



Early detection of infant hearing loss in South Africa

Every day close to 2 000 babies are born with or acquire permanent bilateral hearing loss within the first few weeks of life,¹ and at least 90% of them live in developing countries like South Africa. Infant hearing loss is undetectable by routine clinical examination, and if screening is not provided it is only identified after critical developmental periods for language acquisition have passed. The far-reaching effect of late identification is evident in poor linguistic, cognitive and socio-emotional development, which undermines literacy skills, academic achievement and ultimately educational and vocational outcomes.² Fortunately infants with hearing loss have excellent outcomes, potentially matching those of their hearing peers, if the loss is identified early and intervention initiated by 6 - 9 months of age.² For this reason screening programmes have been set up in countries such as the USA and UK, where more than 95% of all newborns are screened to ensure that those with hearing loss are given the opportunity to develop to their maximum potential alongside their hearing peers.²

Current situation

It is estimated that in South Africa, approximately 6 116 babies a year are born with permanent bilateral hearing loss or acquire it in the first weeks of life. This means that every day 17 babies are born with or will develop hearing loss, 15.5 of them in the public health sector.¹ At present the primary mode of identification of these infants is passive through parental concern about perceived delays in speech development, abnormal behaviour or otitis media complications. Owing to the absence of infant screening programmes hearing loss is on average only diagnosed after 2 years of age, with a further delay of 8 months from diagnosis to intervention.³

A national survey in the public health care sector of South Africa indicated that no more than 7.5% of public hospitals provide any form of infant hearing screening and less than 1% offer some form of universal screening, which is the recommended standard of care.^{2,4} There are no current surveys documenting the status of early identification programmes in the private health sector, and these services are entirely dependent on individual initiatives by paediatricians and audiologists. This important service therefore remains unsystematic and unavailable in most hospitals.¹

Considering the status of newborn hearing screening in the private health sector and evidence from the public sector, it is conservatively estimated that less than 10% of newborns and infants in South Africa have any prospect of having their hearing screened.⁴ We therefore miss diagnosing incapacitating hearing loss in approximately 5 500 children annually.

Consequences of undetected hearing loss

The consequences of and costs associated with undetected hearing loss are pervasive and far-reaching. For children with undetected infant hearing loss critical developmental periods for optimal language acquisition are forfeited. Persistent delays in language, speech and cognitive development restrict acquisition of proficient literacy skills, which prohibits academic achievement, resulting in diminished vocational prospects and poor societal participation and contribution.^{2,5}

However, not only infants living with permanent hearing loss and their families suffer the consequences of late identification. Evidence demonstrates significant long-term societal costs as a result of increased expenses for specialised education and losses in productivity due to unemployment and underemployment, in contrast to proven long-term cost savings associated with early identification of infant hearing loss.^{2,5,6} It is much more difficult to ascertain the loss in quality of life for those who are isolated, stigmatised and severely restricted in life opportunities due to late identification of hearing loss.

The case for early detection

In stark contrast to the effects of undetected infant hearing loss, the benefits of early detection and intervention are dramatic. Accessing the critical developmental periods for language acquisition during the first year of life through early detection, followed by personal amplification with hearing aids or cochlear implants and subsequent family-centred intervention, may offer children developmental outcomes comparable to those of their hearing peers.^{2,5} Furthermore, long-term economic benefits of universal screening programmes for hearing loss indicate reduced costs for specialised education and social welfare and improved lifetime productivity compared with the initial costs of universal newborn screening programmes.⁶

Screening devices for hearing loss have improved with technological advances, and sensitivity and specificity scores are now close to 100%.^{2,5} Behavioural screening with noisemakers is grossly inaccurate, and recommended screening technologies include oto-acoustic emissions (OAE), which assess cochlear functioning, and auditory brainstem responses (ABR), which record neural activity in response to sound. These devices are now either handheld or portable with automated pass/fail criteria making it possible for non-specialist personnel with adequate training to conduct the screening (tests take 1 - 3 minutes on a quiet baby). Consumable costs are low, especially for OAE screening, and device costs vary between R 30 000 and R80 000.



Audiological services in the public and private health care sector of South Africa are also well positioned to provide the necessary follow-up services such as diagnostic assessments and prescribing and fitting personal amplification devices.⁷ Hearing aids are provided free of charge for children in the public health care sector and although challenges remain, such as long waiting lists and inadequate equipment, the infrastructure and legislative mandate is in place.^{1,7} The importance of early communication intervention services to follow up on newly identified infants with hearing loss cannot be over-emphasised. Service providers such as speech-language therapists and early interventionists are essential, and as programmes identify more infants, services will need to be scaled up. An early intervention initiative providing free home-based intervention services for infants with hearing loss from 0 to 3 years of age (HI-HOPES) has also recently been launched in several provinces to address this growing need.¹

Although challenges remain, South Africa is ready for the widespread implementation of infant hearing screening programmes and the outcomes for those identified early have never looked brighter.

Current priorities

The Health Professions Council of South Africa's position statement on Early Hearing Detection and Intervention Services in South Africa⁷ provides guidelines and recommendations for contextually relevant programmes. In the public health care sector pilot programmes are an important step towards instituting widespread infant hearing screening. Targeting high-risk populations such as neonatal intensive care cohorts is a good starting point for hospitals. For well babies alternative screening strategies may be necessary, since infants are discharged on the same day and screening may be difficult to co-ordinate. In such cases 6-week immunisation visits may serve as a useful platform for screening, as has been demonstrated in other developing countries.^{7,8} Well-established pilot programmes can be scaled up and the empirical evidence from such initiatives garners legislative support. The first pilot programme supported by provincial government is being rolled out to clinics in each of the eight districts in Cape Town during 2009.¹ More such initiatives are needed at secondary and tertiary levels and in other provinces. Without sufficient support from the Department of Health little progress can be made in the public health sector where most infants with hearing loss are born.

In private hospitals where the concept and implementation of newborn hearing screening is not currently endorsed as part of the maternal package of birthing services, support from

management is crucial for a successful screening programme. Hospitals should include the screening of all newborns as part of the birthing package and not view it as an optional service.

Finally, we must increase awareness and advocacy at all levels for those who cannot speak for themselves. Paediatricians are best placed to emphasise and promote the importance of early identification to parents, hospital management and other health care providers. In collaboration with audiologists, hearing screening programmes should be implemented and managed as part of an integrated service delivery package. Effective follow-up and referral networks are also important to ensure that those at highest risk of hearing loss are tracked and provided with appropriate services in time to access the critical periods for language development.⁷

There is no alternative to newborn and infant hearing screening programmes, using physiological screening techniques, to identify hearing loss early enough. Only through systematic early detection programmes will infants with hearing loss in South Africa be assured of a chance to develop their full potential to become fully active, contributing and integrated members of society. For their sake, and ours, we cannot afford to waste any more time.

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References

1. Swanepoel D, Störbeck C, Friedland P. Early hearing detection and intervention services in South Africa. *Int J Pediatr Otorhinolaryngol* 2009; doi: 10.1016/j.ijporl. 2009.01.007.
2. Joint Committee on Infant Hearing (JCIH). Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. *Pediatrics* 2007; 120: 899-921.
3. Van der Spuy T, Pottas L. Infant hearing loss in South Africa: Age of intervention and parental needs for support. *Int J Audiol* 2008; 47: S30-S35.
4. Theunissen M, Swanepoel D. Early hearing detection and intervention services in the public health sector of South Africa. *Int J Audiol* 2008; 47: S23-S29.
5. US Preventive Services Task Force. Universal Screening for Hearing Loss in Newborns: US Preventive Services Task Force Recommendation Statement. *Pediatrics* 2008; 122: 143-148.
6. Schroeder L, Petrou S, Kennedy C, et al. The economic costs of congenital bilateral permanent childhood hearing impairment. *Pediatrics* 2006; 117(4): 1101-1112.
7. Health Professions Council of South Africa. Professional Board for Speech, Language and Hearing Profession: Early Hearing Detection and Intervention Programmes in South Africa, Position Statement Year 2007. <http://www.hpcs.co.za/hpcs/default.aspx?id=137> (accessed 17 October 2008).
8. Olusanya BO, Wirz SL, Luxon LM. Community-based infant hearing screening for early detection of permanent hearing loss in Lagos, Nigeria: a cross-sectional study. *Bull World Health Organ* 2008; 86: 956-963.