

FACTORS AFFECTING SPEECH PERCEPTUAL PERFORMANCE FOR CHILDREN USING THE 22-ELECTRODE COCHLEAR PROSTHESIS.

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Speech perception results for all 40 children and adolescents implanted with the Nucleus 22 electrode cochlear prosthesis in Melbourne (as of February 1, 1992) were used to categorize performance for each child into one of six hierarchical groups:

- 1: detection of speech including high frequencies,
- 2: discrimination of suprasegmental features of speech in addition to 1,
- 3: discrimination and recognition of vowel sounds in addition to 1 and 2,
- 4: discrimination and recognition of consonant sounds in addition to 1, 2 and 3,
- 5: open set speech recognition with scores less than 20% for unfamiliar material in addition to 1 to 4,
- 6: open set speech recognition with scores greater than 20% for unfamiliar material in addition to 1 to 5, above.

All children demonstrated discrimination of suprasegmentals (level 2) and 58% demonstrated some open-set speech recognition (levels 5 and 6). The pattern of results suggested that children who can discriminate segmental features of speech tend to achieve open-set speech perception after adequate experience with the prosthesis.

The "performance level" , described above, was used as the dependent variable in a multiple regression analysis to assess the effect of various factors on speech perception performance. The duration of profound hearing impairment and the amount of experience with the prosthesis were shown to contribute significantly to the variance in performance level. A weaker trend was evident for recently implanted children which may suggest that those in oral/aural educational settings progress more rapidly, in terms of speech perception, than those in total communication settings. Age at implantation, cause of deafness, hearing levels prior to implantation, and number of electrodes in use, did not contribute significantly to the variance in speech perception performance for these children. The results showed that all children with less than seven years of profound hearing impairment and with over one year of experience with the prosthesis have achieved some open-set speech recognition. This is an encouraging result as the trend in clinical application of cochlear prostheses has been towards implanting younger children in recent years. If this sample of hearing-impaired children in Melbourne is representative of the general population, we may expect that most implanted young children will develop reasonable speech perception skills after adequate experience and training.



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