

**WEBAPPENDIX I** DETAILS OF SCREENING TESTS

The two available techniques are Otoacoustic emissions (OAE) and Auditory Brain-stem response (ABR).

*Otoacoustic emissions (OAE):* Probe is kept in the ear and the machine is switched 'on' when click sounds are produced. Sound waves travel from the external ear to the inner ear and causes outer hair cells of the cochlea to move, producing sound detected by the machine probe at the external ear canal. This indicates that the baby has a normal cochlear (inner ear) function.

*Cost of instrument:* OAE Screener Otoportlite (Otodynamics, UK) cost INR 2.95 lakh + 5% Tax; can be purchased locally.

*Purchase and maintenance:* Of the four basic parts of the OAE instrument (main body, probe, probe tips and couplers), it is the couplers which require replacement most often, when the debris in the ear canal or wax obstructs it. Couplers cost around INR 500. Probe tips may require frequent changes, cost INR 50. Main instrument and probe last long enough for two to three years. In addition, the batteries need to be replaced.

OAE may be affected by debris or fluid in the external and middle ear, decreased tympanic mobility, delayed cochlear maturation - resulting in referral rates of 5% to 20% when screening is performed in the first 24 hours after birth. Hence, OAE should be done on the day of discharge or 72 hours after birth. Referral rates <3% may be achieved when screening is performed during first 48 hours after birth. In a two step system using OAE as the first step, referral rates of 5% to 20% for repeat screening with ABR or OAE may be expected.

Due to automated OAEs, screening can be conducted by anyone after baseline training. However, the person should be educated till graduate level or preferably from medical field, so he/she can communicate results to caregivers.

*Auditory Brainstem Response (ABR):* ABR is an electro-physiologic measurement that is used to assess auditory function from the eighth nerve through the auditory brainstem; via placing disposable surface electrodes high on the forehead, mastoid and the nape of the neck.