

Hearing impairment: overview and diagnosis

This is a transcript of the Raising Children Network video available at http://raisingchildren.net.au/articles/hearing_impairment_overview_video.html. Child health specialists talk about different types of hearing impairment. Parents of children with hearing impairment and specialists talk about some of the signs that a child has a hearing impairment.

Professor Greg Leigh [*Director of the Renwick Centre, Royal Institute for Deaf and Blind Children*]: Hearing impairment is one of a range of terms that get used to explain what could be anything from a partial, right through to a total loss of the ability to hear – the ability to detect sounds and make meaning of those sounds. We're particularly fortunate in Australia: we are now in a situation where more than 96 per cent of all children born in Australia will have their hearing screened at or very soon after birth. In most states in Australia that screen is conducted using something called the auditory brain stem response, which is effectively a signal sent from the brain, or that can be detected from the brain, that indicates that an auditory stimulus has been received, that something has been heard. The process of what's called universal newborn hearing screening has been progressively rolled out since 2002, first in New South Wales, and then across the rest of the country.

Sandra [*Mother of three, one with hearing impairment*]: Hi, I'm Sandra, a mother of three kids. They're six, four-and-a-half, and one-and-a-half. My eldest is six, and he has a moderate to severe sensorineural hearing loss. When Lachlan was born, there weren't any newborn screenings at the particular private hospital we were at, so we didn't know.

Greg: So we now know that just over one out of every thousand children born in Australia will have a significant hearing loss, at birth. What we also know, though, is that by the time children are of approximate school age, that figure has risen. So there's an important message here: screening children at birth does not guarantee that a child will not acquire a hearing loss at a later time, or that that hearing loss may not become evident at a later time. So there are some things that we want to ensure that we continue to look for, in the development of children, to make sure that we are alert to the possibility of a hearing impairment at a later stage. For very young children, from birth to, say, six months of age, we'd be looking for children to startle when there's a loud sound, or to wake when there are loud sounds around them, turning to a familiar sound source or increasingly recognising or calming to particular voices, so not just any voice.

At nine months of age, we expect to see children start to use what we might call babble – making lots of noises. And noises that increasingly start to sound like speech noises: the 'bub-bub-bub' and the 'mum-mum-mum' that we hear children produce. These are really clear indications of response to sounds that children have heard.

Sandra: A lot of the time with him, it would be the second or the third time that you said it, that he would respond. My other friends' kids were following instructions, so by 18 months you could say 'Go and put your nappy in the bin' or 'bring me the cup' or 'bring me the blue teddy'. All my friends' kids were doing that, and he was not doing it at all.

Greg: If for any reason you're not seeing those hallmarks of early listening behaviour, or you're worried about it for whatever reason, then speak to a maternal and child health nurse, speak to your GP, with the aim of having your child's hearing assessed by a qualified audiologist.

Sandra: We went to Australian Hearing in the city and I was like 'Ohhh, you know what? This child doesn't have hearing loss, we're just going because we have to do this in order to get him into speech therapy. And we went there and the audiologist was behind a glass wall and they had the puppets, and they were going to make some super loud sounds – we knew he could hear loud sounds - and they taught him once the sound went, to turn and a little puppet would dance. And he was sitting in the room at a little table with the audiologist opposite him, and some puzzles to keep him interested, but not engrossed, and I sat out of his line of vision. And then as the sounds got a little bit softer – not too discernibly softer to the adults around, but softer – it was then really very obvious that Lachlan wasn't able to hear. He was very busy playing with his puzzles. These loud sounds just went all around the room and I was just with tears pouring down my face, just willing him to hear the sounds. But there was no response.

Michelle Disbery [*Head of Early Childhood Services, Royal Institute for Deaf and Blind Children*]: We certainly do get a number of children come to us with a late diagnosis. They've been diagnosed with a hearing loss a little bit later on in their life, so maybe three years and older. Predominantly we get families coming through the SWISH program, which is the state-wide infant hearing screening program, but we certainly get some older children who are coming through with a late diagnosis.

Greg: In terms of types of hearing loss, there are two main categories of hearing loss. We talk about conductive hearing loss and sensorineural hearing loss. Conductive hearing losses, or conductive impairments, really relate to anything that stops the travelling of sound from the environment, through the ear, to the sensory processors of the ear. Sounds will be softer, but typically not distorted. Almost all conductive hearing losses are able to be treated, able to be reversed, almost completely – whether that's through something as simple as removing the wax or the foreign body, or a surgical intervention to correct the problem with the ear canal. Or in the most common case of conductive hearing loss – middle ear infections – undertaking the necessary medical interventions to ensure that the infection is cleared up and that problem in conducting sound is removed.

The other type of hearing loss relates to the inner ear, which is really the sensory process of hearing. It relates to the sensation of hearing, in the inner ear – the cochlear – or the transmission of that beyond the cochlear, via the nerves.

Sandra: They've got these little hairs inside the inner ear, a little bit like the nerve endings in your skin that tell you when someone's touching you. When these little hairs move, they tell the brain that there is sound. So either a person can have only a few hairs, or those hairs can be damaged, or the amount of space they have – the actual cochlear – might be formed a little bit differently. And that can produce a problem at

that level. Other people with auditory neuropathy – which is not Lachlan’s thing – they can have a problem with the messages as they go along the nerve, after the hair cells are fired.

Greg: The other aspect of sensorineural hearing loss is that it’s not always, but almost always, permanent. And a child with sensorineural hearing loss will almost certainly need the assistance of hearing aids or perhaps cochlear implants as a strategy for improving the quality and the volume of sound that they have access to.

Michelle: In the first instance, families are often really keen to know what the hearing impairment means for their child: what exactly they can hear, and what they can hear with their amplification – if they have a hearing aid or a cochlear implant. And they often want to know what the outcome is going to be, which is really difficult to predict, because every child is an individual.
