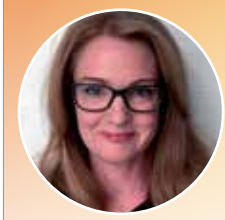
MEDICAL AUDIOLOGY SERVICES
IMPLANTS HEARING & BALANCE

COCHLEAR IMPLANT INNOVATIONS



Anne Gardner
Post Dip. Aud., B.Sc,

Andre Wedekind
M.Aud.,M.Clin.Aud., BHSc (Physio)

Dr Vesna Maric
AuD.,M.Aud.S.A.,M. Clin.Aud.,BSc.(Hons)

Cochlear implants (CI) have been at the edge of bionics innovation for 30 years, providing hearing to those with very severe hearing losses through direct stimulation of the auditory nerve. Here, we look at the latest developments in sound processing technology and implant design that continue to improve quality of life and communication for those with modern CI.

THE IMPLANT. Internal, implantable structures of a CI system are becoming smaller and, together with surgical advances, build on a trend towards atraumatic surgery and increasing hearing preservation. Cochlear implantation no longer means losing all natural hearing; for many, it simply replaces the speech frequencies for which hearing aids are no longer sufficient. This has lead to an unprecedented growth in candidacy. Recipients with a combination of natural and CI hearing show best performance in understanding speech in noise, music appreciation and sound localisation.

With more candidates, the known benefits of implantation from a young age and a growing likelihood for an MRI over a lifetime, MRI compatibility is of increasing importance. All the current models are compatible with a routine 1.5 Tesla MRI without the need for surgical magnet removal. In 2014, one company released a magnet that self-aligns within an MRI field, allowing safety up to 3 Tesla without the need for magnet removal.

THE SOUND PROCESSOR. Sound processing in the externally worn component has improved significantly as cochlear implant manufacturers merged with hearing aid manufactures and borrowed innovations for better speech-in-noise listening, automatic responding to changing environments and connectivity to wireless devices. In addition to connecting their CI processor to a smartphone, listeners can stream to a compatible hearing aid in the opposite ear at the same time, maximising the benefits of binaural hearing for a full range of multimedia.

Compared to other listeners, cochlear implant recipients still require significantly higher signal-to-noise ratios to achieve the same understanding. To improve comfort and performance in noise, processors automatically detect, analyse and reduce non-speech sounds like wind, traffic or clanging dishes. They combine multiple microphones and frequency analysis to zoom towards the dominant speech signal and away from potentially distracting speakers in a crowd.

51 COLIN STREET WEST PERTH WA 6005
P: 08 9321 7746 F: 08 9481 1917
W: www.medicalaudiology.com.au