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

electrodes is critical, and intraoperative monitoring is an important feature of the surgical procedure. Results of speech perception assessments with adult patients in the United States have shown that the ABI can provide significant speech benefits. Results with the first Australian ABI patient are also encouraging, and will be presented in combination with the United States data.