

Early Intervention For Hearing Impairment: Appropriate, Accessible and Affordable

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Abstract

Before the onset of universal newborn hearing screening, children with hearing loss are not identified until they fail to meet important speech and language milestones at 2 years old and beyond. With the current widespread implementation of universal newborn hearing screening programmes, more infants with hearing loss can now be identified in the first few weeks of life and be fitted with amplification within the first few months. This presentation aims to discuss the adverse effects of hearing loss in a child's development. More importantly, it will highlight the value of early identification and early intervention and how these can maximise a child's healthy development of speech, language, academic, emotional and psychosocial skills, thereby facilitating his/her successful integration into mainstream society. In Singapore, universal newborn hearing screening is in place in major hospitals and polyclinics with childbirth services, making it accessible to all families with newborn babies. There are also a number of early intervention programmes that provide rehabilitation services focusing on the development of communication skills of children with hearing impairment. With the availability of services and abundant government support, any child with hearing loss should be identified as soon as possible and provided with early, appropriate intervention. A hearing impairment is said to be an "invisible disability," yet it is the most common major birth defect. In Singapore, one in 1000 babies are born with severe to profound hearing loss and about 5 in 1000 with lesser degrees of hearing loss. Several surveys indicate that between 1 and 3 percent of all children suffer from hearing loss.

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The Importance of Early Detection and Intervention

Universal newborn hearing screening (UNHS) is defined as the use of an objective measurement of the auditory system to identify infants at risk for hearing loss. Before the advent of UNHS programmes, children with hearing loss were not identified until they failed to meet important speech and language milestones after 2 years of age, with many children who were deaf or hard of hearing not being identified until they entered school at 5 or 6 years old. Studies have demonstrated that when hearing loss of any degree including mild bilateral or unilateral hearing loss is not adequately diagnosed and addressed, the hearing loss can adversely affect the speech, language, academic, emotional and psychosocial development of young children.

But when early identification and intervention occur, hearing-impaired children make dramatic progress, are more successful in school and become more productive members of society. The earlier intervention and rehabilitation begin, the more dramatic the benefits.¹ According to Flexer, early identification and intervention

is critical because the neuroplasticity of the brain is greatest in the first three and half years of life and so the younger the infant, the greater the neuroplasticity.² Rapid infant growth requires prompt intervention, typically including amplification or cochlear implants, and a programme to promote auditory skill development. The child is able to develop his/her auditory, speech and language skills during the linguistically formative years along with his/her normally hearing peers. Therefore, the identification of newborn hearing loss should be considered a neurodevelopmental emergency.

Impact of Early Intervention

In a study by Yoshinaga-Itano, children whose hearing loss were identified by 6 months of age and who received intervention shortly after were found to have better language quotients than those whose hearing losses were identified after 6 months of age.³ In another study, it was found that early identification of hearing loss is not only related to better language development, but also related to better personal-social development, better self-description and

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self evaluation.⁴ Better language development is also related to higher mastery and motivation of the child.

The developmental outcomes of children with hearing loss born in Colorado hospitals with and without UNHS programme were compared by Yoshinaga-Itano et al and they found out that children in the screened group had better receptive and expressive language quotients, more different consonants in the spontaneous phonetic repertoire, better speech intelligibility, and larger expressive vocabulary inventories.⁵ These findings are encouraging and suggest that early identification and subsequent intervention is associated with improved language development in deaf and hard of hearing children. Hence, best standard practice dictates that all infants with hearing loss be identified by 3 months of age and receive early intervention by 6 months. UNHS would be an excellent vehicle for attaining this goal.

Early Hearing Detection and Intervention In Singapore

The birthing facility is the most efficient and cost-effective environment for newborn hearing screening. The infant is readily available and qualified personnel are available to provide screening. The purpose of UNHS is to provide early hearing detection and intervention to infants in an attempt to minimise speech and language delays. This is the first in the early hearing detection and intervention process; other important steps are audiological evaluation to confirm hearing loss and early intervention services.

In Singapore, UNHS has been established in all hospitals with delivery facilities for the past few years. Data gathered from the Singapore General Hospital, National University Hospital and KK Women's and Children's Hospital for the period 1 April 2002 to 31 March 2004 gave an overall prevalence of 4 in 1000 babies having hearing loss, with 64 being severe or profound. The median age of diagnosis was 2.7 months.⁶

Intervention Services in Singapore

There are a number of early intervention services in Singapore which accommodate infants and very young children with newly diagnosed hearing loss. These services offer 3 different types of communication approaches.

1. Auditory-Verbal Therapy (AVT)

Auditory-Verbal Therapy is an approach that utilises special techniques and strategies to enable children with hearing impairment to develop spoken language primarily through listening. With an emphasis on early detection of hearing loss, early fitting of hearing aids or cochlear implants, ongoing diagnostic therapy and a partnership between the family and professionals, AVT can provide opportunities for any children with hearing loss to process spoken language and to talk. The goal is for the child to function independently in as normal a learning environment as possible. Mainstream schools are usually recommended

for the hearing-impaired child's education and socialisation.

2. Natural Auditory Oral (NAO) Approach

The NAO follows the pattern of language learning of children with normal hearing and lays heavy emphasis on the development of a child's listening skills through appropriate amplification. This results in talking children who become linguistically independent adults.

3. Total Communication (TC) Approach

The TC approach is a philosophy involving the collaboration of oral, manual and auditory modes of communication which include speech, speech reading, sign system, gestures, reading, writing, visual symbols and effective use of residual hearing.

Although these are different communication approaches, all have the same goal of maximising a child's hearing potential, developing communication skills, and integrating him/her successfully into the mainstream as a productive member of society.

Affordability of Early Hearing and Detection and Intervention

A nominal fee is charged for every UNHS test. For early intervention programmes, subsidies are available in government as well as non-government institutions and voluntary welfare organisations. Whatever amount is spent for the early detection and intervention of children with hearing loss is a small price to pay compared to the costs to parents, guardians, school systems and society for those children who go undiagnosed and untreated who often leave school with language levels too low to fare well in society. Because of this, many cannot find employment and end up receiving disability support.⁷

REFERENCES

1. Looking to the future: Commission on Education of the Deaf recommendations. *Am Ann Deaf* 1988;133:79-84.
2. Flexer, Carol. Auditory brain development: a paradigm shift for children who are deaf or hard of hearing. Presented at the Australasian Conference on Listening and Spoken Language, Brisbane, Australia, 2007.
3. Yoshinaga-Itano C, Sedey AL, Coulter DK, Mehl AL. Language development of early-and-later-identified children with hearing loss. *Pediatrics* 1998;102:1161-71.
4. Yoshinaga-Itano C. The social-emotional ramifications of universal newborn hearing screening, early identification and intervention of children who are deaf or hard of hearing. *Proceedings of the 2nd International Pediatric Audiology Amplification Conference*. Chicago, Illinois, 2001.
5. Yoshinaga-Itano C, Coulter D, Thomson V. Developmental outcomes of children with hearing loss born in Colorado hospitals with and without universal newborn hearing screening programs. *Semin Neonatol* 2001;6:521-9.
6. Low WK, Pang KY, Ho LY, Lim SB, Joseph R. Universal newborn hearing screening in Singapore: the need, implementation, and challenges. *Ann Acad Med Singapore* 2005;34:301-6.
7. Yoshinaga-Itano C. Critical stage in infant development identified for language acquisition. Available at: <http://www.colorado.edu/news/releases/2000/76.html>. Accessed 10 December 2008.