BEST PRACTICE GUIDELINES FOR NEWBORN AND INFANT HEARING SCREENING IN SOUTH AFRICA

Introduction
This document gives an outline of best practice guidelines for newborn and infant hearing screening within the South African context. A practical approach is followed, and the recent Hearing Screening Position Statement of the Health Professions Council of South Africa (HPCSA, 2007) is the used as the definitive document for these guidelines.

Principles of Newborn and Infant Hearing Screening
- Universal newborn hearing screening (UNHS) is essential, in contrast to previous recommendations of risk-based screening in contexts with limited resources, in order to ensure that all infants have access to early identification and intervention services (HPCSA, 2007:12).
- Hearing loss should be identified by 3 months of age and no later than 4 months of age for infants enrolled in clinic-based screening programs (HPCSA, 2007:10). Early intervention services should commence by 6 months of age and no later than 8 months of age for infants enrolled in clinic-based screening programs (HPCSA, 2007:10).
- All infants who pass the hearing screening but demonstrate risk factors for progressive or late-onset hearing loss should receive ongoing monitoring either by empower caregivers to monitor auditory milestones or to schedule a follow-up screening in 6 – 12 months depending on the type of risk factor and the resources available for continued surveillance (HPCSA, 2007:10). Risk factors for progressive or late-onset hearing loss can be found in the Hearing Screening Position Statement (HPCSA, 2007:27-30).
- Infants identified with a hearing loss should be enrolled in early intervention programs as soon as possible and should be fitted with amplification within one month after diagnosis of the hearing loss (HPCSA, 2007:25).
Target disorder for newborn and infant hearing screening
The targeted hearing loss is a permanent bilateral hearing loss of at least 40 dB averaged over the frequencies 0.5, 1, 2 & 4 KHz (HPCSA, 2007:10). A bilateral hearing loss is selected as the target disorder to be screened for in South Africa, owing to limited financial and human resources. A unilateral refer result does however, qualify as a risk indicator for progressive or late-onset hearing loss, and these infants should receive continued surveillance (HPCSA, 2007:10, 30).

Platforms for newborn and infant hearing screening
Platforms for newborn and infant hearing screening in South Africa include three contexts, namely: well-baby nurseries, neonatal intensive care units (NICUs), and 6-week immunization visits at primary health care clinics (HPCSA, 2007:13). Screening in these three contexts should serve to achieve the best coverage rates of all South African infants.

Technology for newborn and infant hearing screening
Only physiologic measures for hearing screening should be used. These physiological screening technologies include otoacoustic emissions (OAEs), including distortion product OAEs and transient evoked OAEs, as well as automated auditory brainstem response technology (AABR). Noise-emitting devices, such as rattles and whistles are not endorsed for newborn hearing screening (HPCSA, 2007:14).

AABR is the screening technology of choice for NICU infants, as they have an increased prevalence of auditory neuropathy, which can only be identified by a neural based test, such as auditory brainstem response testing (HPCSA, 2007:14). OAE screening is recommended for newborns from well-baby nurseries, as well as infants at immunization visits. OAE screening is the choice of technology to be used at immunization visits, as older infants are more restless and irritable than newborns. High frequency (1000 Hz) tympanometry should be used to differentiate aetiology of OAE refer results (HPCSA, 2007:15).
Follow-up of newborns and infants who do not pass the hearing screening

Timely follow-up of newborns and infants who do not pass the initial or subsequent hearing screenings is vital in order to ensure the success of newborn and infant hearing screening programs. Follow-up is highly dependant on caregiver awareness regarding the importance of timely follow-up, the benefits of early identification of and intervention for hearing loss, as well as the effects of late identified hearing loss (HPCSA, 2007:16). Every effort should thus be made to increase caregiver awareness in order to facilitate the success of newborn and infant hearing screening programs. It is the responsibility of the audiologist in charge of the newborn and infant hearing screening program to ensure that demographic information, addresses, and contact details are available and correct for all infants and their caregivers, in order to be able to contact caregivers for follow-up appointments (HPCSA, 2007:18).

Recommended test batteries for the diagnosis of hearing loss

A test battery for infants younger than 6 months should include the following:

- Family history
- ABR and/or ASSR
- Diagnostic OAEs
- Assessment of middle ear functioning using 1000 Hz tympanometry
- Acoustic reflex thresholds
- Observation of behavioural response to sound
- Parental report of emerging communication and auditory behaviours
- Children should be referred for a medical or otologic evaluation where necessary
(HPCSA, 2007:19).

A test battery for infants aged 6 to 36 months should include the following:

- Child and family history
- Behavioural response audiometry, comprising either visual response audiometry or conditioned play audiometry, depending on the child’s age
- Speech detection and recognition testing
- Parental report of auditory and visual behaviour
- Screening of communication and language milestones
- OAE, ABR and ASSR should also be conducted at least on the initial evaluation
- Children should be referred for a medical or otologic evaluation where necessary (HPCSA, 2007:20).

**Enrollment in early intervention programs**

Newborns and infants with a confirmed hearing loss should be enrolled in early intervention programs as soon as possible. Early intervention programs should provide audiologic habilitation, medical and surgical intervention, as well as communication assessment and intervention (HPCSA, 2007:24-25). Infants should be fitted with amplification within one month of confirmation of hearing loss, and early intervention services should commence accordingly. Furthermore, infants with confirmed hearing loss should receive ongoing audiologic monitoring at interval not exceeding 3 months as part of their early intervention programs (HPCSA, 2007:25).

**Benchmarks and quality indicators for newborn and infant hearing screening programs**

The following benchmarks and quality indicators have been set by the HPCSA (2007:17-18) in order to ensure the effectiveness and efficiency of hearing screening programs:

- Within 6 months of program initiation a 95% coverage rate of newborns and infants should be reached.
- Within one year of program initiation a referral rate of less than 5% should be achieved.
The audiologist in charge of the hearing screening program should document efforts to follow-up on a minimum of 95% of infants who refer their initial hearing screening. Telephonic contact with caregivers is recommended where possible, instead of written contact, in order to ensure more effective and timely follow-up.

- A 70% or greater follow-up return rate of infants and their caregivers is ideal.

**Interdisciplinary Team Approach**

Newborn and infant hearing screening should be family centered and an interdisciplinary team approach should be followed. Essential team members for newborn and infant hearing screening are: families; Audiologists; Speech-language therapists; Nurses; Paediatricians; Ear-, Nose-, and Throat-Specialists; and community workers (HPCSA, 2007:7). Active collaboration between various professionals and team members is essential in order to ensure that infants receive quality service delivery in terms of effective hearing screening, timely follow-up and management of auditory disorders.

**Reference**