

Predicting speech perception outcomes for children using multichannel cochlear implants

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The ability to predict outcomes for children who are cochlear implant candidates is most helpful in counselling families and making clinical recommendations. Open-set speech perception results have been collected for all children implanted with the Nucleus device in Melbourne. Speech perception was assessed at six month intervals following implantation. Information was collected for each child regarding type of hearing loss, duration and age at onset of profound hearing loss, age at implantation, pre and post-implant communication mode, developmental delay, speech coding scheme and implant experience. These factors were used as predictor variables in step-wise multiple linear regression analyses with the speech perception scores as the dependent variables. A shorter duration of profound hearing loss, later onset of profound hearing loss, use of exclusively oral communication mode following implantation, and longer implant experience were associated with significantly ($p < 0.001$) better open-set speech perception. The SPEAK signal coding scheme was shown to provide superior speech perception performance for children ($p < 0.001$) to previous coding schemes.

Developmental delay was associated with poorer speech perception outcomes ($p < 0.01$). These variables accounted for over 50% of the variance in speech perception scores for this group.

The results suggest that younger implantation leads to improved outcomes for congenitally deaf children. On the other hand, the development of auditory language skills in implanted children may be more important than age at implantation in enhancing long term outcomes. Regression equations derived from these results can be used to predict outcomes for cochlear implant candidates with a reasonable accuracy.



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Title:

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[Abstract]

Date:

2002

Citation:

Dowell, R. C., Dettman, S. J., Williams, S., Hill, K., Tomov, A., & Clark, G. M. (2002).
Predicting speech perception outcomes for children using multichannel cochlear implants
[Abstract]. In Programme and Abstract Book: 6th European Symposium on Paediatric
Cochlear Implantation, Canary Islands, Spain.

Persistent Link:

<http://hdl.handle.net/11343/27091>

File Description:

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