Research Briefing-September 2023. Research compiled by Brian Lamb.

Patient-centered empirical research on ethically relevant psychosocial and cultural aspects of cochlear, glaucoma and cardiovascular implants – a scoping review.

Sabine Schulz, Laura Harzheim, Constanze Hübner, Mariya Lorke, Saskia Jünger and Christiane Woopen. BMC Medical Ethics (2023) 24:68. https://doi.org/10.1186/s12910-023-00945-6

This is a scoping review which aimed to provide an analysis of existing evidence on psychosocial and cultural aspects of implants, including cochlear implants and the implications of this for patient-centred empirical research. Of the sixty-nine studies covered fifty where on the impact and usage of Cis. The authors wanted to explores the ethical aspects associated with the everyday use of implants and how these impacts on the individual `user's world and how this needs to be considered in thinking about technical developments of the implant. This follows a number of other studies that have started to explore the real-world implications of technical advances for users and families. The review provides a wide ranging and detailed exploration of the current state of research on aspects of CI usage from a patient perspective and points towards the need for patient literacy in understanding the potential impact of such devices.

As the authors note implants change perceptions and norms relating to the body and how those recipients will see themselves, raising ethical issues about the impact of implants on autonomy and capacity to particate in society, even where the implants are seen as being positive. The paper offers a comprehensive review of these issues from deaf identity to the importance of being able to access long term support for the implant user.

The authors conclude by noting that "Patient-centered approaches could benefit from an explicit and transparent ethical framework. Eventually, this requires creating awareness for cultural and identity-related issues, on the side of patients as well as healthcare professionals and implant engineers. Additionally, (technology-related) individual and organizational HL is needed to empower patients and strengthen their autonomy. Sustainability in implant care needs to be given more consideration since the implant affects an individual's whole lifespan."

Implications for Policy

While the technical development and refinement of CI's generates significant funding and attention the consideration of the impact of users in real life and the interface between the technology and the issues this raises for users has been less focused on. This research opens up some important questions on what the ethical framework should be for greater user awareness and support in respect of their implants. Crucially it raises the issues of sustainability and long-term support for users of Cis as a fundamental aspect of benefiting from the technology given the dependence users have on it. It also points towards the need for greater awareness of these issues amongst professionals and support for patient literacy so that users make informed decisions and ensue full benefit from their implant.

Paper can be accessed at; https://bmcmedethics.biomedcentral.com/counter/pdf/10.1186/s12910-023-00945-6.pdf

Quality Standard for Rehabilitation of Young Deaf Children Receiving Cochlear Implants.

De Raeve, L.; Cumpat, M.-C.; van Loo, A.; Costa, I.M.; Matos, M.A.; Dias, J.C.; Mârtu, C.; Cavaleriu, B.; Ghergut, A.; Maftei, A.; et al. Medicina 2023, 59, 1354. https://doi.org/10.3390/medicina59071354

The problem of huge differences in the service delivery models and intervention between countries, the same country, and between CI teams has often led to inconsistent practice during a period where Cis for children is becoming more routine. The authors therefore created quality standards for children receiving CIs.

To develop quality standards for the rehabilitation of deaf children receiving CIs, they interviewed 11 local rehabilitation experts on CIs from the four partner countries involved in the VOICE project and the outcome of the analysis of 848 publications related to the theme and retrieved from six databases. The Delphi method approach was used by 18 international rehabilitation specialists in CI intervention to discuss and agree on these quality standards. More than 90% of the international experts agreed on 29 quality standards over four domains: (1) general standards, (2) fitting, (3) rehabilitation, and (4) quality standards for staff.

“These standards for the rehabilitation of children with CIs can help health systems and, more specifically, CI teams and all those involved in the rehabilitation of children with CIs, to provide quality and State-of-the-Art care. We are absolutely convinced that by using these standards, they will improve the quality of their service delivery, and the result will be rehabilitation with better results.” The authors also conclude that further research is needed to address the issue of the rehabilitation of young children based on the work they have done.

The research can be accessed here; https://www.mdpi.com/1648-9144/59/7/1354

You can also download the Quality Standards for rehabilitation of young deaf children receiving CI’s from the project website: https://lnkd.in/dBuri3qA

At this website you can also download a handbook for therapists, you can follow an e-training course on rehab and there is a lot of information available for parents.

Read more at https://ciicanet.org/2023/08/08/quality-standards-for-rehabilitation-in-children-with-ci/

Policy Implications.

It is important to ensure that there is learning and consistency of good practice in rehabilitation to ensure that users have the best possible experience and gain the most from their implant. Development of standards in these areas and their promotion is therefore crucial to ensure best practice. These guidelines are an important step to supporting that process.

Do Not Go Gentle into That Deaf Night: A Holistic Perspective on Cochlear Implant Use as Part of Healthy Aging

Angelika Illg, Julia Lukaschyk, Eugen Kludt, Anke Lesinski-Schiedat, and Mareike Billinger-Finke J Pers Med. 2022 Oct; 12(10): 1658. Published online 2022 Oct 5. doi: 10.3390/jpm12101658

The authors found that two groups of elderly cochlear implant (CI) recipients experienced significant increases in their hearing-related quality of life (HRQOL) and in speech perception after 3 months of CI use and maintained this benefit at 12 months of CI use. They found that the results emphasize the ability of CI use to not only improve hearing results but also to improve the lives of elderly users. They also note this is consistent with many other studies. They also found that cost benefit estimates for CI underestimated the benefits as "if the influence of CI treatment on cognitive decline was factored in, the cost-effectiveness and effectiveness of CI provision would be even greater" and call for "shifting the perspective towards an "early" treatment in elderly people with the goal of preventing both auditory deprivation and the deterioration of cognitive abilities."

Further, the paper includes a call to action when they note that: "hearing loss is common in elderly people; however, those experiencing it need not suffer it, just as elderly people with osteoarthritis can receive a prosthetic hip and walk again, elderly people with severe to profound sensorineural deafness can obtain a CI and hear again. To this end, it would be beneficial if (1) professionals counselled candidates on the holistic benefits of CI use and (2) information sources available to perspective candidates were better adapted for a lay audience. Further, as regards to funding bodies, the cost-effectiveness of CI provision in elderly candidates is very likely underestimated because it does not factor in the potential effect of CI use on preventing or impeding cognitive decline."

Implications for Policy

This study and analysis make a powerful case for seeing CI provision on the same basis as other intervention for older people. Further that we need a holistic understanding of the benefits of CI and not just focus on hearing restoration but the additional benefits this brings. To achieve better awareness more information and support on decision making is needed. As the authors also note the cost benefit of CI is often underestimated because it does not include prevention of cognitive decline.

Paper can be accessed here; https://www.mdpi.com/2075-4426/12/10/1658

Direct cost of cochlear implants in Germany – a strategic simulation

Christin Thum, Thomas Lenarz, and Steffen Fleßa. Health Econ Rev. 2022; 12: 64. Published online 2022 Dec 24. doi: 10.1186/s13561-022-00405-8

The potential addition demand for CI's as older populations grow is an important consideration for health planning. The authors looked at CI demand by adults in Germany and the related cost for CI supply for the SHI and how these might increase in the future.

They concluded that "demand will grow due to demographic aging and its related changes in the spectrum of disease towards chronic diseases such as hearing loss. Additionally, technical progress leading to an expanded CI indication and increasing acceptance of CI therapy among hearing impaired people will raise implantation numbers and reduce the current undersupply with CI among potential candidates. CI implantation will become a common treatment. This can be seen as a favourable development since hearing

loss is a risk factor for various other care- and cost-intensive diseases (e.g. dementia, depression, fractures) that can be prevented. Compared to the status quo, they expect annual CI supply cost to rise by 16% over the next 40 years, whereby gradual treatment process optimization and economies of scale also may unfold cost-saving effects."

Implications for Policy

We need to estimating for the growth in the population that could benefit from a CI and ensure that this is funded given the capacity for CI to address the costs of preventable co related health problems that occur if hearing loss is not addressed. They also point to the economies of scale that may be brought about by increasing provision that would further support the cost benefit of ensuring that more people have CI's.

Paper can be accessed here; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9789618/

Societal costs of severe-to profound hearing loss among adults without cochlear implants– A health economic evaluation using a Markov model. Marit Preuter, Karin Johansson. RISE rapport 2023:43 ISBN 978-91-89757-91-2

The primary aim of this project was to develop a health economic model that enables an assessment of the societal costs of Severe to Profound Hearing loss (STPHL) among adults in Sweden when not treated with CI. The secondary aim of the project is to enable an analysis of the societal costs of STPHL among adults without CI, within the Nordic countries. The authors developed a number of simulations to assess the additional costs of not using CI's using a Markov model including lost productivity and poorer health outcomes leading to additional care costs. They point to particularly strong effect in looking at the additional costs related to the increased number of falls that would occur by not addressing hearing loss with CI's.

The authors note that the assumptions used in the report including the limited number of health outcomes, time range, and the fact that risks of less severe hearing loss are included lead to an underestimation of the costs. "It is most likely that the societal costs of STPHL among adults without CI treatment are higher than accounted for in this calculation, which makes the model conservative." Even with that in mind they found that "The calculations show us that adults with STPHL who do not receive cochlear implants generate more costs for the society than a similar cohort without this condition. Over a period of 23 years, the additional costs for the simulated cohort with STPHL are expected to be 23,9 billion SEK, which equals approximately 1,2 million SEK per person." Most importantly the authors state that the real value in the model is to isolate particular variables and the costs associated with these. They identify falls and associated care costs that follow from these to be the most significant in the Swedish context.

As well as beginning a very useful resource for calculating the additional costs of not taking action in Sweden the model developed by the authors "can be used for evaluations in other Nordic countries as well."

Implications for Policy

This study adds to the growing weight of evidence that investment in CIs saves health and social systems money and also support people to stay more economically active. There are very specific consequences in terms of costs on the social care system because of the cumulative health effects leading to falls. It is especially useful in proposing a model that is applicable to other Nordic countries.

Hearing Loss and Dementia Prevalence in Older Adults in the US

Huang AR, Jiang K, Lin FR, Deal JA, Reed NS. JAMA. 2023 Jan 10;329(2):171-173. doi: 10.1001/jama.2022.20954. PMID: 36625819; PMCID: PMC9856835.

A new study led by researchers at Johns Hopkins found that older adults with greater severity of hearing loss were more likely to have dementia, but the likelihood of dementia was lower among hearing aid users compared to non-users. The study covered 2,413 individuals, about half of whom were over 80 and showed a clear association between severity of hearing loss and dementia. Prevalence of dementia among the participants with moderate/severe hearing loss was 61 percent higher than prevalence among participants who had normal hearing. Hearing aid use was associated with a 32 percent lower prevalence of dementia in the 853 participants who had moderate/severe hearing loss.

For the new study, Huang and colleagues analysed a nationally representative dataset from the National Health and Aging Trends Study (NHATS). Funded by the National Institute on Aging, the NHATS has been ongoing since 2011, and uses a nationwide sample of Medicare beneficiaries over age 65, with a focus on the 90-and-over group as well as Black individuals. The findings are consistent with previous studies showing that hearing loss might be a contributing factor to dementia risk, and that treating hearing loss may lower dementia risk. The authors note that;

“This study refines what we’ve observed about the link between hearing loss and dementia, and builds support for public health action to improve hearing care access,” lead author Alison Huang. The growing evidence that hearing loss could be linked to the risk of dementia has called attention to implementing possible strategies to treat hearing loss including earlier intervention to address hearing loss through hearing aids and CIs.

Implications for Policy

This study provides additional strong evidence on the positive impact of hearing aids on cognitive decline and dementia also raises the possibility that CI’s may also provide similar protection, especially in younger patients, and this is consistent with evidence to date in research on CI’s.

Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial

Prof Frank R Lin, MD, James R Pike, MBA, Prof Marilyn S Albert, PhD, Michelle Arnold, PhD, Sheila Burgard, MS, Prof Theresa Chisolm, PhD et al. The Lancet. July 17, 2023 DOI: https://doi.org/10.1016/S0140-6736(23)01406-X

The Aging and Cognitive Health Evaluation in Elders (ACHIEVE) trial was designed to determine if using hearing aids was protective of developing dementia and cognitive decline. It recruited 977 study participants aged 70 to 84 with mild to moderate hearing loss, not using a hearing device. Participants were recruited from two sources; from an existing cardiovascular study (ARIC) and form the healthy, general population. Participants were then randomly assigned to a hearing intervention group (receiving hearing aids) and a successful aging health education group (receiving health education). Their cognitive functioning was monitored over three years.

After three years, there was no difference in cognitive decline between the hearing aid and the health education group. However, when analysing the “ARIC” and the general population group separately, the

"ARIC" group who received hearing aids showed a 48% reduced cognitive decline, compared to the "ARIC" group who received health education. There was no such difference in the general population group. Compared to the general population group, participants in the "ARIC" group had more risk factors for cognitive decline and dementia, they were older, more likely to live alone and had already at the beginning of the study lower cognitive scores. The authors summarize the findings: "In older adults at increased risk for cognitive decline, hearing intervention slowed down loss of thinking and memory abilities by over 48% over 3 years." They concluded that "These findings suggest that a hearing intervention might reduce cognitive change over 3 years in populations of older adults at increased risk for cognitive decline but not in populations at decreased risk for cognitive decline."

Implications for Policy

As with other recent studies this shows that there is a positive effect on cognitive decline by using hearing instruments for those at risk but in this case not in populations at decreased risk of cognitive decline. This adds further weight to need to address hearing loss early in at-risk populations.

For more information you go to https://www.achievestudy.org/about

For further information on the implications for policy of links with cognitive decline and dementia see the CIICA and EURO-CIU briefing at; https://ciicanet.org/2021/12/01/ciica-and-eurociu-launch-new-resource-why-hearing-wellmatters-for-healthy-ageing/

It is time to change our message about hearing loss and dementia. J Am Blustein J, Weinstein BE, Chodosh J.

Geriatr Soc. 2023;1-4. doi:10.1111/jgs.18323

In this opinion article the authors make a plea for more nuanced public communication about the links between hearing loss and dementia. They note that while in scientific research is clear that there is an association between hearing loss and dementia the public perception and understanding of risk can be very different from the scientific one, resting more on the assumption that risk will equal future likelihood. The authors therefore fear that the current public discourse which associates hearing loss with a greater risk of dementia is in danger of feeding the stigma around hearing loss and damaging both public acceptance of hearing loss and creating unnecessary fear. That while "Public understanding that hearing loss is a prelude to dementia could catalyze greater use of needed hearing health care—a good outcome." The dangers of doing so are that "It will put people with hearing loss at risk for social exclusion and discrimination in the workplace" due to the association with dementia.

They conclude that "Given the complexity and uncertainty of the hearing loss–dementia link, and in view of the potential harms of stigmatization, we favor constructive messages that minimize harm while motivating people to act. One such message might be: "Hearing better can help you think better."

Implications for Policy

This article points to the importance of ensuring that arguments around hearing loss and dementia are framed well and recognise the potential consequences of how the dementia and hearing loss links might have unintended negative consequences in public communications. It also emphasises the importance of positive messages around hearing and cognition which might help public engagement. Positive public

messages in this area may also have more chance of engaging public support and understanding than negative ones and similar effects have been found in other health awareness campaigns.

It would be interesting to see research conducted on the impact of different messaging strategies and which are most effective. Also, this article is referring to public messaging. It may still be in working with Government and health funders, that properly framed policy positions on the association between hearing loss and dementia could be powerful in ensuring both decision makers attention and in calls for additional funding for research and provision because of the potential impact of dementia and the focus on this health issue. Article can be accessed here; https://agsjournals.onlinelibrary.wiley.com/doi/10.1111/jgs.18323