



## Universal newborn hearing screening in South Africa — a First-World dream?

Early detection and intervention for hearing impairment has become an increasingly important aspect of neonatal care in developed countries.<sup>1,2</sup> Rising numbers of universal newborn hearing screening (UNHS) programmes have been implemented to facilitate an optimal outcome for infants with hearing impairment.<sup>3</sup> These UNHS programmes are justified for the following reasons.

Firstly, the prevalence of hearing impairment is significantly higher than other birth defects.<sup>4</sup> Screening for sensorineural hearing impairment will identify 260/100 000 afflicted infants compared with 50/100 000 with congenital hypothyroidism, the most common congenital condition routinely screened for in the USA.<sup>4</sup> Secondly, undetected hearing impairment leads to irreversible language, speech and cognitive delays, with far-reaching social and economical ramifications.<sup>2,3,5</sup> In the USA a deaf person's average income after high school is 30% lower than that of a hearing person, and the combined expense of specialised education and loss of productivity results in an average lifetime cost of more than US\$1 million.<sup>5</sup> Thirdly, UNHS yields dramatic benefits since infants whose hearing impairment is identified before 6 months of age have significantly better language abilities than those whose hearing impairment is identified later.<sup>3</sup> The reason for this is that with intervention (hearing aid fitting and supportive services) before the age of 6 months, infants are enabled to develop and maintain normal language skills in keeping with their cognitive development.<sup>3</sup> This is in stark contrast with the persistent language delay of 2 - 4 years for infants identified after 6 months of age.<sup>3</sup>

The justification for UNHS also applies to developing countries and underscores their responsibility to initiate early identification and intervention programmes. South Africa has taken the first step towards UNHS in the form of a Hearing Screening Position Statement conceptualised by the Professional Board for Speech, Language and Hearing Professions<sup>6</sup> of the Health Professions Council of South Africa (HPCSA). This position statement is based on the Year 2000 Position Statement of the Joint Committee on Infant Hearing in the USA<sup>2</sup> and proposes screening of high-risk infants, i.e. targeted hearing screening. These are infants with a family history of permanent childhood hearing impairment, craniofacial abnormalities, a syndrome associated with hearing impairment, an *in utero* infection due to herpesvirus, cytomegalovirus, toxoplasmosis, rubella or syphilis, and infants who had been admitted to a neonatal intensive care unit for more than 48 hours.<sup>2</sup> Infants should be identified and

screened before discharge. If missed, they should be screened at the 6-week immunisation visit.<sup>6</sup> Diagnosis of the type, degree, and configuration of hearing impairment should be completed by 3 months of age and intervention initiated before 6 months of age.<sup>2,6</sup>

Targeted infants are also at risk for delayed and progressive hearing impairment.<sup>2,6</sup> These infants must be screened periodically, as well as those with the following additional risk indicators: (i) caregiver concern regarding hearing, speech, language, and/or developmental delay; (ii) postnatal infections associated with sensorineural hearing impairment including bacterial meningitis; (iii) neonatal conditions in particular hyperbilirubinaemia requiring exchange transfusion and those complicated by severe hypoxaemia such as persistent pulmonary hypertension of the newborn; (iv) recurrent or persistent otitis media with effusion for at least 3 months; (v) head trauma; (vi) syndromes associated with progressive hearing impairment such as neurofibromatosis, osteopetrosis and Usher's syndrome (retinitis pigmentosa-deafness syndrome); (vii) neurodegenerative disorders, such as Hunter's syndrome; and (viii) sensory motor neuropathies, such as Friedreich's ataxia.<sup>2</sup> The high-risk indicators for hearing impairment are evident in approximately 10% of all newborn infants and this group comprises approximately 50% of infants with congenital hearing impairment.<sup>7</sup> The remaining 50% are term, normal infants whose hearing impairment is missed using targeted screening.<sup>7</sup> It is for this reason that screening of high-risk infants is only an interim step towards UNHS. The final goal specified by the South African Hearing Screening Position Statement is to screen 98% of all newborn infants by 2010.<sup>6</sup>

The South African Hearing Screening Position Statement<sup>6</sup> provides valuable direction by setting standards where none existed previously. It does, however, remain essential to assess the recommendations critically within the South African context and also, more specifically, within the infrastructure of existing audiological and otological health care services. Despite the reduced cost of the contemporary physiological hearing screening methods, namely oto-acoustic emissions (OAEs) and auditory brainstem responses (ABRs), and their low false-positive rates (3 - 5%),<sup>1</sup> assessment of real cost and efficiency using pilot studies is essential before the widespread implementation of UNHS. This is especially relevant in South Africa, a resource-poor country with a high rate of illiteracy, where a non-life-threatening yet debilitating condition such as hearing impairment is not receiving the institutional support,



research funding and political advocacy it deserves. The ability to identify hearing impairment at birth does not mean we in South Africa are ready to deal with the responsibilities and consequences of UNHS.<sup>1</sup> Contextual research regarding epidemiology and prevalence, especially for unique populations such as HIV-infected infants, is crucial alongside surveys assessing hearing health care services. These data are necessary to ascertain the nature and impact of hearing impairment in infants and the standard and scope of otological and audiological services in South Africa to ensure a relevant course of action. A UNHS programme should be incorporated into primary and secondary health care to ensure that it becomes an integral part of a health and education programme.<sup>1</sup>

The initiator of UNHS in the USA,<sup>8</sup> Marion Downs, is confident that the Western world will soon see most newborns enrolled in UNHS programmes and has urged these countries to assist developing countries to follow suit. South Africa should therefore access international resources to guide and support innovative, context-specific research endeavours for the planning of screening programmes that improve hearing

health care for all infants in a cost-effective and accountable manner.

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