Queensland Health

Screening Protocols and Guidelines

2016


Revised: May 2017; Review: 2019
Healthy Hearing Mission Statement

The Healthy Hearing Program aims to improve health outcomes for Queensland children through the earliest possible detection and management of permanent childhood hearing loss. Newborn hearing screening is the first stage of a comprehensive approach to communication development which includes further assessment and early intervention. The Healthy Hearing Program aims to systematically monitor its performance and be alert and responsive to emerging evidence in this field.
1. Introduction
The Healthy Hearing Protocols and Guidelines have been produced with the objective of ensuring newborn hearing screening uniformity across all screening sites, both public and private, in Queensland. This document provides an overarching set of protocols and guidelines to achieve consistency of practice across the state.

The layout of these protocols has been designed to allow quick access to relevant sections of the document. To maintain control of this document, screening sites are encouraged to use the online version of the Healthy Hearing Protocols and Guidelines. This assures that they are referring to the most current and correct version of the document. It can be accessed from the Healthy Hearing Website at https://www.childrens.health.qld.gov.au/chq/our-services/community-health-services/healthy-hearing-program/resources/.

1.1 Program Background/Rationale
Permanent childhood hearing loss (PCHL) is a common congenital anomaly. The incidence of PCHL in newborns is more frequent than any other condition included in neonatal metabolic screening, with 1 to 2 babies per 1000 births diagnosed with a significant hearing loss (HL).1,2,3 More than half of children diagnosed with a HL come from the well-baby population, born without any known hearing loss risk factors such as family history or medical conditions associated with HL.

The detection of HL in the first 12 months of life can be difficult without the use of technology and often escapes detection by parents and/or the physician until the child fails to attain language milestones. However, recent technological advancements have produced a range of valid and reliable automated instruments that can now be used to screen newborn babies for hearing loss. Access to these instruments has enabled the establishment of cost-effective screening programs for PCHL such as the Healthy Hearing Program. Prior to the introduction of newborn hearing screening in Queensland, the average age of identification of a HL was approximately 30 months (2.5 years).

Early detection of HL in infants is of paramount importance, with age of identification and age of enrolment in intervention being the key variables for achieving optimal language development. International and local evidence suggests that detection of a HL and commencement of early intervention through hearing aid provision and communication habilitation by the age of 6 months may be critical for speech and language development, and the child's future learning and social outcomes.4

In line with a growing body of research on the importance of early identification of hearing loss, and in response to community initiative, Queensland Health implemented a universal newborn hearing screening program called the “Healthy Hearing Program”. More than 60,000 babies are born in Queensland each year and all Queensland birthing facilities (public and private) offer newborn hearing screening.

1.2 Program Aims
The primary aim of the Healthy Hearing Program is to provide early detection and intervention for babies born with a permanent hearing loss likely to affect speech and language development, by:
- Providing free hearing screening to all babies born in Queensland soon after birth.
- Providing immediate direct referral to Audiology for diagnostic assessment for any babies who receive a second Refer result on their hearing screen.
- Providing targeted surveillance of all babies who receive a Pass result on their hearing screen but present with risk factors associated with late onset/progressive hearing loss.
- Facilitating treatment and / or early intervention for those babies diagnosed with a PCHL.
- Providing ongoing support and information for families of babies diagnosed with a PCHL until the child turns 6 years of age.

1.3 **Program Targets/Benchmarks**


The Healthy Hearing Program has established the following targets:

<table>
<thead>
<tr>
<th>Target Area</th>
<th>Key Performance Indicators</th>
</tr>
</thead>
</table>
| Screening Rates     | **Capture:**  
• All babies born in Queensland birthing facilities (public or private) are offered a hearing screen.  
• 100% of eligible babies are offered hearing screening.  
• <1% of parents decline screening.  
  **Coverage:**  
• >97% eligible babies complete a hearing screen before one month corrected age.  
• 99% of eligible babies will have their screen completed by 3 months corrected age*.  
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Referral Rates      | **Direct refers:**  
• < 2% of babies screened are referred for diagnostic Audiological testing*.  
  o Babies with a ‘Bilateral Refer’ result are offered assessment by Audiology within 2 weeks.  
  o Babies with a ‘Unilateral Refer’ result are offered assessment by Audiology within 6 weeks.  
• All babies with a ‘Refer’ (positive) result are referred for Audiological assessment within 72 hours of the final screen.  
  **Early Targeted Surveillance (ETS):**  
• All identified babies are referred for Audiological assessment within 72 hours of the final screen (Bilateral ‘Pass’ result with craniofacial / syndrome risk factors present).  
• Babies in this category are offered assessment by Audiology within 6 weeks.  
  **Targeted Surveillance referrals:**  
• < 4% of babies screened are identified with risk factors for progressive hearing loss; babies identified with risk factors will be reviewed by their 1st birthday.  
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Parent Support      | >97% babies with a ‘Refer’ (positive) result are referred, monitored and followed up through to diagnostic services and are provided access to key support and advocacy services.                                                                                                                                                                                                                                                                                                           |

* Indicates Queensland nominated benchmark.

The Healthy Hearing Program reports state-wide performance and outcomes which cover the following 4 key nominated themes outlined in the National Framework. These areas are:

- Participation and recruitment;
- Screening and identification;
- Assessment and diagnosis;
- Early intervention and management.

1.4 **Governance, Program Responsibilities and Devolution to Hospital Health Service (HHS) Entities**

The Healthy Hearing Program utilises universal equipment and nursing/midwifery staff to perform hearing screens on all babies born in both the public and the private sectors in Queensland. The model endorsed ensures a high level of service delivery, able to identify and respond to common challenges and needs in a consistent way regardless of geographical and local boundaries. This model supports state-wide uniformity, equitable access and a standardised level of care.

The Healthy Hearing Program state-wide team are responsible for:
• Partnering with national and international newborn and paediatric exemplars to share knowledge and ensure Queensland infants receive contemporary high value care.
• Setting the strategic direction for the program.
• Developing and maintaining standardised policy and program standards.
• State-wide monitoring and reporting to State and National bodies.
• Auditing and evaluating service delivery and outcomes, and quality improvement reviews.
• Funding and contractual management with Private birthing hospitals.
• Providing contemporary educational resources for training purposes.
• Reviewing and overseeing the introduction of new technologies (this transcends the traditional HHS boundaries and interfaces with governance function of HHP team).
• Liaising with screening and audiology sites to assist in the co-ordination of care where necessary for babies transferred between hospital facilities and agencies.

The Public Hospitals within each HHS and the Private Hospitals are responsible for:
• Day-to-day operational delivery of newborn hearing screening.
• Timely referral to appropriate Screening, Audiology and Family Support teams.
• Delivery of diagnostic audiology and appropriate medical services where designated.
• Delivery of high quality care consistent with appropriate clinical interventions.
• Supporting consumers and families to become more knowledgeable and informed.
• Ensuring the screening service is performed by well trained, competent Nurses and Midwives in accordance with HHP Policies and Guidelines and within Scope of Practice requirements.
• Ensuring screening equipment is managed under a current Service Maintenance agreement.
• Providing local leadership in regards to all matters relating to newborn hearing screening.

Screening is only to be performed by Nurses and Midwives registered by Australian Health Practitioner Regulation Agency (APHRA) and must be directly employed by the facility.

Local Healthy Hearing Program co-ordination role will be the responsibility of a Clinical Nurse equivalent. The role involves:
• Healthy Hearing Database management.
• Tracking of every birth, transfers-in and transfers-out of the facility.
• Monitoring of local decline rate.
• Monitoring of local screening coverage rates, and referral rates to Audiology for assessment.
• Facilitating training and education of new staff, and ongoing development of team knowledge and skills.
• Monitoring compliance of annual screener competency assessments.
• Monitoring usage and stock of screening consumables (ear couplers/hugs and sensors).
• Awareness of, and advocacy for, Service Maintenance coverage for local devices.
• Acting as a resource person for the Healthy Hearing Program to promote awareness and benefits of screening to peers, patients and wider community.

2. Healthy Hearing Screening Criteria & Logistics

2.1 Screening Eligibility Criteria

As a general principle, all newborns should be screened. However, in some situations the screen may need to be delayed and in rare situations screening may not be possible at all or is medically inadvisable.

2.1.1 Eligibility/Baby Selection for Screening

To be eligible for a free hearing screen, a baby must:
• Be eligible/ enrolled for an Australian Medicare Card in the first instance
• Have been born or transferred to a Queensland birthing facility accredited to perform screening
• Be an eligible Home birth (by meeting eligibility for an Australian Medicare card)
• Non Medicare eligible families may incur financial costs for the screen
• Be between 34 weeks gestational age and ideally 1 month corrected age, however babies born prematurely can be screened up to 3 months corrected age (screening outside these timeframes can be considered after consultation with the area co-ordinator).
• Have normal outer ear anatomy for both ears and no other major cranio-facial abnormalities (as outlined in the Exclusions below in section 2.1.2).
• Be asleep or in a quite settled state and recently fed or feeding.
• Be medically stable and have completed any antibiotic or phototherapy treatment.
• Be ready for discharge home within the next three to five days if in a NICU or special care nursery.
• Have had informed parental consent obtained.

If a baby is in theory eligible for a screen but for technical reasons is unable to be screened (e.g. ears are too large for ear couplers/hugs), they should be referred directly to Audiology for assessment.

2.1.2 Exclusions
In rare situations, screening may not be possible or is medically inadvisable. These babies are referred directly to Audiology for assessment. The decision to exclude a baby from the screening program must be made by the treating clinician. Such situations include:
• When it is medically inadvisable to attach the sensors and/or ear couplers/hugs, e.g. if the baby has compromised skin.
• The presence of a major craniofacial abnormality, in particular the obvious malformation or absence of outer ear anatomy, including babies with unilateral or bilateral microtia/atresia. For babies with only 1 normal-looking ear, do not screen the ‘good’ ear even if this is requested by the treating clinician. The Area Co-ordinator or Head Office will provide additional information and support as required.
• Other conditions which medical staff deem as requiring a full diagnostic assessment by Audiology.

2.1.3 Screening to be Delayed/Postponed
Healthy Hearing screening should be delayed in the following situations:

<table>
<thead>
<tr>
<th>Baby's condition</th>
<th>When to Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby is less than 34 weeks gestational age.</td>
<td>When baby is ready for discharge (not as soon as they reach 34 weeks gestational age).</td>
</tr>
<tr>
<td>Medically unstable.</td>
<td>When baby is healthy enough for discharge.</td>
</tr>
<tr>
<td>Being treated for hyperbilirubinaemia (e.g. under phototherapy).</td>
<td>After treatment is ceased.</td>
</tr>
<tr>
<td>Receiving/withdrawing from drugs that affect the central nervous system, unless being discharged on the medication.</td>
<td>After treatment is ceased.</td>
</tr>
<tr>
<td>Being treated with potentially ototoxic medications (e.g. gentamicin/vancomycin).</td>
<td>Once medication is ceased.</td>
</tr>
<tr>
<td>On a ventilator or in an incubator.</td>
<td>When baby is healthy enough for discharge.</td>
</tr>
<tr>
<td>Persistently agitated or irritable.</td>
<td>Once baby has settled.</td>
</tr>
</tbody>
</table>

2.2 Screening Equipment
The Queensland Healthy Hearing Program conducts hearing screening using the AccuScreen Newborn Hearing Screener. This device is mobile and non-invasive, utilising Automated Auditory Brainstem Response (AABR) technology to assess the auditory system from the external ear to the auditory brainstem.

The AccuScreen operates by delivering soft chirp / clicking sounds to the baby’s ears via disposable earphones (called couplers / hugs). Each “chirp” stimuli evokes a series of identifiable nerve responses from the auditory nerve and brainstem. This neural activity is known as the Auditory Brainstem Response (ABR). Sensors applied to the baby’s skin pick up the neural response to sound,
and transmit the signals to the AccuScreen device. It then analyses the baby’s neural response to determine if it is consistent with a template within the screening device which is derived from ABRs of normal-hearing infants. The AccuScreen detects the ABR waveform with high statistical confidence to determine that a response is either present or absent.

Screening will always occur in simultaneous binaural mode (2 ears tested at the same time) and all repeat screens for any “refer” result will be binaural mode. One ear screening is not permitted under any circumstance.

The devices generate either a Pass ✓, Refer ✗, or an Incomplete ☐ result for each ear¹. The results are known immediately and no interpretation of results is required by the screener. A typical screen should take a maximum of 4-5 minutes. An average screening time is 2 minutes.

If ☐ result occurs, the screen is considered Incomplete. A restart may be attempted following successful troubleshooting interventions up to a maximum number of 3 attempts at any one screening episode (initial start and then 2 immediate restarts when troubleshooting undertaken). If the screen cannot be completed after three attempts, then it is not an appropriate time to screen this baby. Restarts are documented on the Screening and Referral form Page 2 (this is useful for other screeners if they are required to perform a screen on the baby).

A screening episode (AABR1 / AABR2) is not considered complete until there is a recorded Pass ✓ or Refer ✗ outcome for each ear displayed on the AccuScreen device. Result/s displaying an Incomplete outcome ☐ must be repeated.

2.3 Screening Location

The Healthy Hearing screen can be performed in any relatively quiet location including;
- at the mother’s bedside in the Postnatal ward;
- in a designated hearing screening room, or Outpatient clinic room;
- special care or well-baby nursery;
- office area or clinician’s room;
- the baby’s home;
- other community setting such as Child and Maternal Health clinic;
- Paediatric ward in some agreed situations.

Parent/s are encouraged to be present at the hearing screen, but the screen can be conducted in their absence providing they have agreed to this arrangement. If separated, baby’s ID wrist bands are to be cross checked with the mother when re-united in accordance with local hospital policy and process.

2.4 Screening Staff

The Healthy Hearing screen is to be undertaken by a Midwife, Registered Nurse or Enrolled Nurse who has completed an approved Healthy Hearing education program and achieved competencies in performing the hearing screen using the AccuScreen. AINs are not eligible to be trained to perform hearing screens.

In some circumstances, the Healthy Hearing screen may also be performed by Indigenous Health Workers who have undertaken the approved Healthy Hearing training program.

Screening staff are responsible for:
- Obtaining informed consent from parent/s.
- Performing hearing screens.
- Explaining results to parent/s.
- Documenting results.
- Exporting data from the AccuScreen as per local protocols.
- Actioning referrals to Audiology and the Queensland Hearing Loss Family Support Service.

2.5 Screening Timeframe

To ensure high capture rates, screening should be performed during the birth admission. The screen can be performed from 6 hours after birth in accordance with the manufacturer’s advice. The Screener will be mindful not to interrupt the Baby Friendly Hospital Initiative (BFHI) first few hours of bonding. Very early screening has the potential for false refer outcomes due to presence of birth fluid and debris in the ear canals.

The optimum timeframe is from 12 - 24 hours after birth if the baby’s discharge home is imminent. Alternatively 24 - 48 hours after birth if the baby is still an inpatient. Where a Refer result is obtained for the AABR1, a time period of at least 12 to 24 hours should elapse before repeating the screen (AABR2). The program does not support immediate repeat screening following a Refer outcome.

Where babies are discharged prior to completion of the hearing screening process, arrangements should be made to complete the hearing screen as soon as possible via a return visit for a scheduled outpatient appointment or during a home visit by an early discharge nurse, who has been trained and is competent in performing the hearing screen.

The screening process should be completed before the baby reaches 1 month corrected age for well healthy babies, and by 3 months corrected age for sick and premature babies.

Babies who are older than 3 months corrected age and remain an inpatient should be referred to Audiology as a “medical exclusion” for ABR assessment when stable.

2.6 Screening Resources & Ordering Processes

Resources have been developed to assist the screening process and to promote the Healthy Hearing Program (refer to the table below).

<table>
<thead>
<tr>
<th>Resource</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Hearing Forms</td>
<td>Consent Form • Used to obtain and document parental consent for screening.</td>
</tr>
<tr>
<td></td>
<td>Screening &amp; Referral Form (S&amp;R Form) • Used to document screening information: including screening results &amp; hearing loss risk factors.</td>
</tr>
<tr>
<td></td>
<td>• Used to refer babies on to Audiology and QHLFSS.</td>
</tr>
<tr>
<td>Brochures</td>
<td>‘Your baby’s free hearing screen’ • Provides parents with information about the hearing screen and is used to obtain consent.</td>
</tr>
<tr>
<td></td>
<td>‘Your Baby’s Audiology Hearing Test’ • Given to parents of babies referred to audiology for diagnostic hearing assessment.</td>
</tr>
<tr>
<td></td>
<td>‘Your Baby’s Follow Up Hearing Test’ • Given to parents of babies who have obtained a bilateral Pass result on screening, but have hearing loss risk factor/s requiring Targeted Surveillance.</td>
</tr>
</tbody>
</table>
The Healthy Hearing website provides information about how to order these resources, and also includes consent forms and brochures in translated languages. The web address is: https://www.childrens.health.qld.gov.au/chq/our-services/community-health-services/healthy-hearing-program/resources/

Sites should refer to the Healthy Hearing site, as it always provides the most current versions of the program’s resources.

3. Healthy Hearing Screening Medico-Legal Issues & Documentation

3.1 Consent

Informed consent is required for this program, and may be given by:

- Either parent / guardian.
- The Department of Child Protection.
- A person nominated by the Family Court.
- The treating consultant if parent is unable to be located/contacted.

In order for parents to give informed consent, they must first be given:

- A copy of the brochure ‘Your baby’s free hearing screen’.
- Verbal explanations of the screening process, potential results and follow up procedures.
- An opportunity to ask questions.

Before signing the Healthy Hearing Consent Form, the parent/carer is to be given a verbal overview of the content of the form including key inclusions such as:

- The need for ongoing parental monitoring of hearing due to a small chance of a hearing loss not being detected by the screen or developing later in life.
- Implications of not having the hearing screen.
- Notification of results to other professionals if further assessment is required.
- Baby's results to be recorded on a database for follow up and/or research.
- An opportunity to read the form fully if they wish.

If parent/s do not speak and/or read English, a trained/accredited interpreter will be required to obtain consent and inform parents of the results of screen and follow-up actions if required. Translated brochures and consent forms are available in a range of languages on the Healthy Hearing webpage at https://www.childrens.health.qld.gov.au/chq/our-services/community-health-services/healthy-hearing-program/resources/.

A sample Healthy Hearing Consent Form is included in Appendix 2.

3.2 Hearing Screen Declined by Parents

A parent’s decision to decline the hearing screen is respected. However, it is appropriate to ascertain reasons for declining, and to correct any misunderstandings regarding the hearing screening process and/or risks to the baby. It is also important that parents be fully informed of the potential implications should their baby have an undetected hearing loss.

Where the parent/s continues to decline the screen, the screener is required to:

- Request the parent/s sign the Healthy Hearing Consent form, ticking the ‘I DO NOT consent to my baby having the hearing screen’ box. If a parent refuses to sign the form or the screen is declined by phone, this must be documented on the consent form and filed in the baby’s chart.
- Record the decline on the S&R form, ticking the ‘Baby not screened’ and ‘Declined’ boxes.
- File the Consent and the S&R forms in the baby’s medical record, and document the decline on the baby’s clinical pathway (if used).
- Arrange a letter to the baby’s medical practitioner advising that the screen was declined, and advising of any risk factors for hearing loss.
• Advise parents that ideally babies should be screened within 1 month corrected age, but they may return for the screen before the baby is 3 months corrected age on an outpatient basis should they change their mind. The hospital contact phone number and details should be provided on the ‘Your baby's free hearing screen’ brochure.

3.3 Surrogacy Consent

In the instance of a surrogate birth, the legal guardianship of the newborn baby remains with the birth mother or birth mother’s spouse until such time as a parentage order has been made. Until this order is in place, all consent for screening, audiology or treatment must be provided by the birth mother, not the intended parents. This form (SW549) outlines the required consent responsibilities prior to the parentage order and after the parentage order exists (Appendix 2).

3.4 Screening & Referral Form (S&R Form)

The Screening and Referral Form (S&R Form) is completed for all live births regardless of whether or not the baby completes the hearing screen. This form serves several purposes, including;

- The collection of demographic information.
- The recording of relevant medical history, e.g. the presence of specified risk factors.
- Provision of a template for entering data into the relevant fields on the AccuScreen.
- A referral form to audiology for immediate diagnostic assessment.
- A referral form to audiology for follow-up assessment due to the presence of specified risk factors.
- A referral form to the Queensland Hearing Loss Family Support Service.
- A documentation record of the hearing screen results and/or other follow-up actions.

The Baby's Details and High Risk Indicators sections are completed by referring firstly to the medical chart rather than just asking the mother or family. The chart provides a more reliable source of information, protects the patient’s privacy and may reduce unnecessary embarrassment when discussing sensitive topics. The exception is collection of information on Family history of permanent childhood hearing loss. This usually requires discussion with the parent/s or the family as this aspect of medical history is often not well documented in the medical record.

Hearing loss risk factors include:

- Family history of permanent childhood hearing loss.
- Syndromes associated with hearing loss (e.g. Down & Pierre Robin).
- Prolonged ventilation ≥ 5 days (IPPV / CPAP / HHFNCT).
- Bacterial meningitis.
- Severe asphyxia at birth (convulsions / HIE / PPHN).
- Craniofacial anomalies e.g. cleft palates (excluding cleft lips and skin tags).
- Hyperbilirubinemia – maximum SBR levels ≥450μmol/l (Term) or ≥340μmol/l (Preterm).
- Perinatal infection of the baby (confirmed / suspected) - Toxoplasmosis, Rubella, CMV, Herpes, Syphilis.
- Professional concern/major medical concerns / Chemotherapy – details of the specific concern must be recorded.

Where a baby dies or is transferred out for medical reasons before the hearing screen process has been commenced, the high risk indicators can be left blank.

Screening and Referral (S&R) forms should be uploaded into the Child Record on QChild for any Direct, Early Targeted Surveillance, and Targeted Surveillance referrals. The S&R form should also be uploaded if a baby is transferred to another hospital. This allows all clinicians access to the form.

If a baby’s family declines the screen or fails to attend scheduled screening appointment/s, all sections of the form, except the Screening Results, are to be completed.

The Notes page is used to record further information about the hearing screen history, such as:

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• Failure to attend appointments.
• Attempts to contact parent/s to arrange appointments.
• Additional information or advice sought from medical practitioners, audiologists or others regarding high risk indicators, etc.

The completed form is filed in the nominated section of the baby's medical chart.

A copy of the Screening and Referral form can be located in Appendix 2.

3.5 Additional/General Documentation
Additional and general documentation associated with the Healthy Hearing processes include:

<table>
<thead>
<tr>
<th>Documentation</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Health Record (PHR) Book</td>
<td>Hearing screen results are to be recorded on the appropriate page in the baby's PHR Book. Any risk factors and follow up actions required such as AABR2 or Audiological assessment are also recorded.</td>
</tr>
<tr>
<td>Documentation in Charts/ Clinical Pathways</td>
<td>Record the results of the hearing screen on the baby's/mother's Clinical Pathway (if used). Otherwise, follow local protocols for additional documentation requirements.</td>
</tr>
<tr>
<td>Standard Letters</td>
<td>Standard letters have been developed to assist in follow-up, referral and tracking of babies who have been screened in the HHP.</td>
</tr>
<tr>
<td>Audiology Brochures</td>
<td>If a baby is referred to Audiology for diagnostic or surveillance assessment, the name and contact details for the relevant Audiology service should be recorded on the relevant brochure that has been given to parents.</td>
</tr>
</tbody>
</table>
4. Screening Protocol/Pathways

4.1 Screening Pathways

The diagram below illustrates the basic screening protocol.

- **Eligible to screen**
  - Medically stable
  - Older than 34 weeks GA near to discharge
  - Parental consent obtained
  - Inpatient / Outpatient

- **Ineligible to screen**
  - Exclusion to screening
    - Abnormal ear anatomy on any ear - Microtia / Atresia
    - Older than 3 months CA
    - Medically unstable

- **AABR1 1st Screen**
  - PASS both ears
    - No risk factors
    - Discharge
    - Parental & GP monitoring
  - PASS both ears
    - Risk factors
    - REFER to Audiology for Surveillance assessment:
      - Appointment within 6 weeks for Early Targeted Surveillance
      - Appointment before baby’s 1st birthday for Targeted Surveillance
      - Parental & GP monitoring
  - REFER result
    - One or both ears
    - Medically stable
    - Older than 34 weeks GA near to discharge
    - Parental consent obtained
    - Inpatient / Outpatient

- **AABR2 2nd Screen**
  - PASS both ears
    - No risk factors
    - Discharge
    - Parental & GP monitoring
    - Discuss Otitis Media risk
  - PASS both ears
    - Risk factors
    - REFER to Audiology for Surveillance assessment:
      - Appointment within 6 weeks for Early Targeted Surveillance
      - Appointment before baby’s 1st birthday for Targeted Surveillance
      - Parental & GP monitoring
    - Refer to Queensland Hearing Loss Family Support Service
  - REFER one or both ears
    - Medically stable
    - Older than 34 weeks GA near to discharge
    - Parental consent obtained
    - Inpatient / Outpatient

- **AABR3 3rd Screen**
  - PASS both ears
    - No risk factors
    - Discharge
    - Parental & GP monitoring
    - Discuss Otitis Media risk
  - PASS both ears
    - Risk factors
    - REFER to Audiology for Surveillance assessment:
      - Appointment within 6 weeks for Early Targeted Surveillance
      - Appointment before baby’s 1st birthday for Targeted Surveillance
      - Parental & GP monitoring
    - Refer to Queensland Hearing Loss Family Support Service
  - REFER one or both ears
    - Medically stable
    - Older than 34 weeks GA near to discharge
    - Parental consent obtained
    - Inpatient / Outpatient
4.2 Referral Processes
The table below summarises the referral processes, dependent upon the screening outcome.

<table>
<thead>
<tr>
<th>Referral to</th>
<th>Action Required</th>
</tr>
</thead>
</table>
| Clinician Override or Medical Exclusion to Screening = Immediate Direct Refer to Audiology | - A medical practitioner may make the decision to refer a baby directly for audiology testing without undergoing the initial AABR1 process. Notations are required in medical chart notes. The Consent Form and S&R Form are to be completed and forwarded to the relevant Audiology service (usually via fax). Local protocols should be followed. In the private sector, a referral from the baby's paediatrician/medical practitioner may also be required.  
  - Babies with microtia / atresia are excluded from screening and are considered a Direct refer, to be seen at Audiology within a 2 week timeframe.  
  - QHLFSS referral is made by forwarding a copy of the Consent Form and S&R Form, including Notes page if relevant, to the QHLFSS Brisbane Office (usually via fax).  
  - Provide parents with the brochure ‘Your Baby’s Audiology Hearing Test’.  
  - Upload S&R Form and Consent Form to the ‘Notes & Admin’ section of baby’s QChild database record.  
  - The Audiology service must be added as a Professional Contact on the child’s QChild record, and a referral created to the Audiology service as soon as possible, to allow audiology to access the baby’s QChild record. |
| Refer on AABR2/AABR3 = Immediate Direct Refer to Audiology** | Refer baby for immediate diagnostic assessment to an appropriate paediatric audiology service. A list of appropriate public Audiology services is available on the HH website at https://www.childrens.health.qld.gov.au/chg/our-services/community-health-services/healthy-hearing-program/screening/  
  - Private Audiology services are also available.  
  - Audiology referral is made by sending (usually via fax) a copy of the Consent Form and S&R Form, including Notes page if relevant, to the approved Audiology service. In the private sector, a referral from the baby’s paediatrician/medical practitioner may also be required.  
  - QHLFSS referral is made by forwarding a copy of the Consent Form and S&R Form, including Notes page if relevant, to the QHLFSS Brisbane Office (usually via fax).  
  - Provide parents with the brochure ‘Your Baby’s Audiology Hearing Test’.  
  - Upload S&R Form and Consent Form to the ‘Notes & Admin’ section of baby’s QChild database record. |
| Pass with Risk Factors = Refer to Audiology for Early Targeted Surveillance or Targeted Surveillance** | Babies who have obtained a Pass result in their hearing screen but are identified with specific risk factors are referred to paediatric Audiology for assessment. The screener is to forward the referral to Audiology immediately, however the exact timing of the assessment depends on the risk factors present, & will be determined by the Audiology service. Early Targeted Surveillance referrals (i.e. craniofacial anomalies and syndromes associated with hearing loss) are assessed by audiology within 6 weeks. All other risk factors (i.e. Targeted Surveillance referrals) are reviewed by the baby’s 1st birthday.  
  - Audiology referral is made by forwarding a copy of both the Consent Form and S&R Form, including Notes page if relevant, to the approved Audiology service, usually via fax, following local protocol.  
  - Provide parents with the brochure ‘Your Baby’s Follow Up Hearing Test’. Record name & contact details for the Audiology service on the brochure.  
  - Upload S&R Form and Consent Form to the ‘Notes & Admin’ section of baby’s QChild database record.  
  - Do not refer these babies to QHLFSS. Audiology will arrange referral to QHLFSS, if a diagnosis of permanent hearing loss is made. |

**Note: when the raw screening data is imported into QChild, automated QChild referrals to Audiology and QHLFSS are made according to the screening protocol and pathway.
4.3 When the Hearing Screen is Not Initiated or Completed in Hospital

If a screening process is not started or completed in hospital due to an early discharge, the baby should be offered an alternative arrangement such as an outpatient clinic appointment or an early discharge service as soon as possible. Arrangements may be made for the baby to be screened at another hospital if this is more convenient. The process should follow the same inpatient AABR1 & AABR2 protocol. Every effort should be made to screen these babies without increasing the lost to follow up rate. The referring site is required to upload the S&R Form to the QChild database record and also enter information in the ‘Notes & Admin’ section of the QChild record.

The agreed arrangement is to be documented in the ‘Follow up Actions’ section of the S&R Form following discussion with the mother. Any additional information or changes to the agreed plan/appointments are to be recorded on the ‘Notes’ page of this form.

If efforts to arrange a hearing screen are unsuccessful, a standard letter is to be sent to the parents providing them with information about future options for accessing hearing screening. Where all efforts to arrange a hearing screen are unsuccessful, a letter is to be sent to the baby’s GP notifying them that the baby has not received a hearing screen, listing any risk factors evident for the baby.

4.4 Unusual Circumstances Requiring an Additional Screen or Direct Referral to Audiology

Listed below are circumstances which fall outside of the usual screening and referral pathway.

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Action</th>
</tr>
</thead>
</table>
| Flip/Flop result                                 | - Occurs when a Refer result is obtained for one ear and a Pass for the other ear on the first screen (AABR1), then the results for each ear are reversed on the second screen (AABR2).  
  - A third screen should be conducted (AABR3) following the same AABR2 protocol and results documented on S&R Form and in the inpatient medical notes in accordance with local protocols. |
| Raised/rebound serum bilirubin levels of the baby | - Re-screening is required for any baby who has completed the hearing screen and received a ‘Pass’ result for both ears, but subsequently during their birth admission develops serum bilirubin levels ≥ 450 umol/l for a term baby and ≥340 umol/l for a preterm baby.  
  - High risk indicators/s will need to be modified at the time of re-screening and referral to Audiology for follow up surveillance.  
  - Babies discharged from their birth admission and readmitted to hospital for any reason, including hyperbilirubinemia, should be referred by the treating clinician to Audiology if deemed necessary, according to usual referral pathways and medical protocols, or back to the screening program for a repeat screen in those sites where it is the policy to do so. |
| Previously screened baby prescribed antibiotics post-screen | - Re-screening is required when a baby who has completed the hearing screen with a ‘Pass’ result for both ears, but subsequently during their birth admission is prescribed ototoxic antibiotics (e.g. gentamicin/vancomycin).  
  - The re-screen should be performed prior to discharge from hospital or as an Outpatient, after the antibiotics have been ceased. |
| Screening device malfunction                      | - Where it is realised at the completion of the screen that a ‘Refer’ result has been caused by a technical problem that is readily identified and corrected on site, such as a loose or partially disconnected cable or a dislodged ear coupler/hug, a repeat screen should be conducted as soon as possible.  
  - An explanation should be provided to the family. |
| Incorrect ear coupler placement                   | - If placement of the Right and Left ear transducers has been reversed; the screen should be terminated, placement corrected and screen re-started. If a Pass/Refer result has already been given for one or both ears, both ears must be rescreened.  
  - The initial screen attempt should be considered invalid, with the reason being documented on the ‘Notes’ page of the S&R Form.  
  - The screener is to discuss the action with the family as appropriate. |
• Where a Pass or Refer result is obtained for the invalid screen in at least 1 ear, the electronic record should be retained as part of the baby’s screening history, with an explanatory note entered on the screening database.
• The local HH data manager must be notified of the situation.

### 4.5 Detailed Summary of Potential Result Combinations, Follow-up Actions & Documentation

A detailed summary of possible outcomes of screening, follow up actions and documentation required is available in Appendix 3.

### 5. What to Say to Parents - Screener’s Scripts

The Healthy Hearing Program has developed a series of standardised ‘scripts’. These are to be used by screeners when talking to parents in various situations. The rationale for developing these standardised scripts is to ensure the information and explanations provided by staff performing the hearing screens:

- Is consistent between screeners & between facilities;
- Is simple but clear & comprehensive;
- Is accurate, correct terminology is used; and
- Reduces the opportunity for misinterpretation of information by parents.

The Healthy Hearing ‘scripts’ may be varied somewhat to suit individual situations and communication styles. Scripts have been developed for a number of scenarios including:

- Offering a hearing screen.
- Gaining consent.
- Screening outcomes.

A summary of various hearing screen scenarios and key content areas, along with sample scripts to guide screeners when speaking to parents for each scenario, are provided in Appendix 4.

### 6. Troubleshooting to Reduce Screening Times & False Refers

The troubleshooting guide available in Appendix 6 should be used to complement existing troubleshooting guides developed by Otometrics. These guides assist both individual screeners and sites to achieve best practice, by minimising screening times and reducing false refers.

### 7. Site Responsibility for Equipment Care, Cleaning and Maintenance

The following table details the activities required to maintain the equipment used for hearing screening. If at any time you suspect the AccuScreen is not functioning properly, or any parts appear damaged, do not use it. Call Otometrics Technical Service or your HH Area Co-ordinator for help.

<table>
<thead>
<tr>
<th>Item / Tasks</th>
<th>Required Action</th>
</tr>
</thead>
</table>
| AccuScreen Device and Consumables | • Use only AccuScreen screening supplies as per manufacturer recommendations.  
• Consumables (ear couplers, hugs & sensor tabs) are single use only. If the baby requires a new screen, new ear couplers / hugs and sensor tabs are used.  
• Check expiry dates on consumables before use.  
• Any problem with sensor tabs/ear couplers or hugs should be reported to Otometrics and/or the area co-ordinator. Note the batch number and expiry date of the item/s. Faulty packs may be returned to Otometrics for replacement.  
• Notify your site co-ordinator of any equipment failures, who will forward a fault notification to Area Co-ordinators and Head Office to track fault trends.  
• AccuScreen devices should be placed on the docking station when not in use.  
• There is a Standing Order Agreement with Otometrics a division of Natus Medical Pty Ltd in place for the supply of AccuScreen equipment & screening consumables. Sydney head office phone 02 9111 5551. |
### Cleaning Equipment
- Infection control protocols apply to the hearing screening equipment and associated consumables. Standard precautions and principles of asepsis are used when performing the hearing screen.
- Parents may keep the used ear couplers/hugs if they wish. Otherwise the ear couplers/hugs and sensors must be disposed of following each hearing screen.
- After each screen, all cables must be appropriately cleaned, according to local hospital protocols. For detailed guidance, refer to the AccuScreen guide in Appendix 7.
- At completion of screening for the day, the sensor clips should be cleaned using an Alco-wipe.

### Routine Equipment Checks & Maintenance
- Screening sites are required to undertake routine equipment checks and maintenance on a **daily basis** at the start of each screening day, or when screening is required at smaller sites.
- Equipment checks:
  - Perform a full equipment check using the AccuScreen Quality Test Kit (electrode cable and ear coupler/hug cable).
  - Perform a visual examination of the cables, connections, electrical cords, trolley and device for any signs of damage or defects.
- If the equipment fails any of the checks, contact the technical section at Otometrics (02 9111 5550) for advice and notify area co-ordinator.
- Leave the AccuScreen in the docking station with power cord ON when not in use.
- The AccuScreen should provide 8 hours of screening when fully charged.

### Acoustic Cables Calibration
- The AccuScreen acoustic cable (Acoustic Transducer/Ear Coupler/Hug Cable) is to be calibrated **every 12 months** in accordance with manufacturer recommendations.
- It is the combined responsibility of Otometrics and the local Healthy Hearing Team Leader/Co-ordinator to ensure that the annual calibration is completed in a timely manner. In addition, faulty cables should be replaced immediately.
- Calibration will be performed onsite at the screening facility when possible.
- Do not send any cable by courier unless instructed to do so by Otometrics.
- The calibration sticker will be attached to the cable, and also to the device, and will clearly nominate the “month due” for the next calibration.
- Details of the newly exchanged cable number and next calibration due date is to be logged on the site facility database (when available).

---

**Important note:** Whenever an AccuScreen leaves your site or you receive a replacement/loan device, you must inform Healthy Hearing Head Office immediately as device numbers at your site will need to be adjusted in the QChild database.

### 8. Healthy Hearing Information System - QChild

The Healthy Hearing Program’s information system, called QChild, is designed to facilitate ongoing management of babies and reporting to Queensland Health. It allows the department to monitor the Program and ensure that the goals and objectives are being achieved. It also aims to ensure accurate and timely information is available to other professionals involved with the child and family.

In particular, QChild enables:
- Data on babies screened to be stored and aggregated.
- Analysis of information collected to:
  - Identify any babies who have missed or not completed the screening process;
  - Compare outcomes against program targets;
  - Identify any quality assurance or training needs;
  - Identify trends and other resource requirements;
  - Undertake research (de-identified data).
- Referrals to be made to Paediatric Diagnostic Audiology Services and the QHLFSS.
Each facility must nominate a HH database manager at Clinical Nurse equivalent level, to manage/oversee the local database, including the tasks listed in the table below (this is usually the HH Site Co-ordinator). The database manager is required to undertake a formal QChild training program. A comprehensive user guide will be provided as part of this training.

<table>
<thead>
<tr>
<th>Task</th>
<th>Frequency of completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>The screener is to ensure demographic &amp; risk factor data is entered correctly into the AccuScreen, using the S&amp;R form as a template.</td>
<td>• At the time of performing the screen for babies as they are to be screened, or in preparation for performing a screen at a later time.</td>
</tr>
<tr>
<td>Ensure that data is exported from the AccuScreen regularly. Note: Refer results on AABR2 are to be exported within 72 hours of the screening date.</td>
<td>• At least weekly in very small sites. • Daily or weekly in larger facilities as appropriate.</td>
</tr>
<tr>
<td>Ensure that exported data is saved onto a network drive and imported/ uploaded into the database on a regular basis.</td>
<td>• At least weekly in very small sites. • Daily or weekly in larger facilities.</td>
</tr>
<tr>
<td>Import data into the database at regular intervals ensuring it matches to demographic data imported centrally each day from the Client Directory, and clean data.</td>
<td>• At least weekly in very small sites. • Daily or weekly in larger facilities.</td>
</tr>
<tr>
<td>Cleaning data &amp;/or completing data entry for records downloaded from the AccuScreen.</td>
<td>• At least weekly in very small sites. • Daily or weekly in larger facilities.</td>
</tr>
<tr>
<td>Troubleshooting where Client Directory data does not match to an accompanying screen.</td>
<td>• At least weekly in very small sites. • Daily or weekly in larger facilities.</td>
</tr>
<tr>
<td>Running reports.</td>
<td>• At least monthly in all sites. • More frequently in larger facilities.</td>
</tr>
<tr>
<td>Reviewing the database to identify any quality assurance issues requiring intervention.</td>
<td>• At least monthly in all sites. • More frequently in larger facilities.</td>
</tr>
</tbody>
</table>

8.1 Data Entry

It is important that data is entered using the approved codes as per the S&R Form, to avoid incorrect codes and data entries that cannot be accepted by QChild. Entries should be checked for spelling and accuracy by the screener.

If a screener becomes aware that they incorrectly entered data after they have completed the screen, they should notify the Site Co-ordinator, providing the details of the error together with the correct information. The data manager will then correct the record once it is uploaded into the database.

Where an additional screen has been conducted for any reason, this record should be retained on the database as an accurate reflection of the screening history for each baby.

8.2 Reporting Requirements

Data entry must be finalised within a timely manner (ideally weekly) to facilitate access and review by area/state-wide Co-ordinators. It is important to remember that data with referrals to audiology must be prioritised. National KPIs recommend electronic records are made available to Audiology within 72 hours of the screening Refer result.

The local Site Co-ordinator should also run a report at least monthly to identify any issues requiring intervention including:

• Data entry;
• Timeliness of screening of babies;
• Refer result rates;
• Missed or ‘In Process/ needs screen’ records;
• Track older ill babies approaching 3 months corrected age limit;
• Finalise parental declines & send letters to family & GP;
• Finalise inter hospital referral/transfers;
• Finalise Manual Audiology referrals if required.

Private Hospitals
The HH Program has the capacity to upload birth registration data so that screening data can be matched to it.

9. Healthy Hearing Screener Training Standards

To maintain statewide consistency in the delivery of a ‘universal’ newborn hearing screening program, screeners are required to participate in an approved Healthy Hearing Screener Training program and be assessed competent by the local or Area HH Co-ordinator/Team Leader prior to undertaking newborn hearing screening.

The Healthy Hearing Screener Training comprises two major components:
1. Developing theoretical knowledge and understanding of the rationale for universal newborn hearing screening and associated policies and procedures.
2. Developing practical skills in performing hearing screens.

Competencies are assessed at the completion of formal training, and again after the participants have undertaken a total of 5 screens independently.

The training program is conducted over 1.5 to 2 consecutive days in order to maximise retention and application of knowledge in the practical situation. A sample training program is provided in Appendix 8.

Local HH facility co-ordinators are required to notify the HH Area Co-ordinator of any need for training and/or to advise of any proposed training programs. This is necessary to:
• Ensure that the local co-ordinator has access to current training programs and resources.
• Facilitate/coordinate training across sites.
• Provide any assistance or support required.

9.1 Objectives

By completion of the Screener Training program, participants are expected to be able to undertake the following at a satisfactory standard:
• Explain the benefits and process of newborn hearing screening to parents and professional colleagues.
• Perform newborn hearing screens, including appropriate baby selection and troubleshooting.
• Complete the necessary documentation, including the completion of the Consent Form, recording the appropriate information on the S&R Form, documentation in the PHR Book and in clinical pathways/charts according to local protocols.

9.2 Competencies

Screener competencies have been compiled with reference to the Australian Nursing and Midwifery Council documents ‘National Competency Standards for Registered Nurses, Enrolled Nurses and Midwives’.

Clinical competence is performance based and related to demands of the practice situation. Assessment of practice is considered a valid model of assessment of core competencies, skills and knowledge.

Specific competencies that must be demonstrated at the completion of training, and on an annual basis, are detailed in Appendix 8. These comprise both an assessment of practical hearing screening skills and completion of the online hearing screening knowledge assessment module/s. Once both components have been completed to a satisfactory standard, the Certificate of Competence generated by the online module link will be signed off by the Healthy Hearing Team Leader to certify that the screener is competent to perform Healthy Hearing screens.
**9.3 Training Format & Competency Assessment**

Guidelines for conducting training activities and assessing competencies are available in Appendix 8.

Competencies must be reassessed annually unless there is a break of 6 months or more in practice. In the latter situation, the screener should have their competencies reassessed prior to recommencing screening.

Screeners moving between facilities must show proof of recent theory & on-line competencies and be assessed by the local site co-ordinator to evaluate script and screening practice before being allowed to screen independently.
## Appendix 1 – Glossary of Terms and List of Abbreviations

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AABR 1</td>
<td>The first hearing screen performed where a Refer or Pass result is obtained for both ears.</td>
</tr>
<tr>
<td>AABR 2</td>
<td>The second hearing screen performed following a Refer outcome in one or both ears on the first (AABR1) screen, where a Refer or Pass result is obtained again for both ears.</td>
</tr>
<tr>
<td>Early Targeted Surveillance</td>
<td>Refers to babies who have passed their newborn hearing screening in both ears, but have been identified with the risk factors of Craniofacial Anomalies or Syndrome Associated with Hearing Loss. They are referred for diagnostic audiology assessment, despite the pass result, and are offered an appointment within 6 weeks post screen.</td>
</tr>
<tr>
<td>Corrected age</td>
<td>Equals the chronological age in weeks minus time born before 40 weeks.</td>
</tr>
<tr>
<td>Healthy Hearing Screening</td>
<td>• A process undertaken using the AccuScreen device using Automated Auditory Brainstem Response (AABR) technology. Auditory nerve responses are automatically measured and interpreted as a Pass ✓ or Refer ✗ response.</td>
</tr>
<tr>
<td></td>
<td>• Will only detect a hearing loss sufficient to interfere with speech &amp; language development, not whether hearing thresholds are within normal limits.</td>
</tr>
<tr>
<td></td>
<td>• Is not diagnostic, just identifies individuals who require further assessment. Only diagnostic tests (audiological &amp; medical) can confirm the presence of a hearing loss.</td>
</tr>
<tr>
<td></td>
<td>• Only indicates whether hearing is adequate for the development of normal speech and language skills at the time of screening.</td>
</tr>
<tr>
<td>Incomplete result</td>
<td>Refers to an incomplete screen attempt. This 📜 prompt will occur when the noise level in the room is too high, or the baby is not settled enough to screen, or if the impedance prevents the screen starting or continuing.</td>
</tr>
<tr>
<td>Medically suitable</td>
<td>Babies who are at least 34 weeks gestational age &amp; preferably less than 1 month corrected age &amp; who have no significant craniofacial abnormalities; are in an open crib; off ventilators; &amp; are not receiving central nervous system stimulants (e.g. caffeine), ototoxic medications or phototherapy for hyperbilirubinaemia. Babies can be screened up to 3 months corrected age for preterm and sick babies.</td>
</tr>
<tr>
<td>Nurse screener</td>
<td>• Midwife, Registered Nurse or Enrolled Nurse who has completed an approved education program and achieved competencies in performing universal newborn hearing screening using the AccuScreen.</td>
</tr>
<tr>
<td>Pass result</td>
<td>• ✓ PASS requires a minimum of 800 matched template responses from the baby’s brain against the algorithm embedded in the AccuScreen software program.</td>
</tr>
<tr>
<td></td>
<td>• ✓ PASS indicates that an auditory brainstem response was repeatedly detected as being present to a 35 decibel Chirp based stimuli.</td>
</tr>
<tr>
<td></td>
<td>• Only indicates that hearing is adequate at the time of screening for the development of normal speech and language.</td>
</tr>
<tr>
<td></td>
<td>• It does not indicate that the baby can hear at normal levels or guarantee that the baby’s hearing will not change over time.</td>
</tr>
<tr>
<td></td>
<td>• A slight hearing loss could still be present and hearing can change over time so ongoing parental monitoring using the Hearing and Speech Checklist is essential.</td>
</tr>
<tr>
<td>Refer result</td>
<td>• ✗ REFER occurs when there has not been 800 sufficient matching responses to the template algorithm analysed within the AccuScreen device, after a minimum test time of 4 minutes.</td>
</tr>
<tr>
<td></td>
<td>• Only indicates that further assessment (second screen or diagnostic Audiology) is required.</td>
</tr>
<tr>
<td></td>
<td>• Does not indicate that a hearing loss is present, though it is important to acknowledge that this is one possibility.</td>
</tr>
<tr>
<td>Screen</td>
<td>A test procedure applied to a population to identify those who require diagnostic assessment. Screening results themselves are not diagnostic; they only indicate the possibility of a condition being present or absent. Screening allows the identification of individuals who would not otherwise be suspected of having a problem.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Screening device / AccuScreen</td>
<td>The device approved to perform newborn hearing screening for the Healthy Hearing Program, i.e. the AccuScreen. Stimulus used for the AABR AccuScreen is set at 35 decibels and uses a Chirp stimulus, at a rate of 78 – 82 chirps per second.</td>
</tr>
<tr>
<td>Targeted Surveillance</td>
<td>Refers to babies who have passed their newborn hearing screening in both ears, but have been identified with risk factors for delayed onset or progressive hearing loss listed on the Healthy Hearing S&amp;R Form (with the exception of Craniofacial Anomalies or Syndrome Associated with Hearing Loss). These babies require referral to Audiology, for surveillance assessment between 9 and 12 months corrected age.</td>
</tr>
</tbody>
</table>

**List of Abbreviations**

- **AABR** Automated Auditory Brainstem Response
- **ABR** Auditory Brainstem Response
- **CP** Clinical Pathway
- **ETS** Early Targeted Surveillance
- **FSF** Family Support Facilitator
- **HH** Healthy Hearing
- **HHP** Healthy Hearing Program
- **HL** Hearing Loss
- **PCHL** Permanent Childhood Hearing Loss
- **PHL** Permanent Hearing Loss
- **PHR** Personal Health Record Book
- **QHLFSS** Queensland Hearing Loss Family Support Service
- **S&R Form** Screening and Referral Form
Appendix 2 – Healthy Hearing Forms

Please see the below table for a summary of the forms used by the Healthy Hearing Program. Copies of the forms can be located on the pages following after the table.

Translated versions of the Consent Form in various languages can be found on the Healthy Hearing Website for printing at: https://www.childrens.health.qld.gov.au/chq/our-services/community-health-services/healthy-hearing-program/resources/

<table>
<thead>
<tr>
<th>Form Title</th>
<th>Target Group</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| Healthy Hearing Program Consent                              | Parent/s of all babies who give consent or decline the hearing screen       | Medico-legal document for recording:  
  • Parent/s understanding of the hearing screen & any risks associated with having/not having screen  
  • possible use of the results including recording in the data base, research & notification to other health professionals  
  • parent/s consent/decline of hearing screen                                                                 |
| Healthy Hearing Program Newborn Hearing Screening & Referral | To be completed for all babies regardless of whether they commence/complete the hearing screen process | Medico-legal document used to:  
  • record demographic & medical data including presence of high risk indicators for hearing loss  
  • record results & follow-up actions of screen for filing in babies’ clinical charts  
  • refer baby to Audiology & Family Support Service  
  • provide a template for data entry into AccuScreen  
  • any additional information re screening history                                                                 |
| Consent for Release of Healthy Hearing Information in a Surrogacy Situation | To be completed by the biological mother prior to parentage order; or by the intended parent once the parentage order has been made. | Medico-legal document used to clarify the legal rights regarding who can provide consent for screening, and who is considered the Next of Kin. This form needs to be signed when the baby requires referral to audiology (Direct, ETS or TS referral). It should be forwarded with the original Consent Form and S&R Form to the Audiology Service and to the QHLFSS. |
A. The hearing screen

I understand that all newborn babies should have a hearing screen to check if the baby might have a hearing problem.

B. Are there any risks?

I understand that there are no known risks of injury to a baby in this procedure, but:

- There is a small chance that the hearing screen may show that there is no hearing loss where there might in fact be a hearing loss.
- A child could still develop a hearing loss later in life. It is therefore important for parents to continue to monitor their baby’s hearing.

I understand that if I do not give consent for my child to have the hearing screen, a hearing loss might not be detected until a later stage. Later detection may mean that my child could experience delayed language development.

C. Parent consent or decline

I acknowledge that:

- I have read or have had explained to me the brochure - “Your baby’s free hearing screen”, and ___________________________ has explained to me Queensland’s Healthy Hearing Program.
- I was able to ask questions and raise concerns about the procedure and its risks. My questions and concerns have been discussed and answered to my satisfaction.
- I understand that where it is indicated that my child requires further testing, health professionals such as my GP, Child Health Nurse, Paediatrician, Audiologist, Family Support Facilitator and staff of the Healthy Hearing Program may be notified of the results and I may be contacted by staff associated with the Healthy Hearing Program.

I also understand that:

- The results of the screen will be recorded on a database which assists with follow-up of babies who require further testing or treatment. The database also allows for monitoring of the Healthy Hearing Program.
- Information from the database may be used for research purposes but names will not be used in any reports or published information.
- If clinical assessment indicates that my child should not be screened then they will be referred to Audiology for diagnostic assessment.

On the basis of the above statements:

Screening

☐ I consent to my baby having the hearing screen.
☐ I DO NOT consent to my baby having the hearing screen.

Clinical exclusion to screening

☐ I consent to my baby being referred to Audiology, without screening.
☐ I DO NOT consent to my baby being referred to Audiology, without screening.

Parent name (please print): ___________________________ Signature: ___________________________ Date: ___________________________

D. Hospital staff statement

- I have explained to the parent the procedure and the risks.
- I have given the parent an opportunity to ask questions about any of the above matters and raise any other concerns which I have answered as fully as possible. I am of the opinion that the parent understood the above information.

Staff member name (please print): ___________________________ Signature: ___________________________ Date: ___________________________

Interpreter / cultural needs

Is an Interpreter Service required? ☐ Yes ☐ No

I have given a translation in ___________________________ of the consent form and any verbal and written information given to the parent by the hospital staff member.

If yes, is a qualified Interpreter present? ☐ Yes ☐ No

Is a Cultural Support Person present? ☐ Yes ☐ No

Interpreter name (please print): ___________________________ Signature: ___________________________ Date: ___________________________
Healthy Hearing Program
Newborn Hearing Screening and Referral

Facility: 

Alternative contact and relationship information: (FOB: Father of baby, MOB: Mother of baby, PGM: Paternal grandmother, PGM: Paternal grandfather, AOB of baby etc., Friend)
Name (1): , Phone number: 
Name (2): , Phone number: 
Medical contact: Name: , Address: 

Baby’s details

UR Number: (enter UR number for hospital where screen is performed)
Hospital of birth: (enter approved HHP code for facility site)
Gestational age at birth: weeks (enter number in whole weeks only)
Location of Screen: ☐ Maternity ☐ ICN ☐ SCN ☐ Birth Suite / Centre ☐ OPD ☐ Home ☐ Community ☐ Paed Ward
Indigenous Status: ☐ 1. Aboriginal ☐ 2. Torres Strait Islander ☐ 3. Aboriginal and Torres Strait Islander ☐ 4. Not Aboriginal or Torres Strait Islander ☐ 5. Not stated

High risk indicators (If “yes”, Audiology surveillance is required; copy of completed form to be sent to Audiology)
☐ Yes ☐ No Family history of permanent childhood hearing loss (mother / father / siblings of baby only) excluding grommets / ear infection / trauma Details: 
☐ Yes ☐ No * Syndromes associated with hearing loss (e.g. Down’s, Pierre Robin) Details: 
☐ Yes ☐ No Prolonged ventilation >120 hours (IPPV / CPAP / HHNC) Number of hours: 
☐ Yes ☐ No Bacterial meningitis Details: 
☐ Yes ☐ No Severe asphyxia at birth (convulsions / HE / PPHN) Details: 
☐ Yes ☐ No * Craniofacial anomalies as, cleft palate (exclude cleft lip and skin tags) Details: 
☐ Yes ☐ No Hyperbilirubinemia levels >340μmol/L (Term) or >150μmol/L (Preterm) Max SBR level: μmol/L 
☐ Yes ☐ No Parinatal Infection of the baby (confirmed / suspected) Toxoplasnosis ☐ Rubella ☐ CMV ☐ Herpes ☐ Syphilis 
☐ Yes ☐ No Professional / other major medical concerns / Chemotherapy Details: 

AABR 1 screening results

Date: Time: 
Right Ear: ☐ Pass ☐ Refer Left Ear: ☐ Pass ☐ Refer 
Milestones, monitoring, otois media discussed 
Name: Designation: Signature: Comments: 

AABR 2 screening results

Date: Time: 
Right Ear: ☐ Pass ☐ Refer Left Ear: ☐ Pass ☐ Refer 
Milestones, monitoring, otois media discussed 
Name: Designation: Signature: Comments: 

Follow up actions
☐ OPD Screening app’t on at 
☐ Result reversal (Flip Flop): AABR3 required → see page 2
Information letter to: ☐ Pass with risk factors ☐ Parental decline FTA / LTF Date letter sent: 

Referral process
☐ Refer to Audiology at:
Date of referral sent: 
for: ☐ Audiology ABR assessment ☐ Brochure provided to family for ABR
OR
for: ☐ * Early targeted surveillance by 6 weeks ☐ Targeted surveillance by first birthday ☐ Brochure provided to family for Early I/S or T/Surv
☐ Refer to Family Support Facilitator (QHFLSS)
Date referral sent to QHFLSS: (Direct Refers only) Interpreter required: ☐ Yes ☐ No Language: 

Screen not completed
☐ Baby not screened at this facility ☐ Screen incomplete at this facility ☐ Declined to screen ☐ Baby died after birth Date: 
Transferred to: ☐ Failed to attend (FTA) / Lost to follow up (LTF) 
☐ Audiology → Medical exclusion Microtia / Atresia of any ear 
☐ Audiology → Clinician overrides / Too ill to screen 

Page 1 of 2
Healthy Hearing Program  
Newborn Hearing  
Screening and Referral

### AABR 3 screening results

If required after result reversal (flip flop)

<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
</tr>
</thead>
</table>

Right Ear: [ ] Pass  [ ] Refer  
Left Ear: [ ] Pass  [ ] Refer

[ ] Milestones, monitoring, otitis media discussed

Name:  
Designation:  
Signature:  
Comments:  

### Aborted screen documentation

<table>
<thead>
<tr>
<th>Aborted by Screener:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance</td>
</tr>
<tr>
<td>Myogenic/EEG</td>
</tr>
<tr>
<td>Background noise</td>
</tr>
<tr>
<td>Lack of ABR progress</td>
</tr>
</tbody>
</table>

Date:  
Name:  

<table>
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</tbody>
</table>

Date:  
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<tr>
<td>Background noise</td>
</tr>
<tr>
<td>Lack of ABR progress</td>
</tr>
</tbody>
</table>

Date:  
Name:  

### Additional notes  
(May be used, as required, to record additional data and free text notes)

**Date / Time**  
Add signature, printed name, staff category, date and time to all entries

**MAKE ALL NOTES CONCISE AND RELEVANT**  
Leave no gaps between entries
Consent for Release of Healthy Hearing Information in a Surrogacy Situation

All newborn babies born in public and private facilities in Queensland are registered on the hospital’s information system, usually using the format birth mother’s surname and “baby of …” (first name of mother). The Healthy Hearing Program receives a summary of this birth data. Hearing screen records are then matched with the birth registration records and stored on a database. This assists the program to follow-up any babies who missed having a screen or who require further testing or treatment.

If the result of the hearing screen is a ‘Pass’ result for both ears and there are no risk factors for future hearing loss, no further action will be taken with this record.

If a baby has a ‘Refer’ result on their second hearing screen or if they have any risk factors that could lead to the development of a hearing loss in the future, they will be referred to an audiology service for further investigation and to the Family Support Service. If a hearing loss is detected, the audiology service will refer the baby on to other services. These services will be able to access and update the baby’s record on the Healthy Hearing database, QChild.

For a surrogate birth, it is important that staff of the Healthy Hearing Program know who they can contact if your baby does need follow up testing or treatment. Please tick one of the following options:

☐ Prior to Parentage Order:
  • The birth mother and/or birth mother’s spouse remain the legal guardians of the baby until a parentage order has been made.
  • Until a parentage order is made, all consent for screening, referrals and/or treatment must be provided by the birth mother and/or birth mother’s spouse and not the intended parents.
  • The baby will be identified as the baby of the birth mother until a parentage order is made.
  • The baby will be identified under the birth mother’s surname and “baby of … first name of mother” (or the first name identified by the birth mother).
  • The birth mother and/or birth mother’s spouse will be listed as the primary contact in case there is any need for follow up testing or treatment.
  • The contact details of the Intended Parents and/or Couple will be listed on the system as a secondary or alternative contact but they cannot provide consent for any screening, referrals and/or treatment until after a parentage order has been made.

  Name of Birth Mother: ____________________________  Signature: ____________________________  Date: ____________________________

  Name of Witness (Health Service employee): ____________________________  Signature: ____________________________  Date: ____________________________

☐ Once the Parentage Order is in place:
  • The baby will be identified under the name of the parent/s (previously known as the Intended Parents and/or Couple prior to the Parentage Order being made).
  • The parent/s will be listed as the primary contact.
  • The database will be changed to reflect the parentage update i.e. the birth mother’s contact details will be removed from the record and will only be accessible by QChild system administrators.
  • The original parentage order must be sighted by a Health Service employee.

☐ The original parentage order has been sighted.

☐ The Healthy Hearing Program Consent form has also been signed.

  Name of Parent: ____________________________  Signature: ____________________________  Date: ____________________________

  Name of Witness (Health Service employee): ____________________________  Signature: ____________________________  Date: ____________________________
### Possible AABR1 Outcomes (including follow-up action and documentation)

<table>
<thead>
<tr>
<th>AABR Pass/Pas</th>
<th>Result</th>
<th>Follow Up Actions</th>
<th>Documentation Requirements</th>
</tr>
</thead>
</table>
| AABR1 Pass/Pas - No High Risk Indicators | Pass in both ears | • No further formal assessment required.  
• Advise parent to monitor baby’s milestones against Speech & Hearing checklist on HH brochure. | • Complete the AABR1 Screening results section of the S&R form:  
○ Tick the Pass box for the Right and Left ears.  
○ Enter date, screener details, signature and comments if necessary.  
○ Complete the Follow up actions section of the Healthy Hearing S&R form:  
○ Tick Milestones, monitoring &/or otitis media discussed.  
○ Record the result in baby’s Personal Health Record Book.  
○ File the Consent form in the baby’s clinical chart.  
○ Complete clinical pathways document (if used) or record variance in mother’s and/or baby’s charts. |
| INTERPRETATION | Bilateral Pass |  |  |
| SCREEN STATUS | Screening Complete |  |  |

<table>
<thead>
<tr>
<th>AABR 1 Pass/Pas - with Risk Factors</th>
<th>Result</th>
<th>Follow Up Actions</th>
<th>Documentation Requirements</th>
</tr>
</thead>
</table>
| AABR1 Pass/Pas - High Risk Indicator/s Present | Pass in both ears | • Refer to Audiology for follow-up assessment within 6 weeks/before baby’s 1st birthday.  
• Encourage parents to monitor baby’s milestones against Speech & Hearing checklist on HH brochure & to contact Audiology for an earlier appointment if they are concerned.  
• Emphasize the importance of attending for diagnostic assessment, remind them that the screen is not diagnostic.  
• Encourage parent/s to contact Audiology if they have any questions prior to appointment.  
• Provide parent with “Your baby’s follow-up hearing test” brochure. | • Complete the AABR1 Screening results section of the S&R form:  
○ Tick the Pass box for the Right and Left ears.  
○ Enter date, screener details, signature and comments if necessary.  
○ Complete the Follow up Actions section of the Healthy Hearing S&R form:  
○ Tick Milestones, monitoring &/or otitis media discussed.  
○ Record location & date of referral to Audiology.  
○ Record appointment details if known.  
○ Record the result in the baby’s PHR Book & list the risk factors.  
○ Fax/forward a copy of completed S&R Form, including Notes page, to Audiology.  
○ File the S&R Form in the baby’s clinical chart.  
○ Complete clinical pathways document (if used) or record variance in mother’s and/or baby’s charts. |
| INTERPRETATION | Early Targeted Surveillance or Targeted Surveillance |  |  |
| SCREEN STATUS | Screening Complete - Pass with Surveillance |  |  |

<table>
<thead>
<tr>
<th>AABR1 Refer Result</th>
<th>Result</th>
<th>Follow Up Actions</th>
<th>Documentation Requirements</th>
</tr>
</thead>
</table>
| AABR1 Refer Result | Refer result one ear and pass in other ear | • AABR2 required:  
○ Rescreen as soon as possible, ideally leave a minimum of 12-24 hours between screens.  
○ If a baby is attending as an outpatient the AABR2 should be performed within 1-2 weeks.  
Complete screen by 1 month for term healthy babies, and 3 months corrected age for sick or preterm babies. | • Complete the AABR1 Screening results section of the S&R form:  
○ Tick the Pass/Refer box as appropriate for the Right and Left ears.  
○ Enter date, screener details, signature and comments if necessary.  
○ Record the result in baby’s Personal Health Record Book.  
○ File the Consent form in the baby’s clinical chart.  
○ File the S&R Form in the baby’s clinical chart.  
○ Complete clinical pathways document (if used) or record variance in mother’s and/or baby’s charts. |
| INTERPRETATION | Bilateral refer (Both ears) |  |  |
| SCREEN STATUS | AABR2 Required |  |  |

<table>
<thead>
<tr>
<th>AABR1 - Incomplete Result</th>
<th>Result</th>
<th>Follow Up Actions</th>
<th>Documentation Requirements</th>
</tr>
</thead>
</table>
| AABR1 - Incomplete Result | No result in one ear and a pass/refer for other ear | • Repeat AABR1 as soon as practical. A maximum of 2 repeats in the same screening episode will be allowed.  
Ensure conditions are suitable to restart.  
• Rescreen both ears.  
• If a baby is attending as an outpatient the AABR1 should be performed within 1-2 weeks.  
• Complete screen by 1 month for term healthy babies, and 3 months corrected age for sick or preterm babies. | • As a complete screen has not been obtained, the AABR1 screening results box should be left blank & outcome of screen recorded on Notes page of S&R Form.  
• The Screen Incomplete box should only be ticked if baby has been discharged from care.  
• File the Consent form in the baby’s clinical chart.  
• File the S&R Form in the baby’s clinical chart.  
• Complete clinical pathways document (if used) or record variance in mother’s and/or baby’s charts. |
| INTERPRETATION | Screen Incomplete |  |  |
| SCREEN STATUS | Repeat AABR1 |  |  |
**Possible AABR2 Outcomes (including follow-up action and documentation)**

### AABR2 Pass/Pass - No High Risk Indicators

#### RESULT
- Pass result in both ears - No High Risk Indicators

#### INTERPRETATION
- Bilateral Pass

#### SCREEN STATUS
- Screening Complete

#### Follow Up Actions
- No further formal assessment required.
- Advise parent to monitor baby’s milestones against Speech & Hearing checklist on HH brochure.
- Notify family if further assessment is required.

#### Documentation Requirements
- Complete the AABR2 Screening results section of the S&R Form:
  - Tick the Pass box for the Right and Left ears.
  - Enter date, screener details, signature and comments if necessary.
- Complete the Follow up Actions section of the Healthy Hearing S&R Form:
  - Tick Milestones, monitoring &/or otitis media discussed.
  - Record the result in baby’s Personal Health Record Book.
  - Review the result in baby’s clinical chart.
- Complete clinical pathways document (if used) or record variance in mother’s and / or baby’s charts.

### AABR2 Pass/Pass - with risk factors

#### RESULT
- Refer result one ear and pass in other ear

#### INTERPRETATION
- Early Targeted Surveillance or Targeted Surveillance

#### SCREEN STATUS
- Screening Complete - Pass with Surveillance

#### Follow Up Actions
- Refer to Audiology for follow up assessment within 6 weeks before baby’s 1st birthday.
- Encourage parents to monitor baby’s milestones against Speech & Hearing checklist on HH brochure & to contact Audiology for an earlier appointment if they are concerned.
- Emphasise importance of attending diagnostic assessment, remind them the screen is not diagnostic.
- Encourage parent/s to contact Audiology if they have any questions prior to appointment.
- Provide parent with ‘Your baby’s follow-up hearing test’ brochure.

#### Documentation Requirements
- Complete the AABR2 Screening results section of the S&R Form:
  - Tick the Pass box for the Right and Left ears.
  - Enter date, screener details, signature and comments if necessary.
- Complete the Follow up Actions section of the Healthy Hearing S&R Form:
  - Tick Milestones, monitoring &/or otitis media discussed.
  - Record location & date of referral to Audiology.
  - Tick Surveillance box.
  - Record appointment details if known.
  - Record the result in baby’s PMH Book & list the risk factors.
  - Fax/forward a copy of completed S&R Form, including Notes page, to Audiology.
  - File the S&R Form in the baby’s clinical chart.
  - Complete clinical pathway document (if used) or record notation in mother’s &/or baby’s charts.

### AABR2 Refer Result

#### RESULT
- Refer result both ears or Refer result one ear and pass in other ear

#### INTERPRETATION
- Bilateral refer (both ears)
- Unilateral refer (one ear)

#### SCREEN STATUS
- Immediate diagnostic audiology assessment

#### Follow Up Actions
- Provide the family with ‘Your baby’s audiology hearing test’ brochure
- Note audiology contact details in space provided on brochure
- Remind parents of the possible reasons for the Refer result, as listed on brochure
- Emphasise importance of attending diagnostic assessment
- Recommend as soon as possible, ideally leave a minimum of 12-24 hours between screens
- Encourage parent/s to contact Audiology/FSF if they have any questions prior to appointment

#### Documentation Requirements
- Complete the AABR2 Screening results section of the S&R Form:
  - Tick the Pass/Refer box as appropriate for the Right and Left ears.
  - Enter date, screener details, signature and comments if necessary.
- Complete the Follow up Actions section of the Healthy Hearing S&R Form:
  - Tick Milestones, monitoring &/or otitis media discussed.
  - Record location & date of referral to Audiology.
  - Tick Audiology Assessment box.
  - Record appointment details if known.
  - Record date of referral to Family Support Service.
  - Record the result in baby’s Personal Health Record Book.
  - Fax/forward a copy of completed S&R Form, including Notes page, to Audiology.
  - File the S&R Form in the baby’s clinical chart.
  - Complete clinical pathways document (if used) or record notation in mother’s &/or baby’s charts.

### AABR2 NA or NaN Result

#### RESULT
- No result in one ear and a pass/refer result one ear and pass in other ear

#### INTERPRETATION
- Screen Incomplete

#### SCREEN STATUS
- Repeat AABR2

#### Follow Up Actions
- Recheck AABR2 as soon as practical & rescreeen both ears. A maximum of 2 repeats in the same screening episode will be allowed. Ensure conditions are suitable to restart.
- If a baby is attending as an outpatient, the AABR2 should be performed within 1-2 weeks.
- Complete screen by 1 month for term healthy babies, and 3 months corrected age for sick or preterm babies.

#### Documentation Requirements
- Leave AABR2 screening results box blank & record screen outcome in Notes section of S&R Form.
- The screen Incomplete box should only be ticked if baby has been discharged from the screen.
- File the Consent form in the baby’s clinical chart.
- File the S&R Form in the baby’s clinical chart.
- Complete clinical pathways document (if used) or record notation in mother’s and / or baby’s charts.

### AABR2 NA or NaN/Flip Result

#### RESULT
- Result reversal - Refer result is obtained in an ear that gave a Pass result in previous screen, and vice versa.

#### INTERPRETATION
- Flip/Flip

#### SCREEN STATUS
- Perform 3rd screen

#### Follow Up Actions
- Advise parents that alternating results may reflect fluctuating status within the ear (e.g. fluid/debris) and not an equipment fault.
- Preferably leave 2-24 hours before rescreening.
- Complete screen by 1 month for term healthy babies, and 3 months corrected age for sick or preterm babies.

#### Documentation Requirements
- Complete the AABR2 Screening results section of the S&R Form:
  - Tick the Pass/Refer box as appropriate for the Right and Left ears.
  - Enter date, screener details, signature and comments if necessary.
  - Record the result in the baby’s Personal Health Record Book.
  - File the S&R Form in the baby’s clinical chart.
  - Complete clinical pathways document (if used) or record variance in mother’s and / or baby’s charts.
### Appendix 4 – Screener’s Scripts

The table below provides a summary of the various Hearing Screen scenarios and the key content areas to be covered for each scenario.

Following on from the table are the expanded screener scripts for use as required.

<table>
<thead>
<tr>
<th>Hearing Screen Scenario</th>
<th>Purpose/Key points to be included</th>
</tr>
</thead>
</table>
| Arranging an initial Healthy Hearing Screen | ▪ Explain program aims & offer screen  
▪ Describe procedure as per brochure  
  o How the screen is done  
  o Potential results  
  o Meaning of a Pass ✓ & a Refer ◎ result  
  o Potential follow up actions (AABR2; Audiology)  
▪ Key elements of script all contained in HH brochure  
▪ Use brochure as a prompt sheet  
▪ Provide parents with an opportunity to ask questions |
| Pass ✓ result on AABR1 | ▪ Remind parent/s:  
  o Pass ✓ only indicates baby can hear at a level required for speech & language development  
  o Pass is not for life → ear infections, trauma, etc.  
  o Need for them to monitor of baby’s milestones against Hearing & Speech checklist  
▪ Advise parents to seek Audiology referral if they are concerned about baby’s hearing in the future |
| Pass ✓ result on AABR1 with risk factor/s | ▪ Remind parent/s:  
  o Pass ✓ only indicates baby can hear at a level required for speech & language development  
  o Pass is not for life → ear infections, trauma, etc.  
  o Need for referral to Audiology for follow up assessment prior to 6 weeks for Early Targeted Surveillance or 12 months if Targeted surveillance, because of risk factor/s for delayed onset/progressive hearing loss  
  o Need for them to monitor of baby’s milestones against Hearing & Speech checklist  
▪ Advise parents to seek earlier referral to Audiology if they have any concerns about baby’s hearing prior to the scheduled Audiology appointment |
| Refer ◎ result on AABR1 | ▪ Remind parent/s that Refer ◎ result only indicates that a further screen is required  
▪ Explain the range of reasons for a Refer result, acknowledging a hearing loss as one possibility  
▪ Emphasise the importance of attending for the second screen to clarify the situation  
▪ Make arrangements with parent/s for AABR2 |
| Pass ✓ result on AABR2 | ▪ Remind parent/s:  
  o Pass ✓ only indicates baby can hear at a level required for speech & language development  
  o Pass is not for life → ear infections, trauma, etc.  
  o Advise parent/s of potential increased risk of otitis media (glue ear) due to Refer result on AABR1  
  o Need for parents to monitor of baby’s milestones against Hearing & Speech checklist  
▪ Advise parents to seek referral to Audiology if they have any concerns about baby’s hearing in the future |
<table>
<thead>
<tr>
<th><strong>Pass ✓ result on AABR2 with risk factor/s</strong></th>
<th><strong>Remind parent/s:</strong></th>
</tr>
</thead>
</table>
| Parent/s of baby with a *Pass* result for both ears on AABR2, with 1 or more risk factors (Early Targeted Surveillance or Targeted Surveillance). | o *Pass ✓* only indicates baby can hear at a level required for speech & language development  
 o *Pass* is not for life → ear infections, trauma, etc.  
 o Need for referral to Audiology for follow up assessment prior to 6 weeks for Early Targeted Surveillance, or 12 months if routine Targeted surveillance because of risk factor/s for delayed onset/progressive hearing loss  
 o Need for them to monitor of baby’s milestones against *Hearing & Speech checklist*  
 o Advise parents to seek earlier referral to Audiology if they have any concerns about baby’s hearing prior to the scheduled Audiology appointment. |

<table>
<thead>
<tr>
<th><strong>Refer ✗ result on AABR2</strong></th>
<th><strong>Remind parent/s:</strong></th>
</tr>
</thead>
</table>
| Parent/s of baby with a *Refer* result for one or both ears on AABR2 | o that a *Refer ✗* result only indicates that more detailed assessment by Audiology is required  
 o of possible reasons for a *Refer* result, acknowledging the possibility of a hearing loss as one reason but not the only reason  
 o Explain the referral process to Audiology  
 o Provide parents with a copy of the brochure *Your Baby’s Audiology Hearing Test*  
 o Check that parents are happy to be referred to the Family Support Service who will contact them within a week of referral by mail and phone  
 o Provide parents with Audiology contact details & encourage them to contact the Audiologist or FSF if they have questions/concerns prior to the appointment. |

<table>
<thead>
<tr>
<th><strong>Parent/s decline Healthy Hearing Screen</strong></th>
<th><strong>If a parent declines:</strong></th>
</tr>
</thead>
</table>
| Following standard introduction | o Ask if they have a specific reason for declining  
 o Assess if there is misunderstanding regarding risks, process etc. & clarify if required  
 o Reinforce implications for speech, language, education if a HL remains undetected  
 o Ask parent to sign Decline section of the Healthy Hearing Consent form  
 o Advise that the baby’s GP/paediatrician will be notified  
 o Offer to screen later should they change their mind  
 o Provide Healthy Hearing brochure & contact details. |

<table>
<thead>
<tr>
<th><strong>AABR3 required due to result reversal (Flip/flop)</strong></th>
<th><strong>Explain to parents that:</strong></th>
</tr>
</thead>
</table>
| Parent/s of baby with Refer result on opposite ears on AABR1 & 2 | o *2nd Refer ✓* result is required on the same ear for referral to Audiology  
 o if another *Refer* result is obtained in either ear then the baby will be referred to Audiology  
 o Remind parent/s that the *Refer* result still only indicates that further assessment is required  
 o Reassure parents that the result reversal does not indicate an equipment malfunction but can result from fluctuating responses in the ears due to changing fluid levels, debris in the ear from the birth process moving, positioning of the baby etc.  
 o Emphasise the importance of attending for the third screen to clarify the situation  
 o Make arrangements with parent/s for AABR3. |
Healthy Hearing Screener Scripts

Introduction / Explanation of Screening process to parent / carer
Hello, I am (insert name) from the Healthy Hearing team.
I would like to offer your baby a hearing screen.
Have you had an opportunity to read the brochure?
I will need to obtain your written consent in order to proceed. Do you have any questions?

Can I explain the screening process for you?
• We use a technique called an AABR / Automated Auditory Brainstem Response.
• Three small sticky gel pads will be gently placed on your baby’s head and cheek area.
• Earphones are placed over both ears, and a series of soft clicking noises are played through these earphones.
• The sticky pads or sensors will pick up your baby’s brain response to these sounds and send it to the machine for analysis.
• The machine will automatically indicate a PASS ✔ or a REFER ✗ result.
• It is a quick screen if your baby is in a quiet/settled state. It is not painful and most babies sleep through the screen.
• Do you have any questions? Can I go over any details again for you?

The results of the screen
• If your baby is settled & the screen is completed, we can tell you the result at the end of the screen.
• If your baby does not settle we will attempt the screen later in the day.
• As soon as the screen is complete and the machine gives an automatic result we will be able to tell you the result.

What does PASS/REFER mean?
• A PASS ✔ result indicates that your baby hears at levels required for normal speech & language development at the time of the screen. Your baby can hear you speak.
• A REFER ✗ result means we will need to repeat the hearing screen again.
• Sometimes there might be a ☹️ symbol displayed. The AccuScreen will automatically stop screening and display this symbol if the conditions are not ideal to continue the screen. This may involve settling the baby, or reapplying skin sensor pads, or ensuring the room is quiet. The Nurse screener will need to restart the hearing screen.

Obtaining consent
I would like to explain the consent form to you.
Have you had an opportunity to look over the brochure describing the screening process?
Do you have any questions about the brochure information?

Brochure Information:
Section A:
• This section recommends all babies should have their hearing checked.

Section B:
• This part outlines there are no known risks of injury to your baby during the screen.
• There is a small chance of a false result from this screening process (1 in a million).
• It is important for you to continue to monitor your baby’s hearing even after the screen today.
• This outlines that a delay in detecting a hearing loss could delay your baby’s language development.
Section C:
• This is where I write my name (screening staff member) after I have explained the screening process for you.
• I encourage you to raise any questions or concerns at this stage.
• Should your baby require further hearing tests, your consent on this form will allow us to share the screening information with other health professionals.
• The screening results will be stored on our database.
• All information is confidential and no names are used when reports are generated for program evaluation and research purposes.
• In the situation where your baby can not be screened for a clinical reason, a referral to Audiology will be arranged instead, this will bypass the screening procedure.
• This is where you need to tick the box “I do” or “I do not consent”.
• Please sign and date in this section here.

Section D:
• This is where I need to sign and date the form after I have explained the screening process to you.
• This section is used if an interpreter is required.
• Are you happy to continue with the screen today?
• Are there any other questions I can help you with?

PASS outcome Well baby- no ‘risk factors’
• A PASS result ✓ today indicates that your baby hears at levels required for normal speech & language development at the time of the screen- your baby can hear you speak.
• We will not routinely assess your babies hearing again.
• Hearing constantly changes throughout our lives and it is important that you monitor these changes. This is not a pass for life.
• We recommend that you refer to the Hearing & Speech checklist in ‘Your baby’s free hearing screen’ brochure. This gives details of the expected responses of your baby up to 18 months of age.
• If you have any concerns regarding your baby’s hearing, please contact your GP for a referral to Audiology.
• The Audiology Department located at the (insert local service name) can assess a child’s hearing at any age using a variety of age appropriate techniques.
• Do you have any questions? Can I go over any details again for you?

PASS result from AABR screening - Babies with ‘Risk Factors’
• A PASS result ✓ today indicates that your baby hears at levels required for normal speech & language development at the time of the screen- your baby can hear you speak.
• Hearing constantly changes throughout our lives and it is important that you monitor these changes. This is not a pass for life.
• We recommend that you refer to the Hearing & Speech checklist in ‘Your baby’s free hearing screen’ brochure. This gives details of the expected responses of your baby up to 18 months of age.
• Your responses to the “at risk” questions for progressive hearing loss highlight the need for us to continue to monitor your baby’s hearing closely.

**Script for babies requiring Early Targeted Surveillance by 6 weeks post-screening, i.e. Craniofacial Anomalies and Syndromes Associated with Hearing Loss:**
• You will be offered an appointment for your baby within 6 weeks to attend the Audiology Department at the (insert Hospital name) for further assessment.
• This appointment will be posted out to you.
• However, if you become concerned regarding your baby’s hearing before this appointment, please contact the Audiology department and discuss this matter further.
• Do you have any questions? Can I go over any details again for you?
**Script for babies requiring **Targeted Surveillance testing by **12 months** of age:**

- You will be offered an appointment around your baby’s 1st birthday to attend the Audiology Department at the (insert Hospital name) for further assessment.
- This appointment will be posted out to you.
- However, if you become concerned regarding your baby’s hearing they will accept a referral from your GP at any stage.
- Do you have any questions? Can I go over any details again for you?

**A REFER result on AABR1**

- A REFER X result today indicates that your baby needs another screen.
- There are several reasons why your baby requires a further screen:
  1. The screen was attempted when the baby was too young (Protocol recommends 4 - 6 hours or older).
  2. Baby was unsettled during the screen.
  3. Excessive background noise was present during the screen i.e. the screening conditions or environment were not ideal.
  4. Baby may have fluid or a temporary blockage in their ear.
  5. Temporary blockage of the external ear canal due to:
     - position of baby’s head.
     - pressure on the ear canal.
     - residual birth debris in the ear canal.
     - residual vernix in the ear canal.
  6. Possibility of some degree of hearing loss.
  7. Do you have any questions? Can I go over any details again for you?
- We will need to repeat the screen.
- This may be in hospital or we will arrange for you to return for another screen as an outpatient.
- The same technique will be used to screen your baby’s hearing.
- The nurse screener will be able to explain the results following the screen.
- This repeat screen will be undertaken either in the Hospital prior to discharge or in OPD.
- If you are unable to attend the OPD appointment please make contact and we will be happy to arrange another appointment for you.
- Do you have any questions? Can I go over any details again for you?

**PASS following AABR2 screen – include otitis media information**

- Refer to appropriate “PASS” script above i.e. Pass with / without risk factors
- Include the otitis media evidence from Karen Doyle et al 2004 paper: There is some evidence that babies who do not pass their first hearing screen at 48 hours of life, but go on to pass their second screen, have a higher incidence of an otitis media before their first birthday (twice as likely to develop).
- We recommend that you are very vigilant in monitoring your baby’s speech and language milestones and seek the review of your family GP when concerns arise.

**REFER AABR2- Diagnostic appointment to be arranged at the appointed Audiology Service**

- A REFER X result has been obtained on your baby’s second screen.
- Repeat the reasons for a refer outcome from the Refer on AABR1 Script i.e. blockage of external or internal ear, possibility of a hearing loss etc.
- I will arrange an appointment for a more detailed (diagnostic) test using a similar technique with earphones and sticky pads with (insert Audiology Service name here)
- This is performed by an Audiologist who is a specialist in the testing of hearing.
- With your referral to Audiology, we will link you with the QLD Hearing Loss Family Support Service. This service has offices in Brisbane and Townsville and provides early support, advocacy and information to families whose children are diagnosed with a permanent hearing loss. If your baby is found to have a permanent hearing loss, a Family Support Facilitator will make contact with you, and will be available to work with you and your family.
- You will need to attend (insert Audiology service name). Please check your appointment letter for details and contact numbers.
• I will return with a location map to help you find the Audiology department, and parking stations in the area.
• It is necessary for your baby to sleep during the audiology testing. They recommend that you feed & settle your baby once you arrive at the Audiology appointment. It may take up to 2 hours and will give them more information about your baby's hearing. They will discuss the results with you following the assessment.
• We suggest you have another adult with you for the Audiology appointment to assist with the baby, the testing equipment and information gathering at the appointment.
• It is important that you contact Audiology if you are unable to attend your appointment as soon as possible.
• You can ring and speak to an Audiologist at any time if you require any further information regarding the assessment on (provide contact phone number). They are very keen to answer your questions.
• Do you have any questions? Can I explain the process again for you?

Decline from a Parent / Carer
When a parent declines the HHP screen we are required to: record their decision on the HHP consent form; document decline in the baby's medical record; record the decline on the S&R Form; and advise them of the proactive language milestone monitoring required by them.
• I respect your decision to decline the HHP screen.
• May I ask why you are declining? Can I explain any part of the screening process again for you?
• I will make a note of your decline in your baby’s medical record.
• Would you please indicate your decline on this form (HHP consent form/ section C) in this section here….
• Should you wish to change your mind at a later date, it is ideal to complete the screen within 1 month of birth, however in some circumstances we can extend this time period to 3 months of age. We cannot offer a screen after that time.
• The contact phone number to arrange a screen is …….. I will write it here on the brochure.
• Can I show you this section on the brochure (point out milestones) that lists the normal language milestones your baby should be achieving up to 18 months of age?
• We will be in contact with your family GP to request continued monitoring of your baby's language milestones in partnership with you.
Appendix 5 – Syndromes Associated with Hearing Loss

The table below provides a list of syndromes and conditions that are associated with congenital and progressive hearing loss.

Please note: SNHL = Sensorineural Hearing Loss; SN = Sensorineural; HL = Hearing Loss

<table>
<thead>
<tr>
<th>Syndrome / Condition</th>
<th>Description / Features</th>
<th>Types of Hearing Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achondroplasia</td>
<td>Dwarfism, skeletal ossification disorder</td>
<td>Conductive or SNHL</td>
</tr>
<tr>
<td>Albers-Schonberg</td>
<td>Brittle, thickened, chalky bones</td>
<td>Conductive or SNHL</td>
</tr>
<tr>
<td>Disease of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osteoporosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albinism with Blue Irides</td>
<td>Pigmentation disorder eyes, skin, hair</td>
<td>SNHL</td>
</tr>
<tr>
<td>Alport Syndrome</td>
<td>Nephritis and cataracts</td>
<td>Progressive SNHL</td>
</tr>
<tr>
<td>Apert Syndrome</td>
<td>Craniosynostosis, midface anomalies, middle ear involvement</td>
<td>Conductive HL</td>
</tr>
<tr>
<td><strong>Aplasias</strong> (errors during embryonic development)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michel aplasia</td>
<td>Complete absence of inner ear &amp; auditory nerve</td>
<td>SNHL</td>
</tr>
<tr>
<td>Mondini aplasia</td>
<td>Abnormal development of the structure (turns) of the cochlear</td>
<td></td>
</tr>
<tr>
<td>Scheibe aplasia</td>
<td>Abnormal formation of the cochlear membrane</td>
<td></td>
</tr>
<tr>
<td>Asphyxia at birth / neonatal period</td>
<td>Resuscitation required / poor APGARs, seizures, neurological involvement</td>
<td>SNHL, including auditory neuropathy</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacterial Meningitis</td>
<td>Auditory involvement, can have sudden permanent hearing loss</td>
<td>SNHL, central effects</td>
</tr>
<tr>
<td>Bjornstad Syndrome</td>
<td>Dry, brittle, flat, twisted hair</td>
<td>SNHL</td>
</tr>
<tr>
<td>Branchio-Oto-Renal syndrome (BOR)</td>
<td>Renal anomalies, auricular pits, pinnae malformations</td>
<td>Conductive, SN or mixed HL</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carraro Syndrome</td>
<td>Absence of the Tibia bone</td>
<td>SNHL</td>
</tr>
<tr>
<td>Camurati-Engelmann Disease</td>
<td>Skeletal - enlarged diaphysis of the long bones</td>
<td>Conductive, SN or mixed HL</td>
</tr>
<tr>
<td>Chemotherapy medications (mother and baby)</td>
<td>Cisplatin, Carboplatin - inner ear hair cells affected</td>
<td>SNHL</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>Hypoxic episode during development or birth asphyxia</td>
<td>SNHL</td>
</tr>
<tr>
<td><strong>Craniofacial abnormalities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atresia of the ear canal</td>
<td>Complete/partial closure of the ear canal</td>
<td>Conductive, SN or Mixed HL</td>
</tr>
<tr>
<td>Absence or malformed</td>
<td>Microtia, atresia, stenosis, malformation of the pinna</td>
<td></td>
</tr>
<tr>
<td>pinna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleft Palate</td>
<td>Malformation of the hard palate (Exclude cleft lip if only feature present)</td>
<td>Conductive HL</td>
</tr>
<tr>
<td><strong>CHARGE Syndrome</strong></td>
<td>Abnormalities: Coloboma (eyes), Heart, Atresia (nares), Renal, Genital, Ear</td>
<td>Conductive, SN or mixed HL</td>
</tr>
<tr>
<td><strong>Cleidocranial Dysostosis</strong></td>
<td>Retarded ossification, narrowed auditory canal</td>
<td>Conductive &amp; SNHL</td>
</tr>
<tr>
<td><strong>Cockayne Syndrome</strong></td>
<td>Growth failure, neurologic delay, retinal atrophy</td>
<td>SNHL</td>
</tr>
<tr>
<td>Letter</td>
<td>Syndrome / Condition</td>
<td>Description / Symptoms</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>C</td>
<td>Cornelia de Lange Syndrome</td>
<td>SGA, limb malformations, cardiac defects, cleft palate</td>
</tr>
<tr>
<td></td>
<td>Crouzon Syndrome</td>
<td>Craniosynostosis, midface anomalies, outer &amp; middle ear defects</td>
</tr>
<tr>
<td>D</td>
<td>Dwarfism</td>
<td>Skeletal anomalies, shortness, short fingers</td>
</tr>
<tr>
<td></td>
<td>Down Syndrome</td>
<td>Middle ear anomalies - ossicles, otitis media infections</td>
</tr>
<tr>
<td>E</td>
<td>Encephalitis</td>
<td>Infection, auditory involvement</td>
</tr>
<tr>
<td></td>
<td>Engelmann Syndrome</td>
<td>Bone dysplasia, increased skeletal density affecting auditory function</td>
</tr>
<tr>
<td>F</td>
<td>Fanconi Anaemia Syndrome</td>
<td>Impaired renal transport, growth delay</td>
</tr>
<tr>
<td></td>
<td>Family History of hearing loss</td>
<td>Permanent hearing loss evident in early infancy &lt; 6 years (see Qld Health - S&amp;R list)</td>
</tr>
<tr>
<td></td>
<td>Fetal Alcohol Syndrome</td>
<td>LBW, skeletal anomalies, cleft palate, pinnae anomalies</td>
</tr>
<tr>
<td></td>
<td>Fraser Syndrome</td>
<td>Adherent eyelids, external ear malformations, syndactyly</td>
</tr>
<tr>
<td></td>
<td>Friedreich Ataxia</td>
<td>Progressive ataxia, cataracts</td>
</tr>
<tr>
<td>G</td>
<td>Goldenhar Syndrome</td>
<td>Eye, ear and mouth anomalies</td>
</tr>
<tr>
<td>H</td>
<td>Hemifacial Microsomia</td>
<td>Abnormal development on one side of the face, atresia/ stenosis canal</td>
</tr>
<tr>
<td></td>
<td>Hermann Syndrome</td>
<td>Late onset of disease. Epilepsy, speech, ataxia, renal disease</td>
</tr>
<tr>
<td></td>
<td>Hyperbilirubinaemia</td>
<td>Auditory nerve function affected due to excessive bilirubin</td>
</tr>
<tr>
<td></td>
<td>Hypoxic Ischaemic Encephalopathy (HIE)</td>
<td>Severe asphyxia with neurological sequelae, hypotonic limbs, significant morbidity</td>
</tr>
<tr>
<td></td>
<td>Hydrocephalus</td>
<td>IVH Grade 3 &amp; 4, internal cranial anomalies, 8th Cranial Nerve involvement</td>
</tr>
<tr>
<td></td>
<td>Hunter and Hurler Syndrome</td>
<td>Progressive manifestation of coarse facial features</td>
</tr>
<tr>
<td>I</td>
<td>Infections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cytomegalovirus</td>
<td>Herpes virus 5, microcephaly, hepatosplenomegaly, jaundice, IUGR</td>
</tr>
<tr>
<td></td>
<td>- Herpes</td>
<td>Congenital neonatal herpes infection HSV-1 &amp; 2 - High mortality</td>
</tr>
<tr>
<td></td>
<td>- Rubella</td>
<td>LBW, purpura, jaundice, Organ of Corti degeneration</td>
</tr>
<tr>
<td></td>
<td>- Toxoplasmosis</td>
<td>Parasitic infection, chorioretinitis, cerebral calcification, convulsions</td>
</tr>
<tr>
<td></td>
<td>- Syphilis</td>
<td>Nasal discharge, rash, anaemia, jaundice, osteochondritis</td>
</tr>
<tr>
<td></td>
<td>Intraventricular Haemorrhage - Grades 3, 4 and above (IVH)</td>
<td>Bleeding within the brain structures causing adverse neurological complications</td>
</tr>
<tr>
<td>J</td>
<td>Jervell and Lange-Nielsen Syndrome</td>
<td>Cardiovascular disorder, fainting, sudden death a feature, auditory involvement</td>
</tr>
<tr>
<td>K</td>
<td>Keratopachyderma with Digital Constrictions (aka Vohwinkel-Nockemann Syndrome)</td>
<td>Hyperkeratosis of palms, soles, knees, elbows, fingers and toes.</td>
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</tr>
<tr>
<td></td>
<td>Klippel-Feil Syndrome</td>
<td>Craniofacial and skeletal disorder, short neck, cleft, poorly developed inner ear structures</td>
</tr>
<tr>
<td>L</td>
<td>Laurence-Moon-Biedl-Bardet Syndromes</td>
<td>Retinitis pigmentosa, polydactyly</td>
</tr>
<tr>
<td></td>
<td>LEOPAR D Syndrome (aka Multiple Lentigines Syndrome)</td>
<td>Pigment disorder, café au lait spots, cardiac, ocular, genital, growth delay</td>
</tr>
<tr>
<td></td>
<td>Long QT Syndrome (LQTS)</td>
<td>Cardiac condition, sudden death</td>
</tr>
<tr>
<td>M</td>
<td>Marshall Syndrome</td>
<td>Short stature, skeletal defects, cataracts</td>
</tr>
<tr>
<td></td>
<td>Meningitis</td>
<td>Inner hair cells in cochlear damaged by virus</td>
</tr>
<tr>
<td></td>
<td>Mitochondrial Disorders</td>
<td>DNA - Maternal inheritance pattern</td>
</tr>
<tr>
<td></td>
<td>Moebius Syndrome</td>
<td>Connective tissue disorder, facial paralysis (cranial nerves 6 &amp; 7), middle ear anomalies</td>
</tr>
<tr>
<td></td>
<td>Muckle-Wells Syndrome</td>
<td>Onset in teens, urticaria, renal failure</td>
</tr>
<tr>
<td>N</td>
<td>Neurofibromatosis Type II</td>
<td>Intracranial tumours, 8th Cranial nerve, acoustic neuroma</td>
</tr>
<tr>
<td></td>
<td>Noonan Syndrome</td>
<td>Congenital heart defects, short stature, broad webbed neck, flat nasal bridge, hypotonia</td>
</tr>
<tr>
<td></td>
<td>Norrie Disease</td>
<td>Eye disorder, auditory impairment</td>
</tr>
<tr>
<td>O</td>
<td>Oculo-Auriculo-Vertebral Syndrome (OAV) (aka Goldenhar Syndrome)</td>
<td>Facial asymmetry, anomalies of external, middle ear, cranial nerve</td>
</tr>
<tr>
<td></td>
<td>Olmsted Syndrome</td>
<td>Rare, infantile onset of hyperkeratosis of palmar and plantar surfaces</td>
</tr>
<tr>
<td></td>
<td>Optic Atrophy and Polyneuropathy</td>
<td>Progressive visual loss, polyneuropathy in childhood</td>
</tr>
<tr>
<td></td>
<td>Ototoxic Medication</td>
<td>Cause damage to hair cells of the inner ear</td>
</tr>
<tr>
<td></td>
<td>• Aminoglycoside antibiotics (Neomycin, Amikacin, Gentamycin, Kanamycin, Sisomicin, Tobramycin, Dibekacin, Streptomycin)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Frusemide (loop diuretic) - used in conjunction with Antibiotics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Quinine (malarial treatment)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Osteogenesis Imperfecta</td>
<td>“brittle bones”, stapes malformation</td>
</tr>
<tr>
<td>P</td>
<td>Paget's disease</td>
<td>Juvenile skeletal disorder, bone pain, swelling</td>
</tr>
<tr>
<td></td>
<td>Persistent Pulmonary Hypertension of the Newborn (PPHN)</td>
<td>Ventilation, progressive hypoxia, persistent foetal circulation</td>
</tr>
<tr>
<td></td>
<td>Pierre Robin Syndrome</td>
<td>Craniofacial anomaly, micrognathia, glossoptosis, may have cleft palate</td>
</tr>
<tr>
<td></td>
<td>Periauricular Abnormalities</td>
<td>Ear canal atresia, facial paralysis (Pits and tags excluded)</td>
</tr>
<tr>
<td></td>
<td>Periventricular Leukomalacia (PVL)</td>
<td>Ischaemic cystic changes in the brain matter predisposing to Cerebral palsy</td>
</tr>
<tr>
<td>P</td>
<td>Piebaldness</td>
<td>Lack of pigment in hair, ataxia, blue irides</td>
</tr>
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<tr>
<td></td>
<td>Pendred Syndrome</td>
<td>Thyroid goiter - iodine imbalance in inner hair cells</td>
</tr>
<tr>
<td></td>
<td>Pyle’s Syndrome (Pyle Disease)</td>
<td>Enlargement and sclerosis of the facial bones, ribs, clavicles</td>
</tr>
<tr>
<td>R</td>
<td>Refsum Syndrome (Refsum Disease)</td>
<td>Organ of Corti degeneration, inner ear anomalies, eye disorder</td>
</tr>
<tr>
<td></td>
<td>Richards-Rundle Syndrome</td>
<td>CNS disorder, ataxia, muscle wasting</td>
</tr>
<tr>
<td>S</td>
<td>Stickler Syndrome</td>
<td>Flattened facial profile, cleft palate, ocular changes</td>
</tr>
<tr>
<td>T</td>
<td>Treacher Collins Syndrome</td>
<td>Head and neck anomalies, atresia of canal, abnormal middle ear</td>
</tr>
<tr>
<td></td>
<td>Trisomy 21 (Down Syndrome)</td>
<td>Recurrent middle ear infections</td>
</tr>
<tr>
<td></td>
<td>Trisomy 13, 15 &amp; 18</td>
<td>High mortality rate</td>
</tr>
<tr>
<td></td>
<td>Turner Syndrome</td>
<td>Gonadal dysgenesis, webbed neck &amp; digits, micrognathia</td>
</tr>
<tr>
<td>U</td>
<td>Usher Syndrome</td>
<td>Retinitis pigmentosa, tunnel vision, vertigo, organ of Corti degeneration</td>
</tr>
<tr>
<td>V</td>
<td>Ventilation</td>
<td>Mechanical ventilation for longer than 5 days - increased neonatal risks</td>
</tr>
<tr>
<td></td>
<td>Van der Hoeve Syndrome</td>
<td>&quot;brittle bone&quot;, stapes malformation</td>
</tr>
<tr>
<td></td>
<td>Vohwinkel-Nockemann Syndrome</td>
<td>Hyperkeratosis of palms, soles, knees, elbows, fingers and toes.</td>
</tr>
<tr>
<td></td>
<td>Von Recklinghausen Syndrome</td>
<td>Hyperkeratosis of palms, soles, knees, elbows, acoustic neuroma, renal</td>
</tr>
<tr>
<td>W</td>
<td>Waardenburg Syndrome (Type 1 &amp; 2)</td>
<td>White forelock, iris colour different in one eye, prominent mandible, cleft</td>
</tr>
<tr>
<td></td>
<td>Wildervanck Syndrome</td>
<td>Dysmorphic facial features, atresia of ear canals, eyeball retraction</td>
</tr>
<tr>
<td></td>
<td>Winter Syndrome</td>
<td>Renal anomalies, genital malformation, malformed ear and canals</td>
</tr>
</tbody>
</table>

References
John Muir Medical Centre USA (2000) - Hearing loss indication list
Northern and Downs (2002), Hearing in Children 5th edition
Newton (2002), Paediatric Audiological Medicine
Patricia Gillilan - Audiologist USA

Date last reviewed:  May 2017
Due for review:  2020
Appendix 6 – Troubleshooting Measures for the AccuScreen

Please refer to the following two pages for troubleshooting information for the AccuScreen regarding:

- Conducting an equipment check, and
- Controlling the screening conditions.

These pages can be printed for easy reference in your clinical area.
Appendix 6: Troubleshooting AccuScreen

Conducting an Equipment Check:

Electrode Cable, and Coupler or Hug Cable:

1. Turn on the AccuScreen by long-pressing the button on the side.

2. Select, **USER = Staff ID#** from the list.
   Enter your **PASSWORD: “Abcd”**
   (Then select the facility and location by pressing the only button selection on each following screen).

3. Attach the Electrode Cable ends to the metal bars of the ABR tester, and insert the Red and Blue coupler cable ends into the left and right side holes of the ABR tester.

4. Choose **Quality Tests** icon, and combined

   Perform a **manual listening check** by holding each speaker up to your ear before hitting combined to verify a chirp sound can be heard.
   Repeat the test for the other earhug/earcup cable (if both are supplied).

5. If all test are ok simply click ✅

   If the test failed, re-check the connections to the ABR tester and re-test.
   If the test failed twice. Replace faulty cable with spare cable and re-test until all tests OK appears.

   Contact Otometrics to arrange a replacement cable.

---

Chanel Grahame: 0450 528 725
Main Office: (02) 9111 5550
cgrahame@otometrics.com
Controlling screen conditions

Ensure the following noises isn’t interfering with your screen:

**Acoustical**

*Normal conversation level is >65dB HL 1m from the baby. 35dB HL is less than a whisper! NO AUDIBLE CHIRP = NO ABR = FALSE REFER.*

**Electrical**

*Florescent Lights and some medical equipment can also cause interference.

Turn off all electronic devices to be safe.

**Myogenic**

*Sucking, any movement, and just being awake/alert can potentially increase EEG.*

Also ensure you completely control the screening setup:

**LOW Impedances**

- < 4kΩ or Green is ideal for all sensors
- < 12kΩ or Yellow will slow you down
- > 12kΩ or Red will auto STOP the screen

**TIGHT Hug/Coupler Seals:**

*A break in the surrounding seal will cause background sounds to leak into the ear canal and slow down your screen times.*

Contact Otometrics if you have any questions.

**Matthew Whitehouse:** 0400 580 787  
**Main Office:** (02) 9111 5550  
mwhitehouse@otometrics.com
Appendix 7 – Cleaning AccuScreen Cables

Please refer to the next page for instructions on caring for and cleaning the AccuScreen cables.

The page can be printed for easy reference in your clinical area.
AccuScreen cables are durable and built to withstand everyday use. However all AccuScreen cables contain delicate components such as calibrated speakers and data memory which can be damaged if mishandled. Treat them with care and follow the tips below to ensure you achieve the maximum longevity with all AccuScreen cables:

- Gently roll the cable so it forms its natural memory circle, then place in the drawer or hang on a hook on the cart.
- Never kink or bend any cable in one place. Cables are like a metal paperclip, excessive bending at one point will make them break!
- Use “Tuffies” to clean cables and Accuscreen unit/touchscreen.
- While cleaning: Support cable end and wipe in opposite direction to minimise strain on cable.
- Never immerse ear coupler cable or ear hug cable in liquid.
- Alcohol wipes are only ok to use on sensor cable clips.

Contact Otometrics for calibration and support.

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cgrahame@gnotometrics.com
Appendix 8 – Screener Competency & Sample Training Program

Training Format & Competency Assessment
Guidelines for conducting training activities and assessing competencies are listed in the following table:

| Theory - Clinical Information and Screening Equipment Function and Operation | A variety of processes can be used:  
  - Lecture  
  - Demonstration and practice on model  
  - iLearn platform  
  - Question and answer session/s. |
|---|---|
| Practical Screening - Initial | Participants perform screens in pairs (or as determined by trainer) and are observed by trainer:  
  - One trainee performs screen and one records data  
  - Feedback should be provided immediately following screen (i.e. not with parent/s present unless necessary for successful completion of screen).  
  At least 2 screenings per trainee should be undertaken under these conditions. |
| Practical Screening - Independent | Screener performs screens alone – with direct or indirect supervision (to be determined by trainer).  
  5 screenings to be successfully performed under these conditions.  
  Competencies formally assessed by local/area Healthy Hearing Coordinator via:  
  - Observation of at least 2 complete screens  
  - Screener can complete iLearn quiz assessment online to generate a competency certificate which can be signed off by team leader  
  Feedback/Review process with trainer/co-ordinator. |

Annual mandatory competencies will consist of one practical screening assessment and the completion of the online e-Learning module iLearn: [https://ilearn.health.qld.gov.au/d2l/login](https://ilearn.health.qld.gov.au/d2l/login)

Guidelines for Assessing Practical Competencies
Specific competencies that must be demonstrated at the completion of training are detailed in the following table.

| Theoretical knowledge & understanding of evidence for universal newborn hearing screening | Demonstrates:  
  - a clear understanding of basic anatomy & physiology of the ear  
  - a basic understanding of the different types of hearing loss  
  - a clear understanding of the impact of a HL on speech & language development  
  - a good understanding of the state-wide and local policy in relation to screening protocols and procedures  
  - a clear understanding of the circumstances in which a child is listed for follow-up and identify the procedures involved  
  Can explain:  
  - the benefits of early identification of a hearing loss and resulting early intervention and/or management  
  - the normal developmental milestones for hearing and the importance of monitoring those with all babies |
| **Communication with parent/s and colleagues** | Provide a competent and complete explanation of the screening rationale and process used when offering a hearing screen to parent/s, including:  
• Benefits of early identification and intervention.  
• Description of how the screen is performed.  
• Likely duration of the screening process.  
• Possible results and their meanings.  
• Any follow up actions that might be required. |
| **Offering a hearing screen** | Seek informed consent from parents, providing an overview of the key contents of the HH Consent form prior to signature.  
Demonstrates:  
• appropriate language when communicating with parent/s  
• use translated HH resources &/or interpreter if necessary  
• sensitivity to possible concerns of parent/s & provide an opportunity for them to seek clarification in order to minimise parental anxiety  
• collaborative working practices, in liaising and problem-solving with other members of the maternity team in relation to the hearing screen including data collection, timing of screen, etc. |
| **Seeking informed consent** | Provide parent/s with any other information/explanations as necessary before, during or after the hearing screen.  
Remind parents at completion of screen what their baby’s results mean.  
Ensure parent/s have follow-up appointments at outpatients or with diagnostic services (audiology) if required. |
| **Screening methodology** | Demonstrates:  
• a clear understanding of the data which must be collected and recorded, its significance and the procedures for collecting and recording it  
• appropriate infection control measures when handling babies and using equipment  
• appropriate care in the use, cleaning, maintenance and storage of equipment  
• an understanding of appropriate actions should data be entered incorrectly/consumables be applied incorrectly. |
| **Technical aspects of conducting a screen** | Perform a complete screen, without supervision/feedback, demonstrating:  
• Appropriate baby selection  
• Selection of an appropriate environment  
• Accurate input of data to AccuScreen device  
• Appropriate skin preparation  
• Correct sensor connection and placement  
• Correct ear coupler / hug placement  
• Settling of the baby if disturbed during preparation.  
Monitor screen’s progress and troubleshoot appropriately.  
Correctly record data in the patient medical record, PHR Book, S&R Form.  
Perform an equipment check. |
Skills Assessment for Screening with the AccuScreen Newborn Hearing Screener

NAME: ___________________________  ID: __________ Assessor Name: ___________________________  ID: __________

Tick Applicable Box:  [ ] Assessment after 2 screens  [ ] Assessment after 5 screens  [ ] Annual assessment

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Newborn Hearing Screen Skills to be evaluated</th>
<th>Rating Scale</th>
</tr>
</thead>
</table>
| Screen offer    | Clear and accurate information given to parents / carer | C = Competent  
|                 | • Brochure in appropriate language provided &/or interpreter used | D = Needs Development 
|                 | • Reason / aim of screening program explained | S = Requires Supervision 
|                 | • Procedure described using clear, simple language and terms | C = Competent  
|                 | • Possible screening outcomes explained | D = Needs Development 
|                 | Consent obtained using form &/or interpreter in appropriate language | S = Requires Supervision 
|                 | Opportunities provided for parents / carer to ask questions | C = Competent  
| Baby selection  | Baby selected was eligible to screen and in an appropriate state | D = Needs Development 
|                 | Baby identity checked against ID labels and wristband, and verbally checked with parent | S = Requires Supervision 
| Data collection | • Healthy Hearing Screening & Referral Form completed correctly | C = Competent  
|                 | • Patient demographics and correct identifying name and medical record number | D = Needs Development 
|                 | • Hearing loss “high risk indicators” identified | S = Requires Supervision 
|                 | → Information obtained from medical record | C = Competent  
|                 | → Clarification with parent as required | D = Needs Development 
| Procedure       | Correct patient data / information entered into Accuscreen | S = Requires Supervision  
|                 | Confirmed that baby was in a quiet, settled state before proceeding | C = Competent  
|                 | Skin evaluated and prepared correctly | D = Needs Development 
|                 | Sensors placed correctly | S = Requires Supervision 
|                 | Ear couplers / hugs applied correctly | C = Competent  
|                 | Progress of screen observed and monitored | D = Needs Development 
|                 | • Ensured minimal environmental noise, myogenic, impedance values and EEG levels | S = Requires Supervision 
|                 | • ABR bar and Progress bars monitored | C = Competent  
|                 | • Troubleshooting undertaken before starting to minimize false refers | D = Needs Development 
| Screen outcome  | Screen outcome / result explained to parents | S = Requires Supervision  
|                 | Ongoing language milestone monitoring and Otitis Media risk discussed | C = Competent  
|                 | Parents / carer encouraged to ask questions and further information provided as required | D = Needs Development 
|                 | Appropriate follow-up process /action undertaken as required | S = Requires Supervision 
|                 | • AABR2 arrangements | C = Competent  
|                 | • Referral for diagnostic Audiology appointment within 2 to 6 week time frame | D = Needs Development 
|                 | • Referral to Family Support Service when ABR appointment required | S = Requires Supervision 
|                 | • Referral for Surveillance Audiology scenarios | C = Competent  
|                 | o Early Target Surveillance by 6wks | D = Needs Development 
|                 | o Routine Surveillance prior to 1st birthday | S = Requires Supervision 
| Post screen     | Written record / documentation process completed | C = Competent  
|                 | Communicated as appropriate with other care providers Nursing/Audiology/FSF/Medical | D = Needs Development 
|                 | Disposed of used equipment and completed infection control measures correctly | S = Requires Supervision 
|                 | Demonstrated appropriate equipment care & storage of cables | C = Competent  
| Housekeeping    | Performed Quality tests correctly – Combined – Electrode and ear coupler / hug cable | D = Needs Development 
|                 | Demonstrated knowledge of processes for faults, daily / weekly checks & annual ear coupler/hug cable calibration | S = Requires Supervision 
|                 | Aware of downloading process for patient screening data via docking station | C = Competent  

Competency:  [ ] Achieved  [ ] Interim (reassessment required)  [ ] Not Achieved

Comments/Recommendations:

Screener Signature: …………………………… / /  Assessor Signature: …………………………… / /