

USEFUL REPORTS FOR ADULT ADVOCACY WORK: October 2022

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

The Future of Cochlear Implants

Fan-Gang Zeng, Celebrating the one millionth cochlear implant, JASA Express Letters 2, 077201

(2022); <https://doi.org/10.1121/10.0012825>

This useful review reflects on the development of cochlear implants as the number of users globally surpassed 1 million last year. While the author notes that “Cochlear implants have been the most successful neural prosthesis” the article also challenges the sector to examine how future developments can tap into developments happening in other fields with the “neurotechnology community” and claims that there is “little or no investment being made in the critical electrode-to-neuron interface.” The author sees this as holding out the best promise of further improvements in the performance of implants.

Implications for Policy

It is important to recognise the huge steps that have been taken in the development of Cochlear Implants and their use since inception and this article gives a helpful summary. But it also points for the continued need for funding research and development to take advantage of the latest innovations in other areas of neurotechnology and their implications for CI.

Health Literacy and Cochlear Implants

Hübner, C.; Lorke, M.; Buchholz, A.; Frech, S.; Harzheim, L.; Schulz, S.; Jünger, S.; Woopen, C. Health Literacy in the Context of Implant Care—Perspectives of (Prospective) Implant Wearers on Individual and Organisational Factors. *Int. J. Environ. Res. Public Health* 2022, 19, 6975. <https://doi.org/10.3390/ijerph19126975>

Health Literacy—the ability to understand and navigate healthcare options as a patient is becoming central to our understanding how we can ensure health interventions such as cochlear implants can be used to maximum benefit. This valuable research looked at how technical innovation challenges healthcare systems’ ability to meet patient needs and be in tune with patient values and expectations. Medical Technology also poses questions and challenges for those who use it and having the right information and support can be crucial. The authors argue that “Accessing and understanding new information, navigating healthcare, appraising the role of the implant in body perceptions and everyday life requires health literacy (HL) of those affected as well as an HL-responsive healthcare system. The interconnectedness of these aspects to ethically relevant values such as health, dependence, responsibility and self-determination reinforces the need to address HL in implant care.”

The authors undertook a qualitative approach and conducted group discussions and a diary study among wearers of a cochlear implants, glaucoma or cardiovascular implant (or their parents). They found in relation to CI that:

“The capability to avert implant failure, or ensure or optimise (in the case of CI) functioning presupposes sufficient information and knowledge about the implant, technology and disease and empowers patients to handle the implant and disease in everyday life”

For users:

“the implant was perceived as part of the body and wearing it evoked a sense of normalcy blending in with everyday life.”

Looking at where those contemplating implants or seeking further information, they found that:

“Overall, information seems to be mainly obtained through internet research, exchanges in a private context (self-help groups, family, friends, random encounters, etc.) or consultations with health professionals.”

While implant users were often seen as the experts in how the technology could impact their lives:

“the high speed of technological progress in the cochlear implant area. This puts implant wearers in the position of informing their doctors on technical features and functioning.”

For the group with CI's pointed to the importance of:

“assuming an active patient role—being proactive in care management, claiming certain services and taking responsibility in the context of provision of care—was accentuated. This was perceived as a prerequisite for imparting empowerment”

Problems with using implants were also noted:

“With regards to cochlear implants, the feeling of dependence directly relates to the production of manufacturers (functionality, technical state and range of functions of the respective implant-make) and indirectly to the access to alternative care services (after implantation).”

“In the case of cochlear implants, the general attitudes toward hearing impairment in society (especially when negative) may cause or reinforce tension and uncertainty.”

The authors conclude in relation to CI's that “Our study shows that, in the everyday use of cochlear implants, basic understanding of technology and functional range (incl. accessories) and awareness of one's own responsibilities are essential for the successful use and protection of the implant in everyday life.”

The full article can be accessed here; <https://www.mdpi.com/1660-4601/19/12/6975/htm>

Implications for Policy

These insights into what is necessary to ensure that people can successfully use cochlear implants point to the crucial issues of the patient context, knowledge and values to ensure that implants can deliver the promised benefit. Policy needs to consider how patients are supported to gain knowledge of hearing loss and to be able to have the information and confidence to use this in working with clinicians and professionals to ensure that the model, features and aftercare meets their needs.

Further it needs to be recognised that currently the support networks and advice mainly come from other users, the internet and self-help groups. More thought needs to be given to how information and support can be provided through choosing an implant, the process of fitting and ensuring that the right aftercare is in place. This shows that support HL for patients considering and using CI's should be at the centre of the process. For this to happen, as the authors argue, we need a HL responsive healthcare system which recognises the agency of the user and supports this.

Impact of Revised CI Eligibility Guidelines in England.

These two studies of regional centres reveal very differing experiences of the impact of the change in National Guidelines to Cochlear Implant Access. As such they provide a crucial insight into what impact changing access criteria have on patient access and how this needs to be promoted and managed.

Thompson L, Bazeer HZ, Young B, Smith G, Blackaby J, Wasson J, Trinidad A. Cochlear implant eligibility in an adult hearing aid population: a multi-perspective service evaluation of a patient referral pathway at a British district general hospital. *J Laryngol Otol.* 2022 Aug;136(8):755-759. doi: 10.1017/S0022215121004291. Epub 2022 Jan 10. PMID: 35000642.

The aim was to quantify patient eligibility for cochlear implantation following National Institute for Health and Care Excellence 2019 guidelines (TA566) over five years and identify factors influencing patients' decisions surrounding cochlear implantation referral.

A service evaluation was conducted at a district general hospital, comprising cochlear implantation eligible patients. They compared eligibility numbers for 2014–2019 by application of TA566 versus 2009 (TA166) guidelines and also looked at patient interview transcripts and questionnaires.

The authors found that there was a 259 per cent average increase in cochlear implantation eligibility from 2014 to 2019. They also found that there were a number of barriers to cochlear implantation these included patient-centred issues such as health-related anxieties and implantation misperception. There were also external barriers such as the difficulty in traveling to regional implant centres. They found that motivating factors for cochlear implantation were improved quality of life and access to local cochlear implantation services.

They concluded that the new TA566 guidelines which increased cochlear implantation eligibility, are putting pressure on cochlear implantation centres and referring hospitals. Current referral systems have external and patient-centred implantation barriers. They call for a rethink of implantation delivery to meet “increasing populational demands and improve accessibility for those most vulnerable to these barriers.”

Constable JD, Broomfield SJ, Romeo E, Clamp PJ. The potential effect of the updated national criteria on adult cochlear implantation in England and Wales. *Cochlear Implants Int.* 2022

May;23(3):119-124. doi: 10.1080/14670100.2021.2009212 Epub 2021 Dec 9. PMID: 34886760.

The authors investigated the effect of the 'new' TA566 criteria on adult CI at a regional implant centre by examining Adult CI assessments between 1st January 2015 and 31st December 2018

(before new criteria) and between 7th March 2019 and 31st August 2019 (after new criteria) which were retrospectively examined. They then calculated eligibility and uptake rates predicted and the change in annual implantation under the new guidance.

They found that “552 patients were identified in the first study period, with a median of 148 assessments per year. Of 533 with complete assessments, 58% were eligible, of whom 74% were implanted. Retrospective application of the new criteria was possible for 277 patients; eligibility and uptake were 67% and 80%, respectively. In the second study period (n = 60), new criteria eligibility was 62% and uptake was 78%. Increased eligibility under the new criteria predicts an increase of between 13 and 23% in annual adult implantation.”

They concluded that the guidelines had increased implant eligibility. They note that if there are consistent referral patterns, the predicted increase in adult implantation is considerably less than that predicted elsewhere.

Implications for Policy

These studies given differing assessments of the potential impact of the new guidelines. A direct comparison of their conclusions is difficult as the methodologies differ. Both studies show that the extension of eligibility was successful in increasing the numbers implanted but to different degrees than was anticipated. What is crucial when looking at changes to CI criteria is to ensure that the health system has the resources to cope with increased demand, that information for patients is clear and that geographical access to implant centres. Increasing demand is likely to provoke further debates about how to organise and fund and organise CI services and it is important that the patient voice is part of those discussions, especially in times of financial stress on health services. It is also important to keep in view that an increase in adult implantation has the potential to save the health system and society money due to the proven cost-effectiveness of CI.

Cognitive Decline and Hearing Aids

Bucholc, M, Bauermeister, S, Kaur, D, McClean, PL, Todd, S. The impact of hearing impairment and hearing aid use on progression to mild cognitive impairment in cognitively healthy adults: An observational cohort study. *Alzheimer's Dement.* 2022; 8:e12248.

<https://doi.org/10.1002/trc2.12248>

The authors assessed the association of self-reported hearing impairment and hearing aid use with cognitive decline and progression to mild cognitive impairment (MCI) using a large referral-based cohort of 4358 participants obtained from the National Alzheimer’s Coordinating Centre.

The authors conclude that hearing impairment is independently associated with accelerated cognitive decline and higher risk of incident MCI. They found that “hearing aid use is linked to lower rates of cognitive decline and reduced risk of incident MCI, with hearing aid users having more than 50% lower risk of MCI, compared to those not using hearing aids.” There was also “no significant differences in risk of developing MCI and cognitive decline...between participants experiencing no hearing loss and those diagnosed with hearing impairment using hearing aids.” They conclude that “use of hearing aids may help mitigate cognitive decline associated with hearing loss, offering an actionable strategy to reduce the incidence of MCI.”

They also therefore think that while causality still has to be determined they “infer that increased access to quality hearing health care might prove an effective preventive intervention to mitigate the impending dementia epidemic.”

The paper can access here; <https://alz-journals.onlinelibrary.wiley.com/doi/full/10.1002/trc2.12248>

Implications for Policy

This research adds to the growing weight of evidence of the potential beneficial treatment effect of hearing aids on cognitive decline. This reinforces the need to introduce hearing screening programmes and the proactive promotion of hearing aids to address the consequences of hearing loss. This also has implications for CI provision in that addressing hearing loss earlier will ensure that all who could benefit are on the hearing loss pathway and can have their hearing checked routinely. Addressing the impact of hearing loss is also important to society in maintaining health and independence and reducing cost of dementia on individuals and society.