

A "COMBIONIC AID" : COMBINED SPEECH PROCESSING FOR A COCHLEAR IMPLANT IN ONE EAR AND SPEECH PROCESSING HEARING AID IN THE OTHER EAR

G. Dooley, P. Blamey, P. Seligman, G. CLARK

Special Research Centre for Human Communication, Department of Otolaryngology, The University of Melbourne

Independent use of a cochlear implant in one ear and a hearing aid in the other is not acceptable for many implant users with some residual hearing. Psychophysical evidence suggests that there are substantial interaural interactions between acoustic and electrical signals including masking and loudness summation. These effects may contribute to the difficulty in using two independent devices and it is desirable to control the parameters of the electrical and acoustical signals far more accurately than is possible with two independent devices with separate microphones. In order to achieve this control we have developed a Combionic aid incorporating an implant and an 'implantcompatible' hearing aid controlled from the same speech processor. The new processor is particularly flexible and can implement a wide variety of speech processing strategies for combined acoustic and electrical stimulation. A benchtop prototype has been tested with five patients using a range of different speech tests. In general, patients do better when they use acoustic and electrical information simultaneously than they do with either alone. Some patients on some tests perform significantly better with the bimodal aid than they do with independent hearing aids and implant processors worn together. Wearable devices have now been built and evaluations of these devices are continuing.



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Author/s:

Dooley, Gary J.; Blamey, Peter J.; Seligman, Peter M.; Clark, Graeme M.

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