

# How are we doing? Audit of the Infant Audiology Diagnostic service at SCH

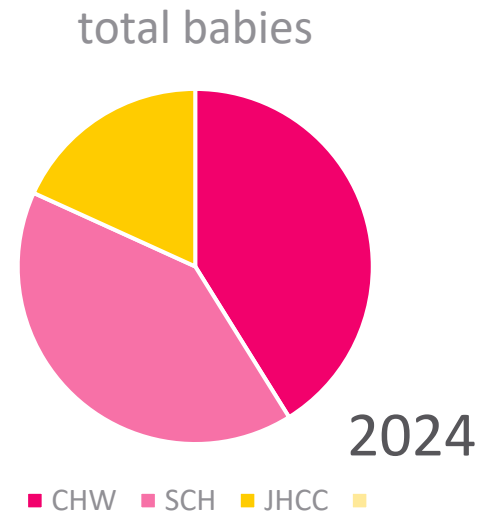
Florencia Montes, Andrew Geyl, Patricia Van Buynder  
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# Outline

- Overview of Infant Diagnostics in NSW
- Audit target
- NSW Minimum Standards for Infant Diagnostic Assessment (2024)
- Audit results
- Learnings/opportunities

## Infant Diagnostic centres in NSW

- 3 speciality Diagnostic centres
- Strategic decision to ensure high level of expertise
- SWISH travel subsidy has been implemented to assist those parents who need to travel more than 100km for the assessment.



## SCH appointment structure

- 1 FTE allocated to SWISH diagnostics
- 2 ABRs per day, 3-hour time slot for each baby
- One appointment only. Repeat indicated in cases of bilateral ANSD, mixed HL, inconclusive diagnosis, not enough information for management



## Background for the review

- SCH Audiology service has never been formally audited
- Recent development of state protocols and guides to measure against
- Recent examples nationally and internationally of Audiology service review

# Audit

- Retrospective record review of 103 babies with SNHL (uni and bilateral), 2017-2019

Audit targets:

- Age at completion of diagnostic assessment, 3m corrected age KPI
  - Number of appointments needed to complete assessment
  - Compliance with minimum information required for referral to HA
  - Diagnostic accuracy
  - Peer review: cosigning of waveforms
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- **HREC Reference: 2024/ETH01731**

# NSW minimum standards for Infant Diagnostic Assessment

- This document was developed in consultation with representatives from SCHN, JJCH, Nextsense, Canberra Hospital and Hearing Australia, with reference to the Australian Government 2023 National Framework for Neonatal Hearing Screening, the NSW Statewide Infant Screening Hearing (SWISH) guidelines, and the National Minimum Diagnostic Test Battery Standards for Neonates (PANDA group).

## Purpose of this guideline

To **standardise** and streamline neonatal audiological practice across NSW, to provide high quality and equity of diagnostic services.

To provide the **best audiological information** to determine the type and degree of the hearing loss, for hearing aid fitting and early intervention.

To guide local Protocols on **best practice**.

To have minimum standards Diagnostic services can be audited against, for **quality assurance and quality improvement**.

# Target performance indicators

- All families of eligible babies (refer result in one or both ears, or 'direct' refer) are contacted within 3 days of referral to be offered an appointment.
- Babies with a bilateral refer result are offered an appointment within 3 weeks of the referral, and babies with a unilateral refer or direct refer within 6 weeks.
- Diagnostic assessment is performed in both ears, with a range of objective tests.
- **Diagnostic assessment is completed by 3 months corrected age in ≥97% of infants.**
- **All ABR results are co-signed by a senior audiologist (at least 2 years-experience performing independent ABR), before a final diagnosis is given to the family.**
- All families are provided with their baby's preliminary diagnosis verbally, on the day.
- All families are provided with a written report stating the diagnosis and management plan and with relevant audiological resources (such as 'Hearing loss and your baby: the next steps'), within 5 days of the assessment.
- A written report and ABR waveforms, are saved in the patient's medical file, and a copy of the report is sent to SWISH Area Coordinator and relevant professionals involved in the management of the hearing loss.
- All families of babies with a permanent hearing loss are referred to Hearing Australia within 24 hours, following parental consent.
- All families of babies with a permanent hearing loss are offered a referral to medical services for investigations into the possible cause of the hearing loss and consideration of surgical interventions.
- All families of babies with a permanent hearing loss are offered emotional support through a social worker/family counsellor and parent to parent groups.
- An interpreter and an Aboriginal Liaison officer should be made available to the family when requested.
- All families who actively decline audiological assessment, or repeatedly fail to attend their scheduled appointment or are not contactable, are referred to social work for extra support. If family still refuses to attend, is not contactable, a letter is sent with information regarding the importance of the hearing assessment and offering behavioural assessment at a later stage. DNA/No shows numbers are monitored by Diagnostic Managers.
- All families of babies with a permanent hearing loss are aware of Early Intervention services.
- **An internal clinical audit of the minimum standards occurs at least every 2 years.**

# Satisfactory levels for discharge (in dB eHL):

- Levels are adjusted for transducer, stimuli, and age
- The below levels are in combination with present DPOAEs
- Minimum test frequencies: 500 Hz and 2 KHz, or 1 and 4 KHz

500 Hz	1000 Hz	1000 Hz	1000 Hz
≤25 dB eHL	≤25 dB eHL	≤25 dB eHL	≤25 dB eHL

We test down to 20 dB eHL

# Minimum information required for referral to Hearing Australia

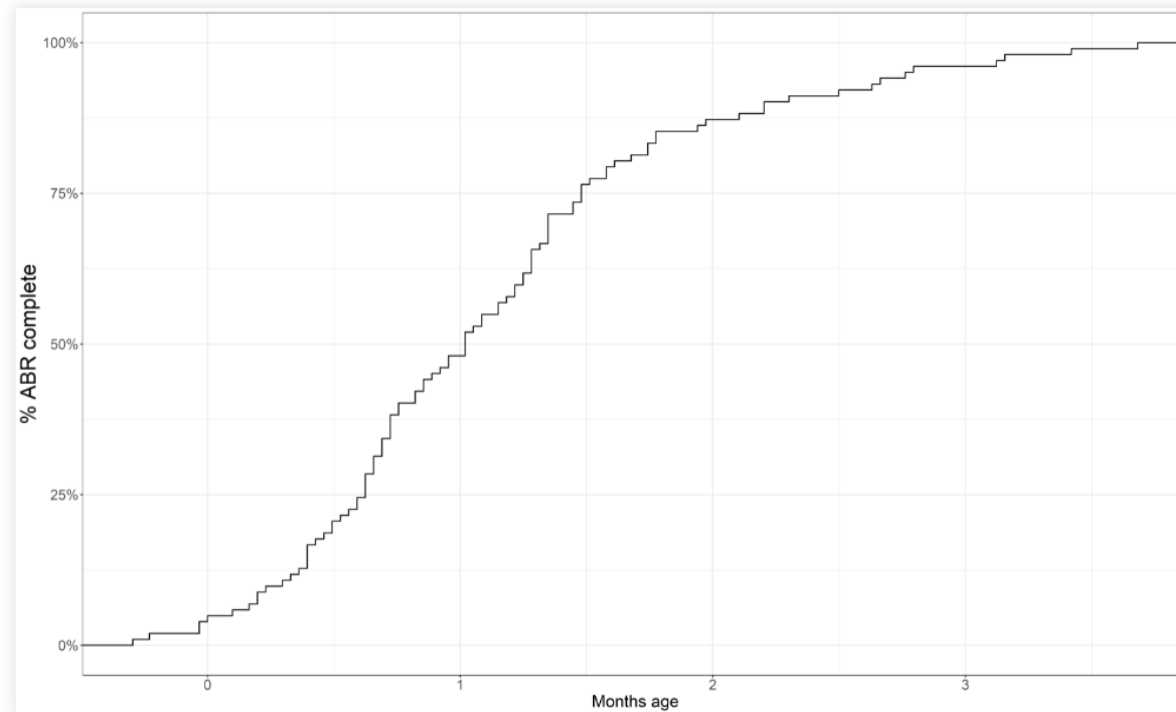
- *In cases of sensorineural hearing loss (SNHL)*: a minimum of **three AC thresholds** (500 Hz, 2KHz and 4 KHz,; or 500 Hz, 1KHz and 4 KHz), and **one BC threshold** is required.
- *Cochlear Microphonic (CM) testing* should be performed in cases with absent/abnormal ABR waveforms (Appendix B)
- *In cases of a mixed hearing loss*, a minimum of two AC thresholds and 2 BC thresholds, at frequencies one octave apart.
- *In cases of permanent CHL*: two AC thresholds and two BC thresholds, at frequencies one octave apart.

# Audit Results



# KPI Age at completion of ABR

Percentage of babies with completed ABR by a given age



## Minimum information required for referral to HA (103 babies)

- Number of **AC** frequencies

88.4% of babies had  $\geq 3$  AC frequencies (this was not a KPI during the audit period)

- At least one **BC** on each ear:

25% BC not done, diagnosis was made based on normal tymps and absent OAEs

7 had a reason stated (sleeping time, equipment, alarm..)

4 babies had BC in one ear only

## Diagnostic accuracy:

- Difference in ABR (best ear) and first VROA results
- Significant difference defined as  $> 15$  dB, in at least one frequency
- When disagreement, waveforms were reviewed by two senior Audiologists: quality of the ABR (meeting criteria for clear response presence/absence)
- Of the 103 records reviewed:
- 23 were removed: missing VROA results, different frequencies tested
- 16/80 significant difference in at least 1 frequency (20%) and ABR was reviewed. Most (13) ABRs were satisfactory, and deterioration presumed to be natural course of the HL or middle ear. For 2 babies residual noise did not meet criteria (one baby was tested at 11 months corrected age during CPAP break), one baby hearing recovered (2xABRs of good quality, OAEs gradually appeared)

## Peer review

- 100 % of waveforms were co-signed by another audiologist.

At SCH waveforms are co-signed by another Audiologist before delivering the news. Also, waveforms are emailed to all infant diagnostic audiologists for review/learning opportunity/transparency.

- Few situations where the testing audiologist was the only one on site on the day (leave) and co-signing happened by either by an external audiologist, or the following day

## Were we able to complete assessment in 1 appointment (103 babies)?

- 88.35% of babies had diagnosis 'completed' in the one appointment .

25% did not have BC completed. Lack of time was not stated as the reason why it was not completed, potentially this could've been improved by prioritising BC over 4 AC frequencies

- 12 babies had 2 appointments to complete assessment (11.65%)

## Positives

- 98% of babies were diagnosed  $\leq 3$ m of corrected age, 80 %  $\leq 2$  m corrected age
- Most babies had ABR meeting criteria for a clear/absent response
- Waveforms were co-signed

# Opportunities

- Regular audit process. Opportunity for learning and service improvement
- HA reporting back to diagnostic centres at two points: letter of attendance to first appointment, first reliable audiogram. Opportunity for audit of diagnosis outcome/learning and improvement
- BC testing was lacking during the audit period, is now part of minimum requirement and if not obtained in the first appointment, family is offered a repeat assessment. This was audit for 2024, there were 5 cases with profound hearing loss and 1 with a mild hearing loss at 4 KHz only where BC was not done (11%, significant improvement).
- Documentation (why target was not met)



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