

DEFINITION OF ‘OPTIMALLY AIDED’ FOR EXPERIENCED ADULT HEARING AID USERS WITH SEVERE-TO-PROFOUND DEAFNESS

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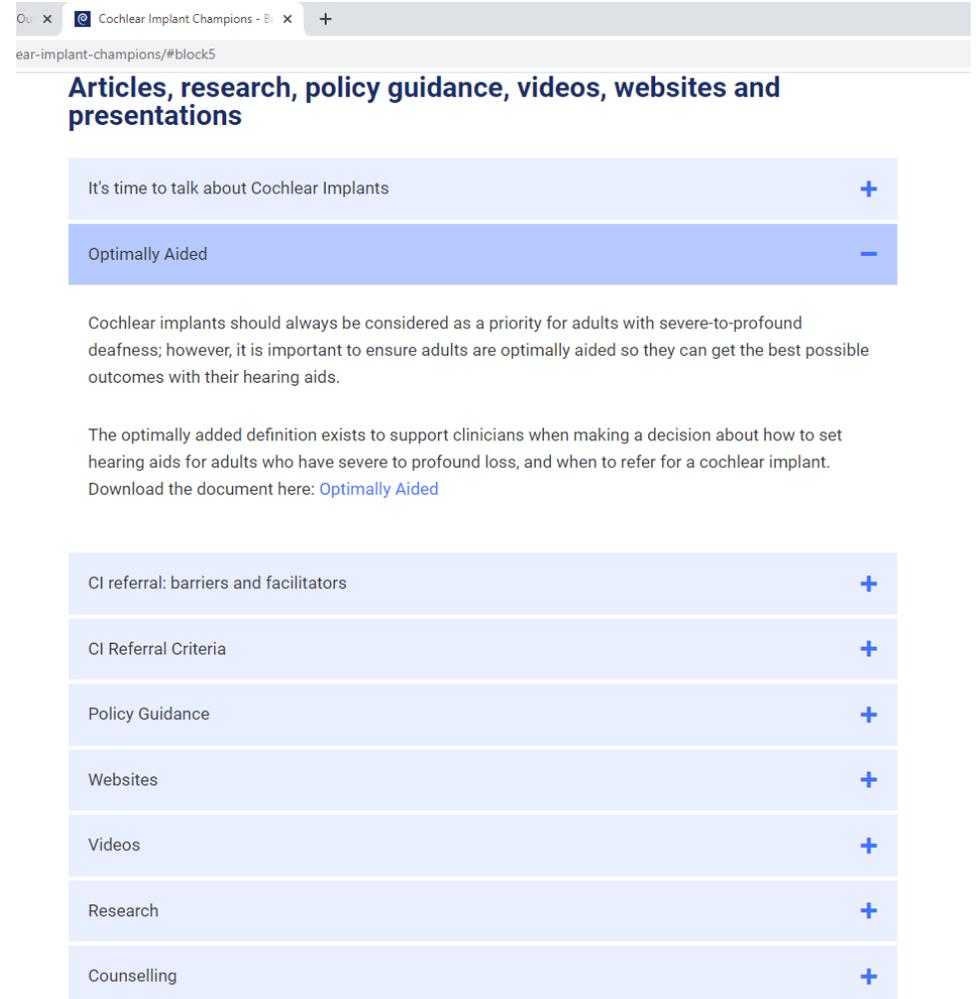
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Current document available on the Champions webpage:

Cochlear implants should always be considered as a priority for adults with severe-to profound deafness; however it is important to ensure adults are **optimally aided** so they can get the best possible outcomes with their hearing aids.

Written and agreed by **BAA SQC** and **BSA ARIG**, July 2019.

<https://www.baaudiology.org/professional-information/cochlear-implant-champions/#block5>



The screenshot shows a web browser window with the URL <https://www.baaudiology.org/professional-information/cochlear-implant-champions/#block5>. The page title is "Articles, research, policy guidance, videos, websites and presentations". Below the title is a list of items with expand/collapse icons:

- It's time to talk about Cochlear Implants (+)
- Optimally Aided (-)

The "Optimally Aided" section is expanded, showing the following text:

Cochlear implants should always be considered as a priority for adults with severe-to-profound deafness; however, it is important to ensure adults are optimally aided so they can get the best possible outcomes with their hearing aids.

The optimally added definition exists to support clinicians when making a decision about how to set hearing aids for adults who have severe to profound loss, and when to refer for a cochlear implant. Download the document here: [Optimally Aided](#)

Below this text is another list of items with expand/collapse icons:

- CI referral: barriers and facilitators (+)
- CI Referral Criteria (+)
- Policy Guidance (+)
- Websites (+)
- Videos (+)
- Research (+)
- Counselling (+)

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Severe and profound deafness

- Adults need additional support compared to their better hearing peers.
- Adults have additional complexities within the auditory system whereby simply adding gain will not eliminate their communication problems.
- The result of a hearing aid fitting is limited by the processing capability of the peripheral and central auditory system and few patients with severe sensorineural hearing loss will achieve high levels of speech recognition in complex listening situations²
- Individuals are highly reliant on their devices, having unique amplification needs.

2 = Souza P (2009). Severe Hearing Loss - Recommendations for Fitting Amplification. Audiology Online, 19 Jan 2009. <https://www.audiologyonline.com/articles/severe-hearing-loss-recommendations-for-893>

Aim and scope

- This document relates to **optimising amplification when listening to speech** for people with severe and profound deafness.
- It is important to consider that not all uses of hearing aids have the goals of hearing speech. Deaf adults, who use British Sign Language to communicate, may have different listening goals¹.
- Hearing aid settings should be optimised to suit individual needs and goals

1 = Hulme et al (2021) Exploring the lived experiences of British Sign Language (BSL) users who access NHS adult hearing aid clinics: an interpretative phenomenological analysis, International Journal of Audiology, DOI: [10.1080/14992027.2021.1963857](https://doi.org/10.1080/14992027.2021.1963857)

Audiologists *should consider:*

Binaural aiding

Verification

**Amplitude
compression**

Directionality

Volume controls

Ear moulds

**Telecoil loop
wireless
connectivity**

**Remote
microphones**

Binaural aiding

- Binaural aiding should be offered to all adults, irrespective of level of deafness, duration of deafness and previous experience with amplification, two hearing aids should be offered (even if this has been unsuccessful in the past).
- Binaural aiding increases opportunity for binaural listening advantage
- **Binaural aiding ensures both ears/auditory nerves are stimulated which limits/prevents auditory deprivation meaning a Cochlear Implant can be considered in either ear (now or in the future).**
- Some adults may experience binaural interference so careful validation and evaluation is required.



Verification

- **A validated prescriptive procedure** should be used to guide frequency-gain settings. E.g., NAL/DSL can be used as a start-point when prescribing output.
- **Previously used settings/prescriptions are important to consider**; patient-preference and best-outcome settings will vary for each adult. E.g., long-term users of amplification may prefer significantly more gain than the prescription recommends.
- Adults transitioning from paediatric services should be offered the opportunity to remain on their chosen prescription (likely to be DSL).
- For adults with an air-bone gap, bone conduction thresholds should be incorporated into the prescription.
- When REAR is not possible, a measured RECD and coupler fitting can be used and is equally as accurate as REAR (with small vents or closed ear moulds).



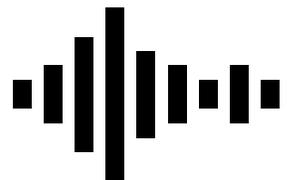
Amplitude compression ratios and compression speeds

Fast-acting compression distorts the speech envelope. To limit this distortion, lower compression ratios are recommended [≤ 1.5], ³ Slow-acting compression does not distort the speech envelope significantly so compression ratios of ≤ 3.0 can be used ⁴. Most hearing aids default to fast acting compression, for advice on selecting slow acting compression, speak to your hearing aid manufacturer.

As a rule, the clinician should seek to introduce minimal distortion to the speech signal, whilst aiming to maximise speech recognition. Features that cause significant distortion include fast-acting compression and high compression ratios, noise reduction, and frequency-lowering.

3 = Windle, R. (2021) Setting hearing aids for older adults. Invited presentation, BAA 2021 annual conference, Manchester, Nov 2021. Available at: <https://www.researchgate.net/profile/Richard-Windle/research>.

4 = Dillon, H. (2012). 'Hearing aids'. 2nd ed. New York, Sydney: Thieme: Boomerang Press.



International S&P guidance ⁵

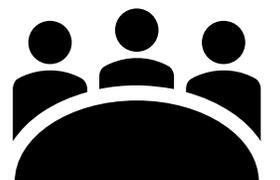
- **Directionality:** Automatic/adaptive directionality should be used rather than fixed directionality as default, although the individual may like more directional programs to be available
- **Volume controls:** Separate volume controls for each ear/aid can allow for the sound/signal on one side of the listener to be increased, without increasing the volume of all sounds around the listener and this may improve the signal to noise ratio/listening in noise [but settings should always be based on patient-preference]
- **Remote microphones** Adults with severe and profound hearing loss can benefit from remote microphone systems in a range of situations and should be fully informed about them.

5 = Turton L, Souza P, Thibodeau L, et al. Guidelines for Best Practice in the Audiological Management of Adults with Severe and Profound Hearing Loss. Semin Hear. 2020;41(3):141-246. doi:10.1055/s-0040-1714744. Available at: <https://pubmed.ncbi.nlm.nih.gov/33364673/>



Validation and Evaluation

- Subjective outcome measures include validated **self-report questionnaires** (relating to hearing, tinnitus, or quality of life) e.g., COSI, GHABP, IOIHA, HHI.
- **Aided speech testing in quiet** including live voice or recorded speech tests, using phonemes, words, or sentences e.g., CVC test, AB words, BKB sentences, IHR sentences, CUNY sentences.
- **Subjective feedback/self-report should always be the gold standard, as speech tests do not represent real-world listening situations.**



Cochlear Implant referral

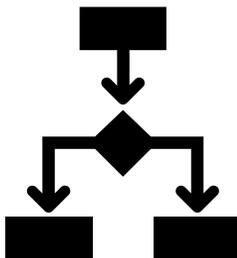
- **Thresholds of 80dB HL or greater in both ears at any 2 frequencies [0.5, 1, 2, **3**, 4 kHz]. Aided AB word speech testing - less than 50% phoneme score with a 70 dB A presentation level ⁷.**
- Adults who don't meet the NICE audiometric criteria but do show poor benefit from hearing aids (and score poorly on speech tests) may have Cochlear Dead Regions and should still be considered for CI referral. TEN testing prior to referral is useful but not essential ⁸
- **If patient preference is for HA settings well under/over a validated prescription target, consider offering an additional programme with 'optimised settings/set to target' so they can trial the 'optimised settings' in real-world listening situations (without losing their preferred settings).**

⁷= NICE (2019) Cochlear implants for children and adults with severe to profound deafness . Technology appraisal guidance [TA566]. Publication date: 7th March 2019.

Available at: <https://www.nice.org.uk/guidance/ta566>

⁸= Bird, J. (2010) Optimisation of Service Provision for Adults with Severe and Profound Hearing Loss, Cochlear Implants International, 11:sup2, 37-42, DOI:

10.1179/146701010X12726366068652.



Take home messages

- Hearing aid settings are part of a bigger picture: **Implantable devices, Assistive Listening Devices, lip-reading classes, Access to Work, communication training for family/friends/carers, peer support, self-management strategies, self-help groups, Hearing dogs, Deaf-awareness training, and tailored support in the workplace.**
- Cochlear implants should always be considered as a possible treatment option for all adults with severe-to-profound deafness.
- Optimisation is an ongoing process: maintenance, reassessments, and self-management strategies.

