and a group of 20 normal controls, matched for age, sex, educational standard and handedness, in order to determine whether specific central auditory processing deficits are related to the presence of auditory hallucinations. The hallucinators as a group were shown to have essentially normal middle ear, cochlear, VIII nerve and brainstem function as evidenced by normal pure-tone thresholds, speech discrimination in quiet, tympanometry, stapedial reflexes, Rapidly Alternating Speech Perception, binaural fusion and Auditory Brainstem Response results. Staggered Spondaic Word and dichotic consonant-vowel testing revealed significant differences between hallucinators and controls, while Competing Environmental Sounds testing revealed no significant differences between groups. Significant differences emerged between hallucinators and controls for speech in the presence of ipsilateral competition. Tone frequency pattern sequences revealed deficits in verbal responses but not hummed responses in the hallucinator group. These results suggest specific abnormalities relate to verbal processing in hallucinators. A further comparison with a group of non-hallucinating psychotic patients is in progress to determine whether these findings are specific to hallucinations.

The Australia-Indonesia Collaborative Hearing Project in East Java

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Over the last two years Australian Hearing Services has led a number of collaborative projects in support of East Java's fledgling hearing services. These have been executed under the Australian-Indonesian Government's Memorandum of Understanding on Health and the Western Australia/East Java Sister State relationship. The aims of the project are to: evaluate local needs re training and equipment; assist by way of direct service delivery and training; and foster the self determination of local hearing services in East Java. Activities have included: "hands on" projects by an audiologist, technician and teacher of the deaf; numerous training sessions with parents, teachers, GP's, ENT's, hearing aid dispensers and allied professionals; ongoing consultation with key East Java officials; and assessment of Australian export potentials. These efforts recently culminated in the formation of the Province's first deafness foundation, under the patronage of the East Java Governor's wife Mrs Basofi Sudirman. Under this foundation, East Java has the potential to become Indonesia's premier region for provision of hearing services.

The Importance of Different Frequency Bands to the Speech Perception of Cochlear Implantees

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It is well known that cochlear implantees exhibit a wide range of speech perception ability. Understanding the reason for this variability may lead to improved speech processors. This study investigates whether implantees rely on different areas of the speech spectrum for speech cues, compared to normally hearing listeners, and whether poor performers rely on different spectral areas than better performers. Six subjects with the Mini System 22 implant and using the SPEAK strategy participated in this experiment. Scores for monosyllabic words were obtained using the full speech spectrum and with selected frequency bands removed from the subjects' speech processor maps. The Articulation Index (AI) is a measure of the proportion of speech information available to a listener, and the relative contribution to AI from
different frequency bands is termed the Importance Function. The five frequency bands studied in this experiment were determined to be of equal importance to normally hearing listeners for the speech material used. The scores for each implantee were transformed into AI values, and hence the relative importance of the bands was determined. This relative importance was compared between the implantee group and normally hearing listeners to determine the way in which speech perception by electrical stimulation varies from that by acoustical stimulation. Comparisons were also made between individual implantees to determine whether correlations exist between their speech perception ability and their use of cues in different parts of the spectrum. Further research will determine whether the differences among implantees are correlated with their ability to perceive changes in stimulation place or temporal characteristics.

Aided Speech Audiogram

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Information on hearing aid amplification provided to teachers of hearing impaired children needs to be clear and indicate what speech information is available to the child. Current reports based on the aided audiogram are sometimes misunderstood because of the way speech and aided thresholds are represented. Insertion gain measures cannot be easily adapted to the aided audiogram graph. This paper reports on a computer assisted procedure that refers all measures to ear canal SPL. The procedure was partly derived from an approach suggested by Seewald et al. (1991) but has significant differences, mainly concerned with reconciling narrow band with broad band information. The benefit of displaying information in this format was evaluated by a group of audiologists and teachers of hearing impaired children.

Multichannel Auditory Brainstem Implants: An Australian Case Study

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The multichannel Auditory Brainstem Implant (ABI) is an implantable device designed to restore a level of auditory perception in patients with bilateral acoustic neuromas, where the removal of the tumours is expected to result in a total loss of hearing. As with the cochlear implant, the ABI utilises an externally worn speech processor and headset, together with a surgically-placed receiver-stimulator and electrode array. The electrode array, developed through the collaboration of the House Ear Institute in the United States and Cochlear Corporation, consists of eight electrodes on a carrier, which is placed on the surface of the brainstem in the area of the cochlear nucleus. Placement of the electrode package is performed during the surgical procedure to remove the acoustic neuroma on one auditory nerve. The ABI functions in a manner similar to the cochlear implant, with speech information being processed by the speech processor, and passed by radio transmission to the implanted receiver-stimulator. The encoded speech information determines which of the
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