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Research summary prepared by Brian Lamb. If you have any suggestions for further research summaries please let me know at (brian@ciicanet.org).

Economic Impact of Costs on User Choices

Economics of Cochlear Implant Utilization. By Mark E. Votruba, PhD, and Sarah A. Sydlowski, AuD, PhD. The Hearing Journal October 2019.

Mark Votruba and Sarah Sydlowski have provided a useful review of some of the key arguments for the cost effectiveness of Cochlear Implants with a focus on private payer and insurance systems on implant user's choice. Using the USA as the main example they illustrate how information is important for patients in exploring their choices and how important they will rate the benefits of a CI if they have to pay compared to continued hearing aid use. They note that the growth of deductions from health care plans is making the cost of CIs higher for patients in such systems. They also note that in privately funded systems financial incentives for non-CI providers "weigh in favor of recommending continued HA use over CIs." They also suggest that "Despite compelling clinical data, without up-to-date cost-effectiveness evidence, financial justification is challenging and may be an important barrier to CI utilization." They conclude that appropriate CI utilization will need adequate reimbursement and creating manageable care delivery models. This should include updating cost-effectiveness evidence to include "non-traditional patient populations and non-hearing benefits".

Key Insight: the need for better analysis of the cost benefits for society of Cochlear Implantation are supported by this analysis, especially for private or insurance based systems. However the arguments are also relevant for making the case for more investment in public services. The Spend to Save reports, (http://eurociu.eu/media/files/OO569_EUROPEAN-SPEND-TO-SAVE-REPORT_WEB.pdf) have already sought to make this case in the European context.

The full article can be accessed here:

https://journals.lww.com/thehearingjournal/Fulltext/2019/10000/Economics_of_Cochlear_Implant_Utilization.7.aspx

Lifetime costs of Cochlear Implants

Lifetime Cost of Unilateral Cochlear Implants in Adults: A Monte Carlo Simulation

Christin Thum , Thomas Lenarz , Anke Lesinski-Schiedat , Steffen Fleßa PMID: 32333130 DOI: 10.1007/s10198-020-01188-7 Eur J Health Econ. 2020 Apr 24. doi: 10.1007/s10198-020-01188-7

The authors argue that "due to the increasing prevalence of hearing loss and relaxation of candidacy criteria of cochlear implant (CI) supply, the number of implantations is likely to further increase." As

statutory health insurance systems face financing challenges as CI treatment causes high life-long costs this creates funding issues for the longer term. Additionally, increasing life expectancy and earlier implantation may extend therapy time and cost. The study recognises that individual cases will be different but aims to calculate the possible lifetime cost of unilateral CI treatment in adults.

Looking at the situation from a statutory health insurance perspective, they calculated the relevant cost components of CI therapy. Noting that “Lifetime cost of CI treatment varies according to age at first implantation, respectively remaining lifetime; the earlier the implantation, the higher the overall cost.” According to their simulation, “the average lifetime cost for an adult patient first implanted between the age of 20-80 is at 53,030 € (present value). Cost of implantation and periodic speech processor exchanges show the highest impact on the total cost.”

They note that the CI-related cost for statutory health insurance crucially depends on the patient lead demand for cochlear implants. This means that cost forecasts should also consider the development of demand. The authors conclude that, “Health care systems could face rising expenses for CI supply by technical development. Innovative life-long CIs could achieve significant savings per case that could finance additional implant cost.”

Key Insights. We need to look at the overall costs of CI when advocating in health systems, especially where these depend on insurance given the tendency to underestimate the life time cost of support. However it is also important to set such analysis against the overall cost to health systems of not acting. The identification of the cost of speech process exchanges being a critical factor might spur further research into how to reduce these costs. It may also be that increased use of telehealth could cut costs in support as well.

Abstract available at:

<https://link.springer.com/article/10.1007/s10198-020-01188-7>

The Cost Effectiveness of Bilateral CIs.

The cost-effectiveness of cochlear implants in UK adults.

H. Cutler, M. Gumbie, E. Olin, B. Parkinson, R. Bowman, H. Quadri, F. Gonzalo. Value in Health. November 2019 Volume 22, Supplement 3, Page S886. DOI: <https://doi.org/10.1016/j.jval.2019.09.2563>

When the National Institute for Health and Care Excellence (NICE) updated its guidance on eligibility criteria for unilateral cochlear implants in the UK in March 2019 guidance on bilateral cochlear implants were not updated. Even though there have been advances in technology, price reductions and refined treatment pathways. There have been significant improvements in clinical outcomes and quality of life since the bilateral guidance was published in 2009. Cutler and colleagues sought to update estimates of the cost-effectiveness of unilateral and bilateral CIs in adults in the UK.

They investigated the benefits and costs of no hearing aids, hearing aids, unilateral cochlear implants, simultaneous bilateral and sequential bilateral cochlear implants. The ICER was compared to a cost effectiveness threshold of £20,000 per QALY gained.

They authors found that “a unilateral CI is deemed cost effective when compared to a hearing aid or no hearing aid (ICER of £11,988 and £10,535 per QALY gained). Simultaneous bilateral (ICER of £17,795 and £15,840 per QALY gained) and sequential bilateral (ICER of £20,312 and £17,989 per

QALY gained) CIs are potentially cost effective when compared to a hearing aid or no hearing aid, however they have a much lower likelihood of being cost effective when compared to a unilateral CI.” However they also concluded that “Further research is required to capture additional benefits from a cochlear implant for bilateral CIs in adults.”

Key Insight: traditional analysis of cost effectiveness is likely to underestimate the benefits unless a wider set of criteria are included. While this analysis shows that they are not as cost effective when compared to unilateral CI the simultaneous bilateral option was within the £20,000 threshold of QALY gained.

Abstract available at:

<https://www.valueinhealthjournal.com/action/showPdf?pii=S1098-3015%2819%2934941-1>