Safety and quality in infant diagnostic audiology: A human factors approach

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Background

Audiologists in Queensland's public sector typically alert the Healthy Hearing Program of cases with unexpected findings (e.g. children with normal infant diagnostic audiology findings who are later diagnosed with permanent hearing loss, children initially diagnosed with permanent hearing loss who are later found to have normal hearing) or where a concern or query of a clinical nature arises. Formerly, this process had several limitations:

(1) Responsibility for case review sat with a single audiologist with no formalised pathway to provide feedback or communicate risk to audiology service managers. Generally, cases were reviewed against the Healthy Hearing diagnostic protocol and any practice issues noted were discussed with the diagnostic audiologist.

(2) Review findings and recommendations were not systematically registered or quantified, limiting the opportunity to understand individual, service or program level risks and opportunities for improvements in safety and quality.

CASE REVIEW RISK MATRIX					
	Clinical Significance of the Scenario	Direct Clinical Care (assessment, clinical reasoning, integration of results, counselling etc.)	Clinical Management and Administration (reporting, timelines, onward referrals etc.)	Clinical Impact on the Child	Ongoing Service Risk
5	Major clinical significance (e.g. missed/delayed diagnosis, condition requiring urgent follow-up such as SNHL following meningitis)	Major omission/error in assessment, intervention, or interpretation, directly resulting in missed or significantly delayed diagnosis/management or prolonged period with no access to sound	Major omission/error in required follow-up/reporting or processes directly resulting in missed or significantly delayed diagnosis/management	Confirmed preventable permanent harm (SAC1)	Almost Certain The identified issue will recur in most circumstances
4	Substantial clinical significance (e.g. missed/delayed diagnosis or management, moderate or greater bilateral permanent hearing loss)	Omission/error in assessment, intervention, or interpretation, directly resulting in incorrect/ delayed diagnosis or no/limited access to sound	Omission/error in required follow-up/reporting or processes directly resulting in incorrect/ delayed diagnosis/management	Likely preventable permanent or long-term harm (SAC2)	Highly Likely The identified issue will recur frequently
3	Moderate clinical significance (e.g. missed/delayed diagnosis or management, mild to moderate bilateral permanent hearing loss)	Deviation from clinical protocol or error in interpretation resulting in possible missed/incorrect/delayed diagnosis/prolonged period with inadequate access to sound	Deviation from protocol with regard to required follow-up/reporting or processes resulting in possible missed/incorrect/ delayed diagnosis	Possible preventable long-term harm (SAC2)	Likely The identified issue will probably recur at least once
2	Minor clinical significance (e.g. missed/delayed diagnosis or management, moderate or greater transient conductive hearing loss or mild or unilateral permanent hearing loss)	Minor deviation from clinical protocol or error in interpretation resulting in minor impact to child's diagnosis or management/non-optimal access to sound	Minor deviation from protocol with regard to required follow-up/reporting or processes resulting in possible missed/incorrect/ delayed diagnosis/management/non-optimal access to sound	Likely preventable minimal/negligible harm (SAC 3)	Possible The identified issue could recur at some time
1	Minimal clinical significance (e.g. missed/delayed diagnosis or management, mild or unilateral transient conductive hearing loss)	Minor deviation from clinical protocol or error in interpretation that did not directly impact child's diagnosis or access to sound	Minor deviation from protocol with regard to required follow-up/reporting or processes that did not impact on child's diagnosis/management/access to sound	Possible preventable minimal/negligible harm (SAC 3)	Unlikely The identified issue could recur at some time but is not expected
0	None or inconsequential (e.g. normal hearing)	Correct assessment and reasoning	Correct management and administration	No harm	No service risk was identified, or the identified issue is unlikely to recur or was due to unique circumstances

Paediatric Clinical Council

Recent national and international audiology quality and safety incidents prompted the Queensland Health and Mater Audiology Governance Group (AGG) to review statewide governance. In 2024 a Paediatric Clinical Council (PCC) was appointed, comprising AGG representatives and subject matter experts. An electronic notification form was developed for audiologists to report cases involving potential clinical errors or safety concerns. The PCC reviews these cases and quantifies risk across 5 domains using a standardised risk matrix. A formal report provided to the audiology service's operational manager details the considerations behind the risk rating and provides case and clinic level recommendations to mitigate future risk. A future goal is to survey operational managers to understand whether this process highlighted risks of which they were previously unaware, and to what extent recommendations have been implemented.

Human Factors Approach

If a clinical error or near miss is identified, the PCC applies learnings and provides recommendations using a human factors approach. This approach recognises that humans are fallible and seeks to enhance safety by understanding the complex interactions between humans, technologies, tasks, processes, and organisations. Review recommendations address these other elements of the work system to mitigate the impacts of human error. This is in contrast to a culture that denies the existence of systemic weaknesses and names, blames, shames and retrains clinical staff when something goes wrong[1]. A theoretical example is provided below:

Reason for notification: An infant referred for medical investigation following a diagnosis of sensorineural (cochlear) hearing loss was found to have an absent cochlear nerve indicating a retrocochlear aetiology.

PCC findings: A cochlear microphonic response was missed due to sub-optimal trace scaling and reported as absent. The audiologist documented their intention to repeat cochlear microphonic testing, but this was missed by a second audiologist who conducted the review assessment.

Recommendations: Technology issue - change default scaling in the cochlear microphonic test protocol. Process issue – book patients with same clinician for continuity of care where possible; review clinic handover processes/tools.

Queensland Government