SUBMISSION TO THE AUSTRALIAN SENATE INQUIRY INTO HEARING HEALTH IN AUSTRALIA

October 2009

Background

Aussie Deaf Kids welcomes the opportunity to make a submission to this Senate Inquiry into Hearing Health in Australia. Aussie Deaf Kids is a not-for-profit organisation providing online information and support to families raising a deaf child in Australia.

In this submission, we would like to highlight the issue of children with a unilateral hearing loss. These children have normal hearing in one ear and a degree of hearing loss in the worse ear. The submission is informed by the experiences and expressed needs of parents with a child diagnosed with a unilateral hearing loss that participate in our online parent support group.

At the heart of our submission is the concern that while children with a unilateral hearing loss are being identified through newborn hearing screening programs, they are not receiving the same access to services and technology as children diagnosed with a bilateral loss. If children are being diagnosed with a unilateral hearing loss through newborn hearing screening, then we feel they too deserve to benefit from the promise of improved speech, language and educational outcomes.

> "…in the past, physicians have historically taught that one ear is "good enough" and many do not recommend treatment for single sided deafness. These physicians, who are poorly informed about the current research, do not perceive a problem in delaying treatment of single sided hearing loss during the critical period of the auditory system during the first few years of life. Unfortunately, this delay can create permanent and irreparable harm to the child whose hearing goes untreated." Dr Joseph Roberson, Otolaryngologist at the California Ear Institute.

Prevalence of unilateral hearing loss

Approximately 1 per 1,000 babies born in Australia will be diagnosed with a permanent bilateral hearing loss. A similar number will be diagnosed with a unilateral hearing loss.

There is an increasing prevalence of hearing loss with age of the child although the prevalence of unilateral hearing loss in Australian school children is unknown. Australian Hearing reports, "In Australia, between 9 and 12 children per 10,000 live births will be born with a moderate or greater hearing loss in both ears and around a further 23 children per 10,000 will acquire a hearing impairment that requires hearing aids by the age of 17 through accident, illness or other causes." [1] Around 20 percent of children who were initially diagnosed with a unilateral hearing loss will subsequently lose the hearing in their other ear.

Causes of unilateral hearing loss

Children with a unilateral hearing loss have normal hearing in one ear and a degree of hearing loss in the other ear. This can range from a mild to a profound hearing loss. A profound or total hearing loss in one ear is also referred to as single-sided deafness.

The child may have a conductive hearing loss, which may be reversible or a sensorineural hearing loss, which is permanent.

The three most common causes of conductive unilateral hearing loss are:

1. **Otitis media** – a middle ear infection which is usually treatable and temporary. Otitis media is particularly prevalent in Aboriginal and Torres Strait Islander populations where the disease is likely to become chronic and respond poorly to treatment.
2. **Cholesteatoma** is slow growing, non-malignant growth behind the ear drum which can result in serious damage to the middle and inner ear. It is normally the result of severe and repeated middle ear infections.
3. **Microtia and aural atresia** - A congenital deformity of the outer ear and the absence of an ear canal. Microtia and atresia has a reported incidence of approximately 1 in every 6,000 births worldwide. In the majority of cases,

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1. *Hearing loss in Australia - it's more common than you think*. Australian Hearing. Retrieved 2/10/2009 from http://www.hearing.com.au/upload/media-room/Hearing-loss-in-Australia.pdf

microtia is also associated with aural atresia or stenosis and these children will have a conductive hearing loss.

Sensorineural hearing loss is permanent and the causes may be genetic or non-genetic such as infections. For a large percentage, there is no known cause for the child's hearing loss.

What is the impact of unilateral hearing loss?

The two most significant issues for children with a unilateral hearing loss are:

1. **Sound localisation** – these children cannot identify where sound is coming from. This has serious safety implications.
2. **Hearing in noise** – the greater the hearing loss and the more difficult the listening situation, the more dysfunctional unilateral hearing loss becomes. The implications of this are most detrimental in a noisy classroom.

Prior to the introduction of newborn hearing screening, most children with a unilateral hearing loss were identified at five or six years of age upon entry into school. Approximately 37 percent of these children failed a year at school and an additional 13 percent required some academic assistance at school. Children with a severe or profound unilateral hearing loss were at a higher risk of academic difficulty. [2]

The picture for babies identified with a unilateral hearing loss through a newborn hearing screening program is not yet clear and researchers are striving to identify the characteristics of the children with a unilateral hearing loss who are most at risk of developing academic and behavioural problems. [3,4] What is evident, however, is that "a hearing loss of any degree appears sufficient to interrupt the normal continuum of communication development and academic skills." [3]

In Australia, a "wait and see" approach is generally applied for children with a unilateral hearing loss. This is very difficult for families. They see this as a "failure

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[2] Tharpe, A.M. (2007). *Assessment and management of minimal, mild and unilateral hearing loss in children.* Retrieved 2/10/2009 from http://www.audiologyonline.com/articles/pf_article_detail.asp?article_id=1889

[3] Yoshinago-Itano, C., DeConde Johnson, C., Carpenter, K. & Stredler Brown, A. (2008) Outcomes of children with mild bilateral hearing loss and unilateral hearing loss. *Seminars in Hearing*, 29, 196-211.

[4] Tharpe, A.M., Sladen, D.P., Dodd-Murphy, J. & Boney, S.J. (2009). Minimal hearing loss in children: Minimal is not inconsequential. *Seminars in Hearing*, 30, 080-093.

model" - the child receives intervention only when their speech or language development is delayed or they experience academic and/or behavioural difficulties.

While children with a unilateral hearing loss are being identified through newborn hearing screening programs, they too need to benefit from the promise of improved speech, language and educational outcomes. Parents want to be proactive in ensuring their child has the same access to communication and education as their hearing peers. They want their children to have the best access to sound from as early as possible, particularly in the early formative years. Parents want to ensure that their child is able to achieve their potential despite their unilateral hearing loss.

Access to hearing services and technologies

In Australia, the services a child with a unilateral hearing loss receives varies from state to state and ranges from no funding for services to similar access to services as children with a bilateral hearing loss.

From a parent perspective, there are two issues here.

1. **Equal access to services for their children from the time of diagnosis.**
   When a child is diagnosed with a unilateral hearing loss, parents usually report only hearing, "Your child is deaf". They have the same grief reactions as parents whose child has a bilateral loss. This is often compounded by the "wait and see" approach.

   Parents are told that newborn hearing screening was introduced to improve speech, language and educational outcomes for children with a hearing loss. But their baby has been identified with a hearing loss and they are being told to wait and see how the baby progresses. In the words of one parent, 'We felt that when our baby first failed the [newborn hearing screening] test, it was really urgent to get tested and diagnosed straight away to get the best possible help for her. But once she was diagnosed everything has come to a standstill, waiting for her to get older to see what happens.'

   Parents fully support newborn hearing screening and appreciate knowing that their child has a hearing loss early but they then need guidance and support and access to services to ensure the best outcomes for their child.

   Access to early intervention services for babies with a unilateral hearing loss

varies considerably from state to state and between service providers. Some babies are able to access early intervention but this is not routine.

In addition, if the family opt for the "wait and see" approach, the baby becomes ineligible for services from Australian Hearing. This is a considerable concern to parents. Ongoing monitoring of the child's hearing is a fundamental aspect of their hearing health program. Private hearing centres are usually staffed by audiologists or audiometrists with little experience of congenital hearing loss, in general, and unilateral hearing loss in children, in particular. These babies need to be carefully monitored by paediatric audiologists to ensure quality ongoing monitoring and care. Australian Hearing is where families can be most confident they will receive this care.

One of the criteria for population screening as described in the "Population Based Screening Framework" is, "The treatment must be effective, available, easily accessible and acceptable to all patients with the recognised disease or condition."[5] These babies are being diagnosed through newborn hearing screening but the management of their hearing loss is not optimal.

2. **Technology solutions for children with a unilateral hearing loss**
   Children with a unilateral hearing loss are eligible for hearing services through Australian Hearing if they choose to use a hearing aid.

   - ***Personal amplification***
     Current knowledge of the plasticity of the young brain provides compelling evidence for early amplification during the critical period of the development of the auditory system in children.

     Hearing aids
     Babies and children with a unilateral hearing loss are offered hearing aids from Australian Hearing. However, hearing aids are only suitable for children with a mild to severe hearing loss. They are not suitable for children with a profound sensorineural hearing loss and may not be suitable for children with some forms of conductive hearing loss such as aural atresia.

     Bone conduction hearing aid
     Currently the only option available to children with a profound unilateral hearing loss (single-sided deafness) or microtia and atresia from Australian

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5 Australia. Department of Health. (2008). *Population Based Screening Framework.* Canberra, Australia.

Hearing are traditional Bone Conduction Hearing Aids. A bone conduction hearing aid transmits sound through the skull to the cochlea, bypassing the outer and middle ears. A bone conduction hearing aids consists of a hearing aid and a vibrator which are both attached to a headband (Fig. 1). The vibrator needs to be firm on the head which can be uncomfortable and give the wearer headaches and sore skin. Some parents attach the vibrator and hearing aid to handmade headbands to reduce the discomfort but this is does not usually provide satisfactory hearing results and will often not stay in place. A bone conduction hearing aid is not a successful appliance with children.

Bone anchored hearing aid

A product developed by Cochlear Ltd has come on the market which is providing significantly improved hearing results for people with single-sided deafness and atresia. This is a bone anchored hearing aid (Baha) (Fig. 2) . A softband version (Fig. 3) is available for babies and young children as their skull bones are too thin for the implanted device. This option is, however, not available to children through Australian Hearing.

The softband device is marketed mainly as a non-surgical way to trial the Baha prior to getting the implanted version. The softband device is the best option available for babies and young children prior to the age of 5 (when implantation is possible) whose only option at aiding is through bone conduction.

Currently only the implanted device is covered under private health insurance. The softband version has no private health rebate, and at over $6,000, is out of the reach of most families. To have this technology available but not accessible is very frustrating and disheartening to families.

Transear bone conduction hearing aid

A second option used by children with single-sided deafness in the US and UK is the Transear (Fig. 4) which looks like a conventional BTE (Behind the Ear) hearing aid but transmits the sound to the better ear using bone conduction. The oscillator is embedded in a custom made shell which fits into the ear canal. This hearing aid has not been approved for use in Australia.

- ***Assistive listening devices for the classroom***

One of the biggest issues for children with a unilateral hearing loss is the noisy classroom environment. Three aspects of the noisy classroom affect the ability of the child with a unilateral hearing loss to hear and comprehend in the

classroom – background noise, the distance of the teacher and the reverberation within the classroom. While the child may 'hear' the teacher, they will experience difficulty understanding what is being said.

A Sound Field Amplification System provides a solution to all three problems in the noisy classroom. A sound field amplification system "operates on the principle of improving speech intelligibility through the use of a shorter, direct sound path from speaker to ear, resulting in an even distribution of sound throughout the room and improving communication by reducing the effects of reverberation." [6]

Sound field amplification systems consist of an audio amplifier, a microphone for the primary speaker, and no less than four speakers mounted between 2m and 3 m about the floor level. Speech is amplified 10-12dB above room noise through the speakers placed around the room. The cost for a sound field system is around $3,000 plus installation.

"Research has shown that these systems benefit people with mild hearing loss, with and without hearing aids, as well as those with fluctuating and/or conductive hearing loss, and people with normal hearing."[6] Despite the proven efficacy of sound field systems in classrooms for children with a unilateral hearing loss, there is limited funding available for sound field systems in classrooms.

Aussie Deaf Kids' recommendations for the Federal Government

Recommendation 1
Children with a unilateral hearing loss and their families have the same access to services following diagnosis as children with a bilateral hearing loss. This includes :

- access to early intervention services
- ongoing follow up with Australian Hearing even if they do not use a hearing aid
- access to support services at school.

Recommendation 2
Children with single-sided deafness or atresia have access to fully funded Softband Baha and/or Baha implant.

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[6] Draft AS 1428.5 - Standards Australia - Access for People with Disabilities - Design for communication - Hearing augmentation (2009).

Recommendation 3
An investigation into the efficacy of the Transear for children with single-sided deafness.

Recommendation 4
Primary schools are provided with funding to install sound field amplification systems in classrooms with children with unilateral hearing loss.

Aussie Deaf Kids would be pleased to provide further details or explain aspects of this submission to the Senate Inquiry.

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Appendix

Figure 1: Bone conduction hearing aid
(Source: http://www.clivir.com/pictures/hearing_aid/boneconduct.jpg)

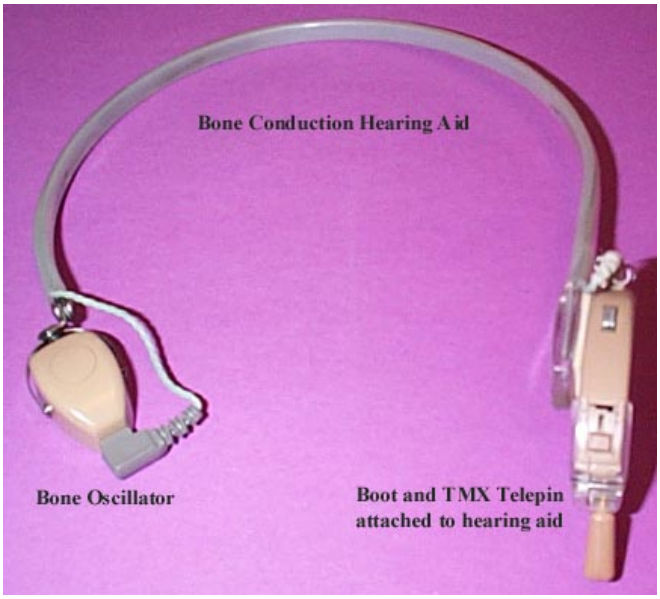

Figure 3: Bone anchored hearing aid (Baha)
(Source: http://www.audiologyonline.com/management/uploads/articles/1baha12003.jpg)

Figure 2: Softband Baha
(Source:
http://www.hearingexchange.com/blogs/wp-content/uploads/2008/01/baha-photo.JPG)

Figure 4: Transear
(Source:
http://www.audiologyonline.com/management/uploads/articles/valente_SSD_fig10.gif)