Title: Optimising outcomes for children with unilateral hearing loss

Primary supervisor: Hannah Cooper (UCL Ear Institute and Royal Berkshire NHS Foundation Trust)

Thesis committee: Amanda Hall (Aston University and University Hospitals Bristol and Weston NHS Foundation Trust), Katie Ireland (Royal Berkshire NHS Foundation Trust), Peter Keating (UCL Ear Institute), Christian Fullgrabe (UCL Ear Institute)

Open for UK home students only

Background

For children with unilateral hearing loss (UHL), hearing aid fitting for the poor ear is a common management strategy and there is some evidence that this is beneficial for sound localisation and quality of life (Briggs et al., 2011; Johnstone et al., 2010). Although hearing aid fittings for children with UHL are routinely verified using paediatric prescription formulae, there are no standardised outcome measures for validating these fittings. This means that audiologists are unable to determine whether hearing aid fitting is beneficial for an individual child and whether changes to hearing aid settings will result in improvement or detriment in hearing and quality of life.

This PhD will develop an evidence-based hearing aid fitting, validation and evaluation protocol for children with UHL. This protocol will be developed in partnership with end-users to ensure it can be implemented within audiology departments both in the UK and internationally.

Objectives and methods

1. Determine sensitive tools to assess hearing aid benefit for children with UHL We are currently conducting a systematic review of the literature to evaluate the evidence for measuring hearing aid outcome for children with UHL. The student will use this review as a basis for identifying potential speech tests and questionnaires to assess benefits in speech recognition and patient reported outcomes. They will:
    a. Evaluate potential speech tests at the UCL Ear Institute using test equipment available to a typical paediatric audiology clinic. Speech testing will initially be piloted on young adults with simulated UHL to compare a range of test types and parameter settings (e.g. speaker set-up etc) to identify those most sensitive to differences in performance. Potential measures will then be tested in controlled conditions with children with UHL.
    b. Examine the range of outcome measures identified in the systematic review. They will compare the properties and sensitivity of potential measures, across age ranges, setting-use, and person of completion (child, parent or teacher).
2. Develop a protocol that can be implemented into NHS audiology clinics We will use a person-based approach (Yardley et al., 2015) to design a protocol in partnership with clinicians, parents and children so it is likely to be used in clinical practice. The student will:
    a. Map patient pathways and availability of equipment, and conduct qualitative interviews with intended users to understand the issues around implementation.
    b. Use these findings alongside the data from objective 1 to develop the protocol and supporting resources.
3. Pilot the protocol in NHS clinics The protocol will then be evaluated in a clinical setting with children who are being fitted with hearing aids for UHL. This will take place at the Royal Berkshire NHS Foundation Trust and the University Hospitals Bristol and Weston NHS Foundation Trust. This will involve:
    a. Set up testing and collect data using the new protocol. We aim to recruit at least 50 children.

b. Conduct qualitative interviews with clinicians, parents and children to obtain feedback on using the protocol in practice.
c. Analyse data and feedback to refine the protocol.

Key requirements: The successful PhD candidate will be involved in planning of experiments, recruiting and testing participants, collecting and analysing data, reporting the results for publication and writing a thesis. The student will also be expected to act as a demonstrator for our degree programmes in Audiology for up to 180 hours a year. This will include helping to teach practical skills to audiology students on our undergraduate and post-graduate courses.

Candidates must have a first or upper-second class UK Bachelor's degree or a Master's degree in Audiology or a closely related field, or an overseas qualification of an equivalent standard from a recognised higher education institution. Both the project and the demonstrator role require clinical competence in adult audiology and therefore, current registration with RCCP, AHCS or HCPC is desirable. Experience in paediatric audiology is desirable but not required and any necessary training will be provided.

The PhD is available on a full-time or part-time basis.

To apply:

Please submit applications to Hannah Cooper (hannah.cooper@ucl.ac.uk) in the following format:

1. Your CV.
2. Personal statement (600 words maximum) outlining (i) why you are applying for this PhD, (ii) what makes you the ideal candidate, (iii) what experience you have had.
3. Name and contact details for 2-3 persons who could be approached as referees.

Informal inquiries can be directed to both Hannah Cooper and Amanda Hall (a.hall@aston.ac.uk). The **deadline for applications is Friday 26 September2022** with interviews taking place in early September 2022.

Impact

This project is aligned to the national study for hearing and will build important links with two audiology centres with research capability (Royal Berkshire NHS Foundation Trust and the University Hospitals Bristol and Weston NHS Foundation Trust), as well as with our partner hospital, the Royal National ENT and Eastman Dental Hospitals. By using a person-based approach to design, we will ensure that outputs are relevant to clinicians and service users, and that they are transferable to other audiology services both in the UK and internationally.

References

Briggs, L., Davidson, L. S., & Lieu, J. E. C. (2011). Outcomes of conventional amplification for pediatric unilateral hearing loss. *Annals of Otology, Rhinology and Laryngology*, *120*(7), 448–454. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3469201/pdf/nihms-410624.pdf%0Ahttp://www.scopus.com/inward/record.url?eid=2-s2.0-79960174875&partnerID=40&md5=05620b5380103964dd22dcd0d0f4583a

Johnstone, P. M., Nábělek, A. K., & Robertson, V. S. (2010). Sound localization acuity in children with unilateral hearing loss who wear a hearing aid in the impaired ear. *Journal of the American Academy of Audiology*, *21*(8), 522–534. https://doi.org/10.3766/jaaa.21.8.4

Yardley, L., Morrison, L., Bradbury, K., & Muller, I. (2015). The person-based approach to intervention development: Application to digital health-related behavior change interventions. *Journal of Medical*

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