

Delphi consensus on unilateral cochlear implantation in adults with bilateral severe, profound, or moderate sloping to profound sensorineural hearing loss



What is a Delphi consensus process?

A Delphi consensus is an established technique that allows for consensus to be reached by a group of experts by the collection and aggregation of their informed judgements. The process seeks to achieve consensus, using rounds of questionnaires to seek anonymous responses that are then aggregated and voted on. In clinical research, the key aim of a Delphi consensus is to achieve a set of statements that reflect current clinical expert thinking in the field. The consensus statements may also go further and make recommendations, for example, to improve the diagnosis or treatment of a specific condition or patient group.



Why is a Delphi consensus needed?

Hearing loss is one of the leading causes of disability worldwide.¹ Although hearing aids are effective for many individuals with hearing loss, those affected by bilateral severe, profound, or moderate sloping to profound sensorineural hearing loss (SNHL) may not receive benefits, or adequate benefit, from hearing aids. For these individuals, cochlear implants are a treatment option.

Many adults with hearing loss are not receiving cochlear implants even though they would benefit from them.² Conservative industry estimates suggest that no more than 1 in 20 adults who could benefit from a cochlear implant have one.^{3,4} Under-provision leads to a substantial unnecessary burden to the individual with hearing loss, leading to a poorer quality of life;³ it may also have economic and social consequences.⁵⁻⁷ There are many reasons contributing to this under-provision, including low awareness of the benefits of cochlear implants among healthcare professionals and individuals with SNHL, as well as a lack of specific referral pathways.³

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How was it done?

Systematic literature review

A systematic literature review was conducted to identify studies relevant to at least one of six key areas: i) level of awareness of cochlear implants; ii) best practice clinical pathway from diagnosis to surgery; iii) best practice guidelines for surgery; iv) best practice guidelines for rehabilitation; v) factors that impact cochlear implant performance and outcomes; and vi) cost implications of cochlear implants. Identified studies were manually checked against pre-specified eligibility criteria, and data relevant to the six areas of interest were extracted from the included studies. Studies were excluded for the following reasons: sample size less than 20, case studies or narrative reviews, studies published before 2005, pediatric studies, bilateral cochlear implants or electro-acoustic stimulation or hybrid hearing studies.

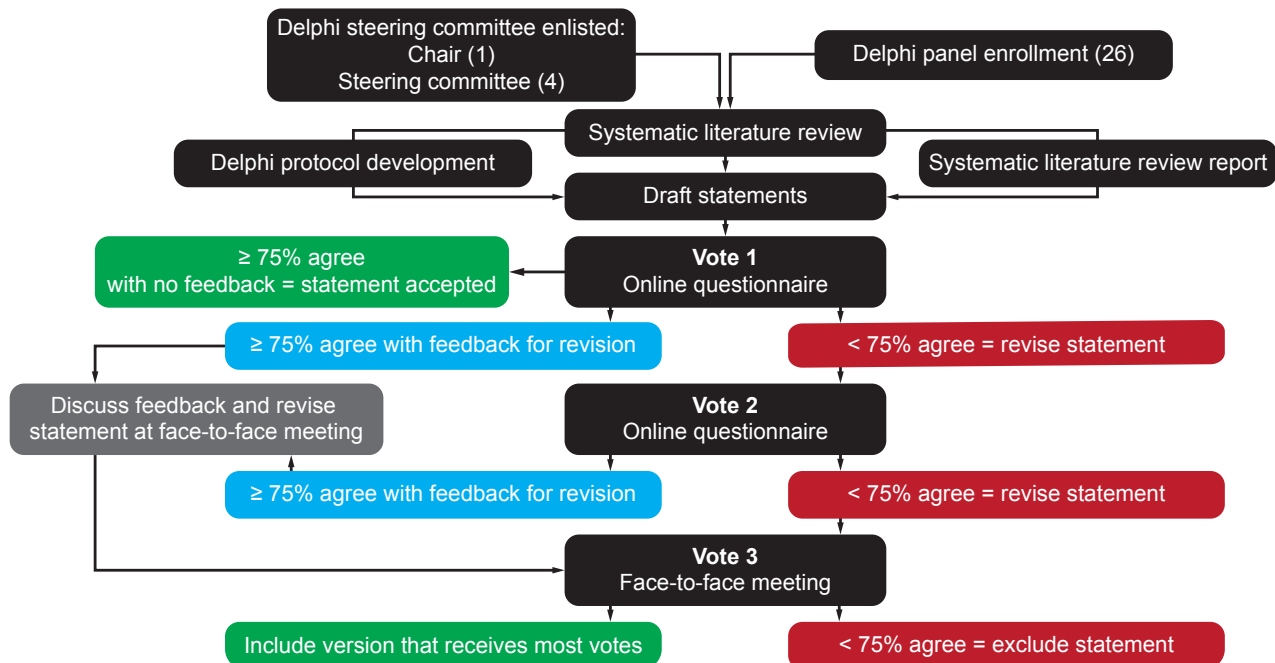
Statements for consensus development were drafted based on the data in the included studies.

Delphi voting process

All members of the steering committee and the Delphi panel, except the Chair, were able to vote in the consensus process. Voting on the draft consensus statements took place over three rounds: two rounds by questionnaire remotely, and one at a face-to-face meeting (Figure 1).

At each voting round, the statements were voted on anonymously using an online questionnaire. Consensus was defined *a priori* as agreement by at least 75% of respondents.

Figure 1. Delphi consensus process based on a $\geq 75\%$ agreement threshold.





What were the outcomes?

The consensus statements provide recommendations on seven key areas:

- awareness of cochlear implants
- best practice clinical pathway for diagnosis
- best practice guidelines for surgery
- clinical effectiveness of cochlear implants
- factors associated with postimplantation outcomes
- relationship between hearing loss and depression, cognition and dementia
- cost implications of cochlear implants.

Twenty consensus statements have been agreed and endorsed by the Delphi panel



What are the implications for clinical practice?

The publication of the consensus statements will be the first step in working towards the development of best practice clinical guidelines for unilateral cochlear implant use in adults with bilateral severe, profound, or moderate sloping to profound SNHL. The Delphi panel and a Consumer and Professional Advocacy Committee (CAPAC) will work to promote the endorsement of the consensus statements regionally, nationally and internationally to improve access to and best clinical practice for the use of cochlear implants for those with hearing loss. Watch out for the full publication.

The ultimate goal of the consensus statements is to raise awareness of cochlear implants, and improve clinical practice to provide the best possible hearing outcomes and quality of life in adults with SNHL who are eligible for a cochlear implant



Who was involved in the Delphi consensus process?

The Delphi consensus process was guided by a non-voting Chair, **Dr Craig Buchman**, Head of Otolaryngology – Head & Neck Surgery, Washington University School of Medicine, USA. The Chair was supported by four steering committee members who were able to vote: **Professor René Gifford**, Vanderbilt University, Nashville, USA; **Dr David Haynes**, Vanderbilt University, Nashville, USA; **Professor Thomas Lenarz**, Medical University of Hannover, Germany and **Professor Gerard O'Donoghue**, University of Nottingham, UK. The Delphi panel comprised an additional 26 experts in the field of cochlear implant use (see **Table 1** for full details).

In addition, a CAPAC of representatives from international cochlear implant user and professional advocacy organizations was involved in the development of the consensus statements. The CAPAC was formed to ensure the patient's voice was considered in the Delphi consensus process. The seven CAPAC members provided feedback on the statements at each voting round but did not have a voting role in the Delphi process.

Table 1. Delphi panel members.

Dr Oliver Adunka, Ohio State University, Columbus, OH, USA

Dr Allison Biever, AuD, Rocky Mountain Ear Center, Englewood, CO, USA

Professor Robert Briggs, The University of Melbourne; Royal Victorian Eye and Ear Hospital; Royal Melbourne Hospital, Australia

Dr Matthew Carlson, Mayo Clinic School of Medicine, Rochester, MN, USA

Dr Pu Dai, PLA General Hospital, Beijing, China

Dr Colin Driscoll, Mayo Clinic School of Medicine, Rochester, MN, USA

Dr Howard Francis, Duke University School of Medicine, Durham, NC, USA

Dr Bruce Gantz, University of Iowa Health Care, Iowa City, IA, USA

Dr Richard Gurgel, University of Utah Hospitals and Clinics, Salt Lake City, UT, USA

Dr Marlan Hansen, The University of Iowa, Iowa City, IA, USA

Associate Professor Meredith Holcomb, Medical University of South Carolina, Charleston, SC, USA and University of Miami, FL, USA

Dr Eva Karltorp, Karolinska University Hospital, Stockholm, Sweden

Dr Milind Kirtane, Seth GS Medical College and KEM Hospital, Parel, Mumbai, India

Ms Jan Larky, Stanford University School of Medicine, CA, USA

Professor Emmanuel Mylanus, Radboud University Medical Center, Nijmegen, Netherlands

Dr Thomas Roland, New York University School of Medicine, New York, NY, USA

Professor Shakeel Saeed, University College Hospital; National Hospital for Neurology and Neurosurgery; Royal National Throat, Nose and Ear Hospital, London, UK

Professor Henryk Skarzynski,* Institute of Physiology and Pathology of Hearing, Warsaw, Poland

Professor Piotr Skarzynski,* Department of Teleaudiology and Screening, World Hearing Center, Institute of Physiology and Pathology of Hearing, Warsaw; Department of Heart Failure and Cardiac Rehabilitation, Medical University of Warsaw; Institute of Sensory Organs, Kajetany, Poland

Dr Mark Syms, Arizona Hearing Center, Phoenix, AZ, USA

Associate Professor Holly Teagle, University of Auckland, New Zealand

Professor Paul Van De Heyning, Antwerp University Hospital, University of Antwerp, Edegem, Belgium

Professor Christophe Vincent, Centre Hospitalier Regional, Universitaire de Lille, France

Professor Hao Wu, 9th People's Hospital, Jiao Tong University School of Medicine, Shanghai, China

Professor Tatsuya Yamasoba, The University of Tokyo Hospital, Japan

Dr Terry Zwolan, University of Michigan, Ann Arbor, MI, USA

*Professors Skarzynski worked jointly with their contributions equivalent to one panel member.

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