

**AUSTRALIAN CONSENSUS STATEMENT
ON UNIVERSAL NEONATAL HEARING SCREENING,
Adelaide, March 2001**

-Ratified by the Australian National Hearing Screening Committee, November 2001-

This Consensus Statement was agreed upon at 'Universal Neonatal Hearing Screening in Australia: a National Forum for Consensus and Implementation', held on 24 March 2001 at the Women's and Children's Hospital, Adelaide. There were over 110 participants from all states and territories of Australia, including audiologists, teachers of the hearing impaired, neonatologists, paediatricians, ear, nose and throat surgeons, nurses, epidemiologists, and parents of children with hearing impairment

The Forum notes that:

1. Hearing impairment is a significant condition in newborns. Significant permanent hearing impairment (defined here as hearing impairment of more than 40 dB HL in both ears) affects 1-1.5 per 1000 live births,^{1, 2} or approximately 250-400 births in Australia each year. This is more frequent than other conditions for which newborn screening occurs.³ Significant bilateral hearing impairment, if undetected, will impede, and can have profound effects on speech, language, and cognitive development,⁴ and thus emotional and social well-being. Unilateral and mild hearing impairments can also have significant educational impacts.⁵
2. Current international research indicates that babies whose permanent bilateral hearing impairment is diagnosed before the age of six months, and who receive appropriate and consistent early intervention, have significantly better language levels than those children identified after the age of six months.^{6, 7} Of children aged 5 years with permanent significant hearing impairment, it is estimated that 80-90% have had the impairment since the neonatal period.^{8, 9}
3. Acceptable technologies are now available, viz., measurement of otoacoustic emissions (OAE) and automated measurement of the auditory brainstem response (A-ABR), that enable effective screening of hearing impairment in newborns during natural sleep or quiet rest. Such technology has been used in screening programs since 1990.^{9, 10}
 - Research studies of universal (i.e. non-targeted) screening programs using OAE and A-ABR show sensitivity (proportion of infants with abnormal hearing who fail the screen) close to 100%, and specificity (proportion of infants with normal hearing who pass the screen) above 90%.^{10, 11}
 - Research studies using currently manufactured A-ABR equipment can achieve false-positive rates as low as 2%.³
4. The average age of diagnosis of hearing impairment in some centres which have implemented universal newborn hearing programs is reported to be as low as 3 months.^{2, 10} In contrast, the average age of diagnosis of hearing impairment in centres which screen only infants known to have pertinent risk factors is estimated at 24 months.¹² Data from Australian Hearing indicate that the median age at detection of Australian children with the most severe hearing impairment (>90dB) is between 12 and 18 months while the median age at detection of children with moderate hearing losses (40-60dB) is between 4 and 5 years.
5. Estimates of the cost of hearing screening per child are of the order of \$25 to \$50, depending on the technology used and how the program is delivered, and are consistent with experience in other countries.^{3, 9, 10} Testing in more remote areas will be more expensive. It is likely that the cost of a successful program will be offset within a few years by the consequent reduction in the cost of the higher teacher-student ratio and greater life-long support required for children whose hearing impairment is diagnosed late.³
6. Although there is variable access to full audiological assessment for infants, especially outside metropolitan areas, Australia already has excellent facilities for audiological rehabilitation. The fitting and monitoring of hearing aids is financially accessible to all Australian children as a result of federal government funding.
7. Thus the WHO preconditions¹³ for the establishment of a screening program are fulfilled.

8. The American National Institutes of Health Consensus Statement, 1993,¹⁴ the European Consensus Statement, 1998,¹⁵ the American Academy of Pediatrics, 1999,⁴ and the US Joint Committee on Infant Hearing¹⁶ have all supported the introduction of screening. It is mandatory to offer neonatal screening in most states of the USA. Universal newborn hearing screening is being implemented nationally throughout England and Wales. A large scale trial of newborn hearing screening is currently under way in Western Australia.

The Forum believes that:

1. Universal neonatal hearing screening is feasible, beneficial, and justified.
2. Principles of equity and efficiency demand the establishment of a high quality program of universal neonatal hearing screening in Australia as soon as possible.
3. Prompt audiological assessment must be achieved for all neonates identified by hearing screening, and prompt, effective intervention must follow for those in whom the impairment is confirmed.
4. To be effective, a neonatal hearing screening program should
 - be universal (i.e., include all neonates), since selective screening based on high-risk criteria in practice detects at most half of all infants with congenital hearing loss.^{2,9}
 - achieve high coverage and follow-up rates, relative to the total number of births in the population.
 - be comprehensive in its approach, ie it should include training and supervision of personnel, full and accessible information for parents at all stages of the program, quality assurance, the follow-up of identified children, systems for reporting and monitoring outcomes, and counselling for parents of children with hearing impairment.⁹
5. Models for the delivery of a neonatal hearing screening program need to be designed to take account of Australian patterns of population distribution and service delivery.
6. Effective universal neonatal hearing screening will not replace the need for vigilance and for continued surveillance of hearing behaviour and language development to detect hearing impairment in children who have not received neonatal screening or who develop permanent hearing loss at a later age.
7. Further research is required to determine benefits, costs and harms of screening for children with unilateral and milder hearing impairments.

The Forum resolves that:

1. A program of universal neonatal hearing screening should be introduced across all states and territories in Australia in order to detect children with hearing loss at the earliest possible age.
2. The Australian federal government should work together with state and territory governments to establish a coordinated screening program.
3. A universal hearing screening program must be sufficiently resourced to enable high quality monitoring and evaluation.
4. A range of national strategies will be necessary to achieve effective and efficient universal neonatal hearing screening programs for all Australian children.
5. Clear time lines should be specified for the planning and implementation of universal neonatal hearing screening across Australia.
6. Audiological assessment, diagnosis and habilitation at the earliest possible age, as well as parental support, should be achieved for all Australian children with hearing impairment.

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