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Section Editorial

Cochlear Implant Outcome Reviews

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All clinicians will recognize the challenge of counseling patients and families for the outcomes they might expect from a major surgery. Cochlear implantation has the potential to dramatically change the lives of individuals. With such a wide range of etiologies causing hearing loss that are amenable to cochlear implantation, clinicians know that there is a wide range of potential expected outcomes. The problem is that we often lack high-quality information to base such patient counseling on, especially if the patients belong to a particularly rare group. Such rarer etiologies often mean that each center will have relatively limited experience with a particular condition, and simple searches of published literature often yield only a small case series, which is difficult to draw meaningful conclusions from.

It is from this starting point that we embarked on a suite of systematic reviews of cochlear implant outcomes across a range of etiologies, and you can find the fruits of this labor later in this issue. Our searches also identified a number of good-quality reviews published over the last few years covering the outcomes in auditory neuropathy [1], Coloboma, Heart Defects, Atresia Choanae, Growth Retardation, Genital Abnormalities, Ear Abnormalities (CHARGE[2]) syndrome, Cytomegalovirus (CMV) [3], cochlear nerve hypoplasia [4], connexin 26/GJB2 [5], neurofibromatosis type II [6], and Meniere's Disease [7], which we would commend to you.

Systematic reviews in otology face a number of well-documented challenges, such as the standardization of audiometric outcome data. After the introduction of guidelines, such as PRISMA [8], there has been a general trend across academic literature toward clearer reporting of methods and outcomes. However, reviews in otology and audiology frequently lack the basic data and evidence of any structured approach to appraising the quality of the included studies. Some of this may be driven by our own understanding that our field lacks large randomized trials that are the focus of evidence-based medicine teaching and the implicit inferiority of summarizing and reporting case series and historical cohorts. Although review articles have traditionally attracted less prestige than primary research, they serve a vital function in synthesizing and summarizing a topic for busy clinicians and frequently contribute to the creation of evidence-based guidelines. They also form an essential part of the application process for competitive grant funding, demonstrating to potential funders that the research team has comprehensively reviewed the existing work and highlighting the gaps for potential exploration.

Systematic reviews can only synthesize data that are collected and made public. The inherent challenges in treating the rare conditions would therefore best be addressed by large scale mandatory national, and potentially international, registries of implantation recipients and results. These registries could grow to become essential tools for audit and research. Such registries are not yet commonplace within audiology and otolaryngology, but the proliferation of electronic patient records and increased interest in outcome measures is likely to drive the adoption and demonstration of their utility in other device-heavy specialties, such as orthopedic joint replacements, [9] or where the patient mortality is high, such as cardiothoracic surgery [10]. Although a number of challenges exist in the implementation of national registries, including oversight, funding, and legal implications, the potential benefits are worth exploring [11,12].

There has never been a more opportune time for undertaking systematic reviews across hearing science. The barriers to entry are now low, with high-speed internet access and availability of online journals supplemented by validated tools and guidance for the conduct of reviews. One instance of this is that in the UK, this has been supported by the PROSPERO initiative (https://www.crd.york.ac.uk/PROSPERO/) of the National Institute for Health Research, which provides a database of registered reviews. This allows

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potential reviewers to check whether a review on the same topic is already underway by another group as well as forcing the reviewers to state the review parameters in advance, with the aim of avoiding bias because the criteria are adapted in light of data extraction. The introduction of online software to streamline and organize the reviews has further facilitated the use of these techniques. Rayyan (https://rayyan.qcri.org) and sysrev (http://sysrev.com) provide free tools specifically designed for collaborative systematic reviewing.

Although few clinicians have the time, inclination, or training to undertake a Cochrane review, much clinically useful material can be obtained from the reviews utilizing the principles espoused by Cochrane. The reviews included in this issue highlight the benefit of pooling results across a number of studies. However, they remain constrained by heterogeneity of outcome reporting in primary studies, limiting the potential for meta-analysis and generalizability of subjective narrative synthesis. There are a large number of wonderful and committed clinicians and researchers interested in hearing health, and we hope that when the time comes to revisit these topic areas, the methodological standard of academic output in our field will have continued to improve. We hope that these reviews will provide a gentle nudge toward this.

We hope that by systematically performing a range of SRs on topics in CI implantation, which are periodically updated, we will build a corpus of knowledge over time that can be rapidly accessed and used by the practicing clinicians worldwide as tools for clinical decision making.

Peer-review: Externally peer-reviewed.

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