b> indicates Eustachian tube dysfunction with fluid and air in the middle ear.</li> <li>• <b>Type Cd (deep) result with increased compliance/admittance and low middle ear pressure</b> indicates ossicular subluxation or healed tympanic membrane perforation with Eustachian tube dysfunction.</li> </ul>
<p><b>6. Communicate results with parents</b></p> <ul style="list-style-type: none"> <li>• If parent/caregiver present, discuss tympanometry findings including any concerns.</li> <li>• If parent/caregiver not present: <ul style="list-style-type: none"> <li>○ Contact to discuss if there are any concerns. Ask about recent illnesses.</li> <li>○ Provide results in writing using CHS409-6A <i>Results for parents</i> for SEHA contacts and CHS142 or CHS423A for other contacts.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• If unable to contact parent/caregiver by phone, follow CAHS-CH and WACHS processes to provide effective communication with family.</li> <li>• Discuss relevant strategies with parents/caregiver and with the child: <ul style="list-style-type: none"> <li>○ Nose blowing followed by washing hands and face.</li> <li>○ Chew hard crunchy fruit and vegetables (e.g., carrots or apples) to help open the Eustachian tube.</li> </ul> </li> </ul>

Steps	Additional Information
	<ul style="list-style-type: none"> <li>○ Breathe Blow Cough activities (see Related external resources)</li> <li>○ Encourage breast feeding.</li> </ul>
<p><b>7. Review and referral</b></p> <ul style="list-style-type: none"> <li>● Where a tympanogram represents a <b>deviation</b> from normal: <ul style="list-style-type: none"> <li>○ Consider a review hearing and ear health assessment in 4-6 weeks in cases of recent upper respiratory tract infection</li> <li>○ Provide referral as indicated to audiologist, medical practitioner, Aboriginal Ear, Nose and Throat (ENT) Clinic, speech pathologist or other health practitioner.</li> <li>○ See Appendix A and B for further information regarding review and referrals.</li> </ul> </li> <li>● Discuss and seek consent for referral from parent/caregiver.</li> <li>● Include otoscopy and tympanometry results in referral. Include audiometry results, if conducted.</li> </ul>	<ul style="list-style-type: none"> <li>● Adherence to CAHS-CH and WACHS clinical handover processes is required when handing over a client, or for client referral within or outside of the health service.</li> <li>● Follow up with parents/caregivers to determine if the referral has been actioned.</li> <li>● CAHS CH: The <a href="#">Aboriginal ENT Clinic</a> provides a free specialist ENT service. Nurse to 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> <li>● WACHS: Community Health staff should follow local referral processes as required. This may include referral to local WACHS Child Development Staff, contracted hearing services, or medical practitioners.</li> </ul>

## Documentation

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

References
<ol style="list-style-type: none"> <li>1. Coates H, Kong K, Mackendrick A, Bumbak P, Perry C, Friedland P, et al. Aboriginal, Torres Strait Islander and Pacific Islander Ear Health Manual. Perth: Garnett Passe and Rodney Williams Foundation; 2020.</li> <li>2. Commonwealth Department of Health and Ageing. Recommendations for clinical care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander population. Canberra: Menzies School of Health Research, Commonwealth Department of Health and Ageing; 2011.</li> </ol>

3. Rosenfeld R, JJ. S, Schwartz S, Coggins R, Gagnon L, Hackell J, et al. Clinical Practice Guideline: Otitis Media with Effusion Otolaryngology Head and Neck Surgery. 2016;Vol. 154 (IS) D1-S41.
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5. American Speech-Language-Hearing Association. Screening Guidelines for screening infants and children for outer and middle ear disorders, birth through 18 years. Rockville, MD: American Speech-Language Hearing Association; 1997.
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7. Petrak M. Tympanometry Beyond 226 Hz - What's Different in Babies? . Audiology Online. 2002;Nov 18, 2002.
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10. British Society of Audiology. Interim Safety Advice to Audiologists on Performing Hearing Tests and Fitting Hearing Aids to Patients with a Programmable Ventriculo-peritoneal Shunt (PVP Shunt) British Society of Audiology; 2019 [Available from: <https://www.thebsa.org.uk/interim-safety-advice-to-audiologists-on-performing-hearing-tests-and-fitting-hearing-aids-to-patients-with-a-programmable-ventriculo-peritoneal-shunt-pvp-shunt/>.
11. Government of Western Australia. WA Child Ear Health Strategy. Perth, 2017.
12. Hearing Australia. Tympanometry training for primary health services.
13. Marchant CD, McMillan PM, Shurin PA, Johnson CE, Turczyk VA, Feinstein JC, et al. Objective diagnosis of otitis media in early infancy by tympanometry and ipsilateral acoustic reflex thresholds. The Journal of Pediatrics. 1986;109(October 1986):590-5.
14. Margolis RH, Bass-Ringdahl S, Hanks WD, Holte L, Zapala DA. Tympanometry in newborn infants--1 kHz norms. Journal of the American Academy of Audiology 2003;14(September):383-92.
15. Paediatric ENT Services. TympanometryND. Available from: <http://www.paediatricentservices.com.au/wp-content/uploads/Tympanometry.pdf>.

### Related internal policies, procedures and guidelines

The following documents can be accessed in the CH Clinical Nursing Manual: [HealthPoint link](#) or [Internet link](#) or for WACHS staff in the [WACHS Policy link](#)

Audiometry

Clinical Handover - Nursing

Factors impacting child health and development

Hearing and ear health

Otoscopy
Physical assessment 0 – 4 years
Universal Contact - School Entry Health Assessment
Universal Contacts – 8 week, 4 months, 12 months, 2 years
The following documents can be accessed in the <a href="#">CAHS-CH Operational Manual</a>
Client identification
Consent for services
Hand Hygiene
Infection control manual
The following documents can be accessed in <a href="#">WACHS Policy</a>
Ear tissue spearing, irrigation and ear drop installation procedure
Enhanced Child Health Schedule
The following documents can be accessed in the <a href="#">Department of Health Policy Frameworks</a>
<a href="#">Clinical Governance, Safety and Quality</a>
Clinical Handover Policy ( <a href="#">MP0095</a> )
Clinical Incident Management Policy ( <a href="#">MP 0122/19</a> )
<b>Related CAHS-CH resources (including related forms)</b>
The following forms can be accessed from the <a href="#">CAHS-Community Health Forms</a> page on HealthPoint
CHS142 Referral to Community Health Nurse
CHS409-1 SEHA Parent Questionnaire
CHS409-5 School Entry Health Consultation for Education Support Students
CHS409-6A Results for parents
CHS423 Ear Health Assessment Results
CHS423A School Ear Health Assessment – Results for Parents
CHS663 Clinical Handover/Referral
CHS719 Ear Health Screening Consent
<b>Related WACHS resources</b>

The following resources can be accessed from WACHS Learning Management System Capabiliti
Community health staff
Ear Health Module 1 – Overview (EHOV EL1)
Ear Health Module 2 – Otoscopy (EHOT EL1)
Ear Health Module 3 – Tympanometry (EHTT EL1)
Ear Health Module 4 – Play Audiometry (EHPA EL1)
Ear Health Module 5 – Referrals (EHRE EL1)
Related external resources
<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.
Coates H, Kong K, Mackendrick A, Bumbak P, Perry C, Friedland P, Morrisw P & Chunghyeon. 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.
Hearing Australia. <a href="#">Tympanometry training for primary health services</a> (online training resource).
Related CAHS-CH e-Learning
<a href="#">Aboriginal Cultural eLearning (ACeL) - Aboriginal Health and Wellbeing</a>

## Appendix A: Review and Referral guidance for Hearing and Ear health assessments – Infants under 6 months with Newborn Hearing Screen (NBHS) pass

*Note that clinical judgement may override review and referral guidance covered below*

### Infants < 6 Months

Tympanometry outcome	Hearing surveillance questions – <u>No concerns</u>	Hearing surveillance questions – <u>Concerns identified</u>
<b>Positive peak</b> - Normal result	- No further action required	- If hearing concern present, Audiology referral is required, regardless of tympanometry result.
<b>Negative peak</b> - Abnormal result	Possible middle ear pathology without impact on hearing. - Repeat otoscopy, tympanometry and hearing surveillance questions in 4-6 weeks. - If review results unchanged: <ul style="list-style-type: none"> <li>o - Medical referral</li> <li>o - Advise parent that referral to audiology may be required if concerns arise with hearing and/or speech and language development</li> </ul>	Possible middle ear pathology with impact on hearing. - Repeat otoscopy, tympanometry and hearing surveillance questions in 4-6 weeks. - If results unchanged, for <b>prompt Medical and Audiology</b> referral.
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• <b>ALL</b> 0-6 Month infants who had <u>NO NBHS</u>, or a <u>failed NBHS and did not attend follow-up</u> appointments require: <ul style="list-style-type: none"> <li>- <b>URGENT</b> referral to NBHS Program before cut-off age of 12 weeks*</li> <li>- PCH or regional Audiology referral if aged 12 weeks and over</li> <li>- <b>Prompt</b> Medical referral also, if <u>hearing concerns and negative peak</u> are present.</li> </ul> </li> </ul> <p>* <b><u>Newborn Hearing Screening Pathway</u></b>  “Advise parents that they may attend on an outpatient basis for a NBHS screen <u>before the baby is three months corrected age</u>. However, remind parent that <u>best practice is to screen the baby before one month corrected age</u>.”</p>		

- See [Hearing and ear health](#) guideline for Universal and additional hearing and ear health screening and assessments for WA children.
- Clinical judgement includes consideration of tympanometry and otoscopy results, and hearing screening question responses, and the client’s individual health and social circumstances.

## Appendix B: Review and Referral guidance for Hearing and Ear health assessments: Children 6 months and over

*Note that clinical judgement may override review and referral guidance covered below*

### Children 6 Months and over

Tympanometry outcome	Hearing surveillance +/- Audiometry <b>No concerns and a passed audiometry assessment</b>	Hearing surveillance +/- Audiometry <b>Concerns present and/or failed audiometry assessment</b>
<b>Type A</b> – all types	- No review or referral needed	- If significant parental concerns and/or failed audiometry, Audiology referral is indicated (for possible sensory neural hearing loss)
<b>Type B</b> <small>normal volume</small> - Usually indicates middle ear effusion	- Review in 4-6 weeks - Medical referral if unchanged at review - Audiology referral also required, unless normal hearing confirmed with audiometry.	- Review in 4-6 weeks - Medical and Audiology referral if Type B trace on review <b>NB. Prompt Medical and Audiology referral</b> without review if Bilateral Type B's, and speech delay and/or parental concern about hearing are also present.
<b>Type B</b> <small>high volume</small> - Indicates tympanic membrane perforation or patent grommet	- Grommet in situ: No action required - Perforation: Medical referral, unless perforation is documented and long-standing.	- Audiology and Medical referral
<b>Type B</b> <small>low volume</small> - Indicates blocked probe (wax, foreign body, or positioned on side of ear canal)	- Medical referral for opinion about wax management. - Review otoscopy and tympanometry 1 to 2 weeks post removal of wax or foreign body.	- Medical referral for removal of wax or foreign body - Review 1 - 2 weeks post removal of wax or foreign body. - Audiology referral if hearing has not improved at review.
<b>Type C</b> – all types - Abnormally low middle ear pressure indicating Eustachian tube dysfunction	- Implement Blow, Breathe, Cough program - Review in 4 - 6 weeks - If still Type C on review, advise parent that Audiology referral may be required if hearing and/or speech and language development concerns arise.	- Review in 4-6 weeks - If results unchanged at review, for Medical and Audiology referral.

- See [Hearing and ear health](#) guideline for Universal and additional hearing and ear health screening and assessments for WA children.
- Clinical judgement includes consideration of tympanometry, audiometry and otoscopy results, and hearing screening question responses, and the client's individual health and social circumstances.
- Audiometry is offered to children aged 3 years and over, as developmentally appropriate.



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

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