

**SPEECH PERCEPTION IN IMPLANTED CHILDREN:  
EFFECTS OF PREOPERATIVE RESIDUAL HEARING AND  
SPEECH PROCESSING STRATEGY**

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Since the first child was implanted with the Nucleus 22-channel cochlear prosthesis in Melbourne in 1985, the number of implanted children world-wide has rapidly expanded. Over this period, more effective paediatric assessment and management procedures have developed, allowing cochlear implants to be offered to children under the age of 2 years. In addition, a succession of improved speech processing strategies have been implemented in the Nucleus implant system, resulting in increased mean speech perception benefits for implanted adults. Research in the Melbourne and Sydney Cochlear Implant Clinics has also demonstrated that young children can adapt to and benefit from improved speech processing strategies such as the Speak strategy. Reported speech perception results for implanted children show that a considerable proportion (60%) of paediatric patients in the Melbourne and Sydney clinics are able to understand some open-set speech using electrical stimulation alone. These results, and the upward trend of speech perception benefits to improve over time with advances in speech processing, have raised questions as to whether severely, or severely-to-profoundly deaf children currently using hearing aids would in fact benefit more from a cochlear implant. To investigate the potential effect of the level of preoperative residual hearing on postoperative speech perception, results for all implanted children in the Melbourne and Sydney cochlear implant programs were analysed. Results showed that as a group, children with higher levels of preoperative residual hearing were consistently more likely to achieve open-set speech perception benefits. Potential factors in this finding could be higher levels of ganglion cell survival or greater patterning of the auditory pathways using conventional hearing aids prior to implantation. Conversely, children with the least preoperative residual hearing were less predictable, with some children achieving open-set perception, and others showing more limited closed-set benefits to perception. For these children, it is likely that preoperative residual hearing is of less significance than other factors in outcomes.



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