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Thursday 10th September 2026

8.00-8.45: Registration/tea/coffee

8.45- 9.00: Welcome. Gaby Saunders

SESSION 1. CULTURE & GLOBAL HEARING CARE

9.00-10:00: Lauren Dillard (Invited). Not Just Hearing: How Culture and Lived Experience Shape Responses to Hearing Loss and Care.

10:00-10:20: Hearing aid adoption: the influence of language, culture, and hearing care infrastructure. Lena Wong

10:20-10:40: Factors influencing culturally responsive paediatric hearing care in England: an interview study with hearing care professionals and South Asian parents. Sathveeka Kasthurisamy Soundararajan

10.40-11.00: Evaluation of a Pilot Newborn Hearing Screening Programme in Addis Ababa, Ethiopia: A Mixed-Methods Study of Programme Performance, Costs, and Implementation Barriers. Essey Kiros

11.00- 11.30: Coffee break and networking

SESSION 2 - INCLUSIVITY AND LIVED EXPERIENCE

11.30-11.50: Childhood Deafness Research Network: Addressing research priorities in childhood deafness and hearing loss with inclusive Patient and Public Involvement. Anisa Visram

11.50-12.10: A quality-improvement project designed to enhance Audiology trainee's teaching capability through the integration of neurodiversity-inclusive tools. Ellie Brook

12.10-12.30: How reliable are hearing tests for people living with cognitive impairment? Jenna Littlejohn

12.30-12.50: Missing Voices: Socioeconomic Bias in Cochlear Implant Research. Helen Cullington

12.50-13.10: Can You See the Sound? Beyond Hearing: Exploring Deaf-Led Music Participation Through Visual and Embodied Approaches. Noa Nishizawa

13:10-14.15: Lunch – on your own

SESSION 3: THE PATIENT JOURNEY

14.15-15.15: Charlotte Vercammen (Invited). Shaping the Future of Audiology: State-of-the-art and Future Potential of Artificial Intelligence for Adult Hearing Care, and Need for Global & Diverse Datasets

15.15-15.35: Remote Audiology for Everyone? Validation and Lessons Learned for a Web-Based System for Cochlear Implant Research and Clinical Practice. Tobia Goehring

15.35-15.55: Where's the precision? A reconsideration of hearing healthcare pathways. Bill Whitmer

15.55-16.15: Investigating the impact of former contact sports participation on auditory function in older adults. Helen Nuttall

16.15-16.45: Tea break

16.45-17.45: Round table discussion with invited speakers and others. Moderator: Gaby Saunders

BREAK – put up posters

18:00-21:00: Poster session, networking, and dinner

Friday 11th September 2026

8.00-8.30: Registration/tea/coffee

SESSION 4: LANGUAGE AND AURAL DIVERISTY

8.30-9.30: Lauren Hadley (Invited). More Than Words: How Listener Characteristics Shape Speech Perception and Auditory Rehabilitation

9.30-9.50: Unraveling Listening Difficulties in Clinically Referred Children with Developmental Concerns: Contributions of Auditory, Cognitive, and Language Factors. Hanne Falcone

9.50-10.10: Impact of bilingual experience on speech-in-noise performance. Lindee Alvarez

10.10-10.30: Improving paediatric audiology clinical care for young neurodivergent children. Amber Roughley

10.30-11.00: Coffee break

SESSION 5: CLINICIAN-PATIENT-RESEARCHER PERSPECTIVES

11.00-11.20: Development of a Core Outcome Set for cochlear implant users: how patient values and clinician priorities diverge. Melanie Ferguson

11.20-11.40: Patients' experience of active transcutaneous bone conduction implants: a qualitative study highlighting gaps in clinician awareness. Emma Stapleton

11.40-11.50: Break and set up for panel discussion

11:50-13.00: Research inclusivity and engagement – a panel discussion with members of local communities. Moderator: Suhani Pattanshetti. Introduction Anisa Viram (10min) and Suhani Pattanshetti (10 min)

13.00-14.00: Lunch – on your own

SESSION 6: GENETICS AND GENE THERAPY

14.00-15.00: Kai Uus (Invited). Diverse Dimensions of Gene Therapy in Audiology: The Human Side of the Story.

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15.00-16.00: Discussion session – Bringing it all together – where next? Invited speakers and others. Moderator: Gaby Saunders

16.00-16.15: Conference close – Gaby Saunders

Scroll down for abstracts

Talks listed in order of presentation

Search by author name or title

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Thursday 10th September – Podium presentations

Not Just Hearing: How Culture and Lived Experience Shape Responses to Hearing Loss and Care. *Invited Speaker: Lauren K Dillard*

Hearing loss is a common condition among aging adults with wide-ranging impacts on health and well-being. While the distribution and impacts of hearing loss have been relatively well characterized among some populations, there is little known about the hearing-related differences that may exist among specific population groups, including those that can be proxied by sociodemographic characteristics (e.g., sex, race, socioeconomic position). These health disparities exist within and across countries and can exist across the continuum of hearing health. That is, these health disparities can relate to the onset of hearing loss, its impacts, and access to and use of hearing health care. In this talk, the speaker will draw on her research conducted in diverse cohort studies of the general population, as well as a recent scoping review related to the perceptions of hearing loss among the general public, to discuss how different lived experiences may influence the following: (1) the onset of hearing loss, including exposures to risk factors for hearing loss, (2) perceived or reported hearing difficulties and their relationship with audiometric hearing, (3) the impacts of hearing loss on general health, and (4) the access to and use of hearing health care. Lastly, the speaker will discuss some current evidence-based strategies that aim to address these health disparities.

Hearing aid adoption: the influence of language, culture, and hearing care infrastructure. *Lena Wong*

It's not uncommon for a Chinese patient to have a 35 dB HL hearing loss but deny having communication problems and a 50 dB HL hearing loss but do not want hearing aids. To effectively work with patients from multicultural background, we need to understand what would concern them the most and how best to address their needs. This presentation will cover results from a range of studies conducted in the past 30 years that examined speech perception, self-perceived hearing and hearing needs and dispensing practice in China, and help the audience understand how culture and healthcare infrastructure issues could potentially influence Chinese immigrants' hearing aid uptake.

Methods: Research findings involving 90,000 stakeholders (i.e., patients, family members and dispensers) from experimental studies, focus group interviews, questionnaires and manufacturer database will be reviewed and summarized. We aim to identity (1) demographics and hearing profile of hearing aid users, (2) language-based characteristics that could affect speech perception, (3) self-perceived hearing, and (4) other factors that could affect the uptake of hearing loss. The information will be summarized, integrated and applications of these findings in clinical situations will be presented.

Results: While the acoustic characteristics of a tonal language may offer advantages in speech perception in the presence of noise, lower education and health literacy may prevent them from having adequate insight to their hearing problems. Culture also drives different help-seeking behavior. While it is important that the family is involved in the process, communication and relationships in the extended family should also be accounted for. Finally, although hearing aid dispenser practice in mainland China does not directly influence the kind of hearing care immigrants receive, outcomes from hearing aid fitting as experienced by their families in the homeland could shape the expectations and decision-making in hearing aid uptake.

Conclusion: Given many Chinese older adults living in western societies are immigrants and possess similar characteristics as those in their homeland, clinicians working with this population should be aware of how these factors influence hearing care.

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Factors influencing culturally responsive paediatric hearing care in England: an interview study with hearing care professionals and South Asian parents.
Sathveeka Kasthurisamy Soundararajan

Permanent childhood hearing loss affects nearly 2 out of 1000 children at birth in the UK, and if untreated, limits spoken language development. Early identification and intervention can significantly improve speech, language, and auditory outcomes. In England, children from South Asian communities (particularly Pakistani and Bangladeshi, followed by Indian) are at higher risk of hearing loss. However, there is limited research exploring whether hearing care services are culturally responsive to the needs of these families. This project explores barriers and facilitators to hearing care professionals providing culturally responsive services and South Asian parents'/carers' access to and engagement with hearing care services.

Methodology. Semi-structured interviews were conducted with hearing care professionals (paediatric audiologists, heads of services, and teachers of the Deaf) and South Asian parents of Deaf children. The interview guide used the Capabilities, Opportunities, and Motivations model of Behaviour change as a theoretical framework. Patient and public involvement informed the lay language recruitment materials and interview guides. Interpreters were provided to parents on request. Transcripts were first coded inductively using Gale et al.'s framework method to identify themes and then deductively using the Theoretical Domains Framework. Reflexive journal entries by the primary researcher enabled critical examination of positionality, co-construction of data meaning, and deeper understanding of the complexity of issues.

Results. Barriers and facilitators influencing professionals' provision of culturally responsive hearing care included three overarching themes. The first highlighted structural and organisational factors influencing culturally responsive care, including limited access to interpreters, time and workload pressures, and clinical and workforce resources. The second highlighted compensatory and collaborative practices of professionals to overcome systemic barriers, including flexible appointment scheduling, adaptive communication strategies, and multidisciplinary teamwork as key facilitators. The third theme captured the influence of professional identity, knowledge, and assumptions, where limited formal training acted as a barrier, whereas experiential learning, reflective practice, and positive professional attitude acted as facilitators shaping culturally responsive care.

For South Asian parents, factors affecting access to and engagement with hearing services included knowledge, community and family support, geographical location, frequent hospital visits, communication gaps, language support, commitment to the child's wellbeing, and emotional distress.

The analysis highlights that providing culturally responsive hearing care depends on interconnected professional, organisational, and cultural factors. Results suggest that improving practice requires system-level changes alongside professional development, rather than solely relying on one-off professional trainings on cultural competency. Supporting professionals to adopt culturally responsive practice also requires fostering cultural humility through reflection.

Conclusion. Culturally responsive hearing care is shaped by complex and interwoven factors. The factors can be mapped to the Behaviour Change Wheel to inform targeted interventions. Findings suggest that hearing services are often perceived as more authoritative or clinician-led rather than family-led. Meanwhile, cultural responsiveness extends beyond family-led care to developing empathy, interpersonal and communication skills, and challenging prejudice and

discrimination. Achieving cultural responsiveness would enable professionals to move beyond idealised ‘best-case’ service delivery to family-led culturally responsive service delivery.

Evaluation of a Pilot Newborn Hearing Screening Programme in Addis Ababa, Ethiopia: A Mixed-Methods Study of Programme Performance, Costs, and Implementation Barriers. *Essey Kiros*

Newborn hearing screening (NHS) is established practice in high-income countries but remains largely absent across sub-Saharan Africa. Ethiopia, Africa's second most populous country, has no national NHS programme despite emerging evidence of a high underlying burden of childhood hearing loss. Between 2024 and 2025, a pilot NHS programme operated across four hospitals in Addis Ababa, supported by Hearing for Ethiopia, MED-EL and PATH MEDICAL. The programme has since stopped, and no evaluation of its performance, cost, or implementation has previously been published.

Aim: To evaluate the Addis Ababa pilot NHS programme across three dimensions: programme performance, cost, and implementation barriers.

Methods: This mixed-methods study comprised three components. Component 1 assessed programme performance against Joint Committee on Infant Hearing (JCIH) benchmarks using anonymised programme outcome data. Component 2 conducted a cost analysis adapting the methodology developed by Bamford et al. (2004) for the UK Newborn Hearing Screening Programme, using programme financial records. Component 3 employed Interpretative Phenomenological Analysis to explore the experiences of professionals and parents involved in the pilot, through semi-structured interviews.

Results: Of 4,344 births recorded across four hospitals, 778 infants (17.9%) were screened. Primary referral rate was 35.9% and loss to follow-up was 56.6%, both well outside JCIH benchmarks. No confirmed cases of permanent hearing loss were identified; this was attributed to low coverage and high loss to follow-up rather than absence of underlying disease burden. Preliminary cost analysis indicates a total programme cost in the order of USD 20,000–25,000, equivalent to approximately USD 25–30 per infant screened; final figures are being confirmed. Sensitivity analysis suggests that cost per infant would fall substantially at higher coverage levels, approaching figures comparable to published Nigerian programme costs. Qualitative findings on the experiences of professionals and parents, and the factors influencing programme implementation and discontinuation, will be presented and discussed.

Conclusion: This study provides the first published evaluation of a newborn hearing screening pilot in Ethiopia and the first cost analysis from a low-income sub-Saharan African setting. Findings indicate that the programme's cost structure was viable but constrained by low coverage, and identify barriers relevant to the design of future newborn hearing screening initiatives in similarly resourced settings.

Childhood Deafness Research Network: Addressing research priorities in childhood deafness and hearing loss with inclusive Patient and Public Involvement. *Anisa Visram*

Introduction and methods. In 2025 our group completed a priority setting partnership (PSP), using the James Lind Alliance (JLA) framework to define the top 10 research priorities around childhood deafness, according to both adult stakeholders and deaf children. A number of engagement methods were used to ensure wide and diverse representation in the process. Ongoing monitoring of contributor demographics was used to direct promotional activities

towards less well-represented groups. Adaptations to JLA methods were used to successfully represent children's voices in the PSP. The Childhood Deafness Research Network is the legacy group from the PSP, that promotes the research priorities and supports the development of research projects to address them.

Results. The identified research priorities spanned a range of domains including education, communication, wellbeing, audiology/medical, interventions and outcomes, and services. The project successfully engaged a range of parents, professionals, children and young people from diverse geographies and backgrounds. Ongoing monitoring of demographic data helped reduce overall inequalities in representation. However, there were still challenges in reaching certain groups, in particular men and young people. The Childhood Deafness Research Network is now established, comprising a mix of professional and lived experience members, most of whom were involved in various stages of the PSP. It hence forms a broad and diverse group of stakeholders that have successfully contributed as a group to project and policy development initiatives related to childhood deafness research priorities.

Discussion. Adapted methods allowing full participation of children in the PSP were successful, innovative, and highly valued by stakeholders throughout the process. Ongoing monitoring of demographic data of contributors helped to identify communities for whom participation or involvement was less inclusive, allowing targeted promotion to address barriers. The Childhood Deafness Research Network comprises professional and lived-experience members, with a self-defined remit to promote research that addresses the identified priorities. The group has supported development and carrying out of research with (i) Patient and Public Involvement contributions and (ii) offering professional expertise, as well as getting involved in relevant policy development. Achievements of the group in its first months include: winning a tender from NDCS to complete a scoping review on childhood deafness and additional needs, submitting a comprehensive group response to the government's recent consultation on special educational needs, widespread promotion of the identified research priorities in varied professional and non-professional spheres, and patient and public involvement contribution to a number of research proposals and active projects. You can learn more and get involved at: https://childdeafnessresearch.co.uk/.

A quality-improvement project designed to enhance Audiology trainee's teaching capability through the integration of neurodiversity-inclusive tools. *Ellie Brook*

The Kingdon Review and the Paediatric Hearing Service Improvement identified quality issues in Audiology relating to: workforce capacity and capability, including training underinvestment and clinical supervision. It demanded essential change in Practice Education (PE) in relation to educational restructuring. Effective inclusive clinical supervision is known to improve staff retention, patient flow, and reduce healthcare professionals' burnout. Within Oxford University Hospitals (OUH), Audiology currently has 1.0 full-time PE, and demand exceeds capacity to train. Reduced capacity limits opportunities for simulations, planning time and supervision quality, impacting 'growing and developing' the workforce, critical for staff retention. Neurodiversity affects 1 in 5 people; it is essential to incorporate diverse Neurodiversity-inclusive adjustments to ensure education is accessible.

Clinical Learning in Practice (CLiP), a flipped model of teaching where students are utilised in peer teaching, can be an effective tool to increase teaching capability and capacity to train, reducing power imbalance perceived by trainees and educators. To address this, a quality improvement (QI) project aimed to increase trainee confidence in teaching, strengthen feedback skills and foster the application of teaching models in Audiology practice. Seven key stakeholders were identified, including trainees, Audiology staff, management, the Trust PE team and NHS England. Stakeholders were mapped in four stages: Identify, Prioritise,

Understand and Engage, ensuring management and trainees were at the centre to collaborate and develop training design from feedback, and powerful stakeholders were updated on project implementation.

Using the Model of Improvement, small, measurable changes were tested through PDSA cycles. The first cycle was access to Trust e-learning materials for new educators. Trainees felt the materials were not relevant to Audiology as they were Nursing-led and lacked real-life skill application. However, Neurodiversity content was highly valued. In response, a two-hour Audiology-focused teaching session was designed, applying teaching models and simulating feedback and coaching skills with a diversity of learning styles incorporated. Trainees reported improved relevance, though confidence improvement varied, depending on teaching experience.

PDSA cycle 3 involved students designing and delivering an ear mould tutorial with a hybrid simulation, with limited support from the PE. Each student was assigned a different component reflective of Kolb's Learning Cycle, collaboration involved Kotte's change and a Community of Practice approach. Teaching was peer-reviewed by PEs, and 360-degree feedback was collected via MURAL (trainees, junior members of staff, external assessor, PEs). Thematic analysis mapped observed skills to the Professional Standard Framework. An external teaching certified psychologist independently validated the mapping, identifying additional domains and resolving discrepancies. Students valued two scientist-focused tutorials with accessibility advice and PE support as the key effective PDSA cycle approaches.

Collaboratively, trainees met the Associate Teaching Fellow Standards. Action in Learning Sets could build on the trainees' diverse strengths and sustain teaching capability. Trainees referenced burnout if they had sole responsibility for training and applied accessible simulations. Burnout could be measured by change in sickness rates, and staff burnout reports are 31.4% Nationally. Future work includes exploring educator burnout nationally, strengthening relationships with the Trust PE team and disseminating findings to NHS England and Higher Education to develop the MSc curriculum, which would then reform the workforce for Education.

How reliable are hearing tests for people living with cognitive impairment? *Jenna Littlejohn*

Background: Hearing impairment is increasingly recognised as a potentially modifiable risk factor for dementia and a potential biomarker of neurodegenerative disease. Large-scale studies investigating auditory biomarkers in Alzheimer's disease (AD) rely on accurate and reliable hearing assessments; however, cognitive impairment may affect participants' ability to engage with audiological testing, potentially influencing data quality and interpretation. Understanding the feasibility and reliability of commonly used behavioural and objective hearing measures in this population is therefore essential.

Methods: Participants were recruited as part of the ongoing Auditory Biomarkers of Healthy Ageing and Alzheimer's Disease study. Individuals with clinically diagnosed AD (at the Mild Cognitive Impairment stage) and cognitively healthy older adults underwent a comprehensive assessment of hearing, listening, and cognition. Audiological measures included pure-tone audiometry (0.25–8 kHz), extended high-frequency audiometry (up to 16 kHz), distortion product otoacoustic emissions (DPOAEs), and auditory steady-state response (ASSR) threshold estimation at 40 and 90 Hz.

To evaluate test reliability and feasibility, outcomes will include test completion rates, proportion of valid threshold estimates obtained, testing time, requirement for repeated instructions or additional support, and rates of unusable or incomplete datasets. Reliability

indicators will be compared between participants with AD and cognitively healthy controls. Associations between cognitive performance and audiological test completion or data quality will also be explored. Particular attention will be given to differences between behavioural measures, which require active participant responses, and objective measures, which are less dependent on cognitive processes.

Results: Data collection is currently ongoing. Analyses will compare the reliability and feasibility of behavioural and objective audiological measures between groups and identify factors associated with successful test completion and high-quality data acquisition.

Conclusions: This study will provide key evidence regarding the suitability of commonly used hearing assessments in individuals with cognitive impairment. The findings will inform the selection of auditory outcome measures for studies investigating hearing as a biomarker of healthy ageing and AD and may guide the development of testing protocols that maximise data quality in cognitively impaired populations.

Missing Voices: Socioeconomic Bias in Cochlear Implant Research. *Helen Cullington*

Background. Participation in clinical research is generally a positive experience for patients and families and improves the performance of healthcare organisations. People taking part in clinical research should reflect the population of those with the health condition. However, clinical trials often face barriers recruiting people from ethnic minority backgrounds or deprived areas.

The United Kingdom (UK) BEARS Virtual Reality clinical trial recruits children aged 8 to 16 with bilateral cochlear implants and their families. We wanted to improve its quality, value and reach by exploring and enhancing recruitment diversity asking:

1. What is the sociodemographic profile of children aged 8 to 16 years with bilateral cochlear implants in the UK?
2. What are the sociodemographic characteristics of the families recruited to BEARS

Currently we do not know the sociodemographic profile of children with implants in the UK, or indeed deaf children. We cannot assume that deaf children have the same characteristics as the general UK paediatric population; we cannot assume there are not social disparities in access to bilateral cochlear implants.

Methods. We conducted a scoping review to assess the available literature. All UK paediatric cochlear implant centres were asked to share deidentified sociodemographic data. We compared this with data from the first 6 months of the BEARS trial recruitment.

Results. Data were provided on 2365 children with bilateral cochlear implants aged 8 to 16 years - from 14 of the 17 UK paediatric centres. Overall children with bilateral implants were from significantly more deprived backgrounds than the UK population - varying greatly between centres as expected. Ethnicity of children with implants in the UK was also different from the general population – with significantly less children identifying as white. Thirty-five languages other than English were listed as home language. Children recruited to the BEARS trial however were from significantly less deprived backgrounds than the UK population.

Conclusions. We hope that our emphasis on research recruitment inclusivity will help the BEARS clinical trial and future cochlear implant studies. Collection of sociodemographic data in The National Registry of Hearing Implants will support better monitoring and more representative research in the future.

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Can You See the Sound? Beyond Hearing: Exploring Deaf-Led Music Participation Through Visual and Embodied Approaches. *Noa Nishizawa*

Music participation is often assumed to depend primarily on hearing, creating barriers for Deaf and hard-of-hearing people whose experiences of music may extend beyond auditory perception alone. While accessibility initiatives frequently focus on accommodating Deaf individuals within existing musical structures, fewer approaches explore how music-making itself can be reimagined through Deaf perspectives and multisensory design.

This presentation reports on *See the Sound! Play the Music!*, a Deaf-led music workshop delivered at Manchester Deaf Centre as part of the wider *Can You See the Sound?* project, supported by the RNCM Creative Innovator Award 2025 and Yamaha Entrepreneurship Award. The workshop was designed and facilitated by a profoundly Deaf musician and researcher and aimed to explore alternative pathways into music participation through visual communication, movement, vibration, body percussion, and collaborative music-making using acoustic instruments.

Participants included Deaf and hard-of-hearing adults with varied musical backgrounds, including individuals with little or no previous experience of music-making. The workshop combined large-group body percussion activities with small-group composition and performance tasks. Qualitative evidence was collected through participant feedback, staff reflections, facilitator observations, and reflective practice documentation.

Findings indicated increased confidence, engagement, and participation throughout the workshop. Participants reported that visual communication systems, embodied rhythm activities, and vibration-based experiences made musical concepts more accessible and easier to understand. Several participants described previous exclusion from music education due to reliance on auditory instruction, while staff reflections highlighted the value of Deaf-led facilitation and visual approaches to learning. Feedback included comments such as “I could feel the vibration through my heart” and requests for future workshops.

The project suggests that multisensory and visually led approaches may provide meaningful alternatives to traditional auditory-centred models of music participation. Rather than functioning solely as accessibility accommodations, these approaches may expand opportunities for engagement, confidence, wellbeing, and creative expression within Deaf and hard-of-hearing communities. More broadly, the study highlights the importance of lived experience and disabled leadership in the design of inclusive cultural and educational practices, offering implications for audiology, rehabilitation, community engagement, and accessibility-focused interventions.

Shaping the Future of Audiology: State-of-the-art and Future Potential of Artificial Intelligence for Adult Hearing Care, and Need for Global & Diverse Datasets. *Invited speaker: Charlotte Vercammen*

Health is a fundamental human right and health care systems play a pivotal role in achieving societal well-being. The sobering reality is that these systems are under pressure. This is true for hearing care as well. Hearing loss management is effective, but adoption is low (< 20% globally) – even in high-income regions where hearing care is accessible. Audiology services are generally scarce in low and middle-income countries – regions that will be disproportionally affected by an increased demand in hearing care. Artificial Intelligence (AI) has the potential to address some of these challenges, by automating tasks and freeing up clinicians’ time, accelerating advances in diagnostics and hearing technology, or by triaging individuals seeking

hearing care into service trajectories tailored to their risk profiles, needs, and local infrastructure.

This talk will explore the state-of-the-art and future potential of AI for the sequence of interactions between patients and their families, and health care systems and providers ("patient journey"). Discussions that took place at a Foundation Pour L'Audition workshop in November 2025 – attended by experts in audiology and AI – will be consolidated and expanded upon. A central focus will be the boundaries for appropriate use of AI in healthcare and the need for diverse, global datasets and international collaboration to shape the future of audiology. Healthcare and reimbursement systems differ widely across countries, and diverse cultural, economic, and political factors influence access to hearing rehabilitation, and, consequently, the data we have available today. We will illustrate challenges observed in AI across medical fields and what we can do to move towards equitable AI in audiology.

Remote Audiology for Everyone? Validation and Lessons Learned for a Web-Based System for Cochlear Implant Research and Clinical Practice. *Tobias Goehring*

Web applications are increasingly used in auditory research and clinical audiology, driven by the development of mobile, remote technology and strong demand. Remote applications have potential to increase statistical power, accessibility and diversity in research and to support clinical audiology services and patient care. We aimed to bring these advantages to cochlear implant (CI) research and clinical practice and developed a web-based listening test system called AUDITO. Building on wireless streaming technology and smart devices, AUDITO can be used to flexibly implement and administer a wide range of listening tests remotely or in-the-lab. The system was designed to be easy to use without software programming and to be device agnostic. Experimenters can exchange test setups and stimuli sets within the system to facilitate collaboration. Technical checks were implemented to ensure signal quality over wireless streaming. A first validation study for CI research was performed with 20 experienced CI listeners. Comparisons of interest included the presentation of stimuli via audio cable vs Bluetooth streaming, and remotely vs in-the-lab. Three listening tests were implemented to measure speech perception, digits in noise and spectro-temporal resolution. A questionnaire was administered to collect user feedback. The system worked reliably with various setups including desktop and laptop computers, tablets and smartphones. Test results were consistent between listening modalities across conditions confirming the validity of AUDITO for research applications. User feedback was positive for system usability and function, while acoustic quality was not reported to be compromised via streaming. A second clinical evaluation study is ongoing with a group of CI patients. Clinical auditory tests were implemented in close collaboration with a UK CI clinic and a questionnaire was designed. Preliminary findings show mixed results and some disagreement between in-clinic and at-home test scores especially for the speech-in-noise tests. Questionnaire responses were again highly positive overall. The AUDITO system facilitates data collection, enables research collaboration, and has potential to support clinical audiology to improve accessibility, inclusion and to save resources. Technical and psychological aspects still need to be addressed before the system can be used to support clinical practice. Findings and lessons learned will be presented for remote audiology overall and the improvement of remote testing systems to make them suitable and beneficial for clinical application in future.

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Where's the precision? A reconsideration of hearing healthcare pathways. *Bill Whitmer*

In audiological services, audiometry and hearing-aid fitting are generally considered the two pillars - the assessment and the intervention – of hearing healthcare. And the majority of clinical time is spent on these two processes. But do these current processes, considered good practice, represent good care? And in practice, do these two processes actually represent precision medicine? We propose a shift away from an intensive initial provision towards an ongoing care model incorporating past and recent evidence and tool development from remote and over-the-counter delivery models that acknowledges the imprecision in practice. The guiding principles of the proposed pathway are (a) identifying those better served by different pathways, (b) promote branching at each step in the patient's journey based on outcomes, and (c) making in-person time commensurate with need. Possibly the greatest challenge to an alternate hearing care pathway is the first step: identifying symptoms requiring greater and/or immediate treatment. If that challenge can be overcome, the rest of the pathway can generally be sorted through a series of much less clinic-intensive steps that focus on follow-through management. The subsequent steps address if and what kind of further involvement is needed, from self-management to hearing-aid delivery to possible subsequent training to in-person visit(s). The goal in reconsidering the current pathway is not to immediately replace it, but to call into question the strength of these pillars, and where there are weaknesses – assumptions and knowledge gaps in how we can provide efficient and effective hearing care.

Investigating the impact of former contact sports participation on auditory function in older adults. *Helen Nuttall*

Data suggest that contact sports athletes report auditory symptoms following concussive head impacts, but auditory function is overlooked in sport and not routinely tested or monitored in this population. We have established that sports-related head impacts in younger adult contact sports athletes are associated with disrupted auditory cortical responses (Andrew et al., 2026). It is unclear, however, whether such auditory disruption persists into later life. This study investigated if sports-related head impacts affect auditory function in older adults who were formerly engaged in contact sports.

Data were collected from former contact (n=19) and control (n=16) participants, who were recreationally active (data are preliminary from an overall planned sample of 70). Participants were matched across cognitive status and average pure-tone audiometry thresholds. Auditory N100 event-related responses to /da/ in quiet and multi-talker babble conditions were recorded, as well as the signal-to-noise ratio (SNR) associated with participants' 80%, 50%, and 20% accuracy performance points during a sentence-in-noise task. Parietal alpha power was also measured during the sentence task to index listening effort.

For N100 data, condition was significant ($F(1,32) = 25.86$, $p < .001$), with reduced N100 amplitudes in background noise compared to quiet. Neither group nor the interaction were significant. For the behavioural data, group was significant ($F(1, 33) = 5.30$, $p = .028$), as well as condition, ($F(2, 66) = 788.93$, $p< .001$, and the interaction ($F(2, 66) = 8.79$, $p <.001$). The interaction reflected that the contact group required a more favourable signal-to-noise ratio to achieve 80% and 50% accuracy, relative to controls. Alpha power analyses revealed no significant findings at this stage.

These preliminary findings suggest that understanding speech in background noise is more challenging for former contact sports athletes relative to older adult control participants and is likely not attributable to peripheral hearing status. Neural data are underpowered at this stage, and further data collection is ongoing with results to be discussed. Together with our data on

younger adult contact sport athletes, these observations indicate that head impacts related to participation in contact sports may disrupt transient and longer-term central auditory function, and there may be a need for greater audiological support for this overlooked population.

Friday 11th September – Podium presentations

More Than Words: How Listener Characteristics Shape Speech Perception and Auditory Rehabilitation. *Invited speaker: Lauren Hadley*

Speech perception is almost inconceivably complex. While driven by the acoustic signal, it is shaped by an individual listener's capabilities, experience, expectations, and goals. Characteristics beyond hearing acuity have historically been overlooked during auditory assessment and intervention, yet recent steps towards individualised hearing healthcare bring their importance to the fore.

In this talk, I will address four categories of characteristics likely to affect speech perception: (1) listener capabilities such as cognitive skills, (2) listener experience based on age or language proficiency, (3) listener expectations at the conversation- or sentence-level, and (4) listener goals within the listening situation. I will summarise how these characteristics impact intelligibility and listening effort, as well as presenting my own findings on how they impact a listener's ability to stay on the front foot. Importantly, while some of these topics have attracted a range of research that is relevant for personalised rehabilitation (e.g., how cognitive skills affect intervention benefit), others remain underexplored (e.g., how expectations/goals could be accounted for in an intervention). Finally, I consider what we know of how these listener characteristics affect conversation behaviour, to move towards the goal of identifying how to best support listeners in everyday life.

Unraveling Listening Difficulties in Clinically Referred Children with Developmental Concerns: Contributions of Auditory, Cognitive, and Language Factors. *Hanne Falcone*

Listening difficulties (LiD) are recognized as a multidimensional problem, involving not only bottom-up auditory but also top-down cognitive and language-related mechanisms. Children with LiD often experience difficulties in complex listening situations despite normal hearing sensitivity. LiD frequently co-occur with neurodevelopmental conditions, including developmental language disorder (DLD), attention-deficit/hyperactivity disorder (ADHD), learning disorders (LD), and autism spectrum disorder (ASD), with considerable overlap in behavioral profiles. However, the underlying individual causes of LiD remain insufficiently understood, particularly in heterogeneous clinical populations. For personalized care, there is a need to better understand how auditory, cognitive, and language factors jointly contribute to LiD.

This study aims to investigate how LiD manifests in a heterogeneous clinical sample of children who are referred with neurodevelopmental concerns. Specifically, we examined whether children with caregiver-reported LiD differ from typically developing (TD) age-matched peers across a range of behavioral tasks, and whether performance on these tasks relates to caregiver-reported LiD.

Data included children with (suspected) DLD, ASD, ADHD, or LD and comprised of more than 90 clinically referred children and more than 200 age-matched TD peers (6;0–13;11 years), all with normal peripheral hearing and IQ ≥ 70. Caregiver-reported LiD were assessed using the

validated Evaluation of Children's Listening and Processing Skills (ECLiPS), with children scoring below the 10th percentile classified as having LiD (n ≥ 50). Participants completed a range of tasks targeting auditory processing (e.g., temporal processing) and higher-order functions (e.g., language comprehension and executive control).

Clinically referred children with LiD performed more poorly than TD peers on tasks requiring linguistic and higher-order processing, including phonological short-term memory, sentence intelligibility in noise, prosodic processing, and spoken language comprehension, as well as on a measure of temporal auditory processing. In contrast, no group differences were observed for less language-dependent tasks, such as digit triplet recognition in noise and non-linguistic rhythmic processing, nor for inhibitory control. This pattern suggests that LiD may not primarily reflect deficits in basic auditory processing but rather emerge in contexts requiring greater linguistic integration. Developmental trajectories were largely comparable across groups, with similar age-related improvements across most tasks and no consistent effects of gender.

Associations with caregiver-reported LiD were primarily observed between language-based tasks and the ECLiPS subscale capturing the use of lexical, syntactic, and contextual information to interpret speech. While multiple associations were observed, only the understanding of meaningful sentences in noise and prosodic processing remained significant after correction for multiple comparisons. Further analyses are ongoing to examine how these patterns may vary across developmental profiles and comorbidities, with data collection still in progress and additional data to be presented at the conference.

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Impact of bilingual experience on speech-in-noise performance. *Lindee Alvarez*

Language concordant care is the most facilitative clinical care model for patients, but few bilingual audiologists working within the United States makes language concordant care inaccessible for many patients. Millions of native Spanish speakers currently reside within the United States which underscores the need for clinically relevant research concerning bilingual Spanish-English speakers. Bilingual individuals are a heterogenous group, and their language history background has important implications for their ability to process linguistically complex content auditorily. Speech presented in competing speech is a linguistically and cognitively demanding task. The difficulty of this task is compounded by the linguistic and auditory profiles of the individual.

The present research sought to evaluate language history in conjunction with speech in noise performance in a cohort of individuals without hearing loss. All participants were required to be native Spanish speakers. Participants were allowed to enroll in the study if they were sequential bilinguals or if they were simultaneous bilinguals. In the case of sequential bilinguals, they were required to have a minimum of 5 years of experience speaking, reading, and writing in English. Adults between the ages of 18-80 who met the language and hearing criteria were included in the study.

To evaluate their language background, participants completed the Bilingual Language Profile, BLP, questionnaire which contains 19 questions related to language history, language use, language proficiency, and language attitudes. Participants' answers to the questions resulted in a final dominance index between -218 and +218. Scores approaching zero indicated

balanced bilingualism, positive scores indicated English dominance, and negative scores indicated Spanish dominance.

To evaluate their speech in noise performance, the AzBio sentences in Spanish and English were utilized. The sentences were presented within four-person multi talker babble. The level of sentences was kept constant at 60 dB HL. The sentences were presented at up to three different signal-to-noise ratios (SNRs) between + 5 dB SNR and -5 dB SNR. Testing was completed once the participant scored 50% or less on a list of sentences.

Every attempt was made to recruit an equal number of Spanish dominant and English dominant individuals as evidenced by their dominance index on the BLP. Only 36% of the sample was Spanish-dominant with 64% being English-dominant.

The results of the study indicated significant differences in performance for the +5 dB and -5dB SNR conditions. On average, performance declined by about 20% from +5 dB to 0 dB SNR and over 40% from 0 dB to -5dB SNR. This finding suggests that regardless of the language, individuals experience a steep decline in speech understanding once they are required to listen in an unfavorable listening condition. Moreover, the language history assessment revealed that individuals living within the Dallas-Fort Worth metroplex have varied language histories which is a crucial point of consideration during clinical encounters necessitating linguistically complex stimuli. Future research will focus on the impact of language background on speech in noise performance in a cohort of individuals with hearing loss.

Improving paediatric audiology clinical care for young neurodivergent children.
Amber Roughley

Introduction: Paediatric audiologists have been reporting a rise in 'tricky to test' children in their clinics. Often these children will go on to receive an autism or other neurodivergent diagnoses, and so we are referring to this population as neurodivergent young children. These children are usually referred due to speech or communication concerns, to 'rule out' a hearing loss as a cause. They often require multiple appointments, sometimes using adapted testing methods, for example the use of frequency filtered musical stimuli. Some clinics have reported that they have stopped accepting referrals for children with no specific hearing concern, despite there being no published guidance or data indicating who should be seen and how many cases of hearing loss this may miss. Our research team aim to improve audiological referral pathways and testing methods for neurodivergent children, including facilitating the standardisation of testing using filtered musical stimuli.

What we have done so far:

- We have spoken to a number of paediatric audiologists in order to understand the challenges they are facing with this population.
- We conducted a study comparing minimum response levels (MRLs) obtained using warble tones and music. In this study, we used a standardised process in which the musical stimuli were filtered to within a 3rd octave frequency band and their dynamic range was controlled.
    - MRLs obtained using our filtered musical stimuli are satisfactorily similar to MRLs obtained by standard warble tone for typically developing young children seen in our lab.
- We have shared our filtered musical stimuli with some NHS audiology departments and asked them to audit how they use these sounds, and to record thresholds obtained using the musical stimuli as well as thresholds using standard testing.

    - The signals have been used with a range of young children and have often elicited responses at low levels, often accompanied by other standard assessments, such as otoacoustic emission (OAE) tests and behavioural testing with standard stimuli.
- We carried out a multi-site audit looking at outcomes and testing methods for children up to 4 years old referred to audiology clinics for speech and/or
    - Around 15% of children in the audit were identified as having a hearing loss (permanent or temporary). Of these:
        - Almost half required management for their hearing loss.
        - Almost half had no parental hearing concern reported.
    - A third of all children, and around 50% of those aged 30+ months, required 'adapted testing'.

Discussion and future research: It is clear that clinics need better tools and guidance to manage the increasing numbers of neurodivergent children in the clinic. Using frequency filtered musical signals may be a useful tool for neurodivergent children, however we hope to help develop clear national guidance on their use. Our future research will focus on how we can better triage referrals for neurodivergent children and how we can improve the experience for those who do need to attend clinic, for example by adapting the clinical environment and developing new tests.

Development of a Core Outcome Set for cochlear implant users: how patient values and clinician priorities diverge. *Melanie Ferguson*

Background. Remote technologies for cochlear implant (CI) services have the potential to facilitate improvements in personalisation, efficiency, effectiveness, and equity of CI services. Relevant and sensitive outcome measures that evaluate CI services delivered via remote technologies allow stakeholders to make informed decisions about the best methods of patient care.

The overall aim was to develop a core outcome set (COS) to evaluate remote technologies used to deliver CI services. There were three specific objectives:

1. Synthesise existing evidence on remote technologies and associated outcome measures for adults receiving CI services.
2. Identify a core outcome domain set (CODS).
3. Identify and agree on outcome measures to form the COS.

Methods. Population: Adult CI users and CI professionals Australia, the UK and the USA.

Phase 1: Systematic review, and online workshops (n=3) with key stakeholders (CI users, CI professionals) identified core outcome domains.

Phase 2: Two three-round parallel online Delphi reviews were conducted for CI users, and CI professionals, separately. These comprised statements about outcome domains of potential importance to CI outcomes, rated on a 5-point Likert scale from 'extremely important' to 'not important'. Consensus was set a priori at ≥80%. N=114 adult CI users and N=74 CI clinicians and professionals completed round 1.

Phase 3: An online survey of Australian clinical CI audiologists identified core outcome measures specific to the CODS. Audiologists indicated their awareness, use of, and perceived value, of each of the proposed outcome measures.

Results. Phase 1: Nine core areas (e.g. Physiological and Clinical; Emotional Wellbeing; Delivery of care; Adverse Events) were identified, with 58 outcome domains.

Phase 2: Domains were grouped into three supra-domains; Service, Clinical and Self-Report.

- For Service, agreement was reached across both groups for the top three domains, which were Reliability, Usability, and Accessibility.
- For Clinical, Speech Discrimination was the only domain within the top three for both participant groups. Speech Recognition in Noise and in Quiet were identified as important for CI users, and Device Integrity and Device Use for CI professionals.
- For Self-report, there was no between-group agreement, with many domains ranked highly by CI users ranked far less important by professionals.

Phase 3: Adaptive speech in noise testing should be prioritised to avoid ceiling effects and to minimise the number of speech tests. Self-report measures of hearing-related quality of life, satisfaction and mental health and wellbeing are all important domains.

Conclusions. A pragmatic interim COS was developed. Outcome domains ranked as important to CI users and CI clinicians often do not align. Therefore, input from both CI users and CI clinicians is essential. A shared understanding between both stakeholder groups is important to minimise these differences.

As experienced CI clinicians tend to default to a small set of traditionally used tests, we recommend ongoing monitoring of opinions and practices of CI clinicians. Outcome measures important for remote services are similarly important for in-person services.

There is a need for well-developed, validated and trusted outcome measures for many domains that are important for both CI patients and clinicians.

Patients' experience of active transcutaneous bone conduction implants: a qualitative study highlighting gaps in clinician awareness. *Emma Stapleton*

Objective: To explore adult patients' experience of active transcutaneous hearing implants and identify factors influencing outcomes and access to care.

Methods: A qualitative study was conducted at a tertiary referral centre. Adult recipients of active transcutaneous hearing implants were invited to complete open-ended questionnaires. Responses were analysed thematically using NVivo® software until saturation was achieved.

Results: Thirty-one responses were analysed (69 percent response rate). Six themes were identified: impact of hearing loss; pre-operative experience; positive impact of the hearing implant; associated drawbacks; variation in audiology support; and limited awareness of hearing implants. Most patients reported significant improvements in hearing, confidence, and quality of life. However, experiences were influenced by prior device use, expectations, and individual circumstances. Limited clinician awareness was repeatedly identified as a barrier to timely access.

Conclusion: Active transcutaneous hearing implants provide substantial patient-reported benefit. Improving clinician awareness and managing expectations may enhance patient experience and access to care.

Special invited session: Research inclusivity and engagement – a panel discussion with members of local communities. *Moderator: Suhani Pattanshetti.*

There has been a growing conversation in recent years about how to make research more inclusive, reaching communities that have long been underrepresented and building participation that is genuine rather than tokenistic. Much of that conversation, however, still happens <u>about</u> diverse communities rather than <u>with</u> them.

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This panel brings together local residents from a range of ethnic communities to speak directly about their experiences with health research and engagement: what has earned their trust, what has pushed them away, and how they see the relationship between their communities and the institutions that study and serve them.

We will invite panel members to share their perceptions of where things stand today and what would make research and health engagement feel genuinely worth participating in.

Through moderated conversation and audience dialogue, attendees will gain a grounded, firsthand understanding of the barriers to participation and practical, community-rooted ideas for moving forward.

Diverse Dimensions of Gene Therapy in Audiology: The Human Side of the Story.
Invited speaker: Kai Uus

Gene therapy is emerging as a transformative area in hearing healthcare, with rapid progress in trials targeting genetic forms of hearing loss. However, its significance for audiology extends far beyond molecular mechanisms.

This talk explores the human, ethical and service-level dimensions of gene therapy in audiology, with a focus on equity, genomic literacy, Deaf community perspectives and clinical communication. Drawing on current literature and audiology-specific considerations, the presentation outlines the main therapeutic approaches (gene replacement, gene suppression and gene editing) before examining how candidacy is shaped by genetic mechanism, cochlear target cells, timing of intervention, reversibility and long-term uncertainty. Particular attention is given to the of inequity, whereby advanced therapies may benefit only those with timely access to genomic testing, specialist services and well-resourced health systems.

The presentation also considers the evolving role of audiologists as clinical navigators in genomic hearing care, including their responsibilities in recognising referral pathways, supporting patient understanding, communicating uncertainty and collaborating with genetics professionals. Ethical issues are foregrounded, including decision-making, irreversibility, informed consent, and the need to balance biomedical benefit with cultural perspectives on Deafness. The talk argues that successful implementation of gene therapy in audiology will depend not only on scientific progress, but also on deliberate attention to fairness, trust, communication and culturally sensitive practice. Audiologists will be central to ensuring that gene therapy is introduced in ways that are clinically responsible, ethically robust and responsive to the lived experiences of patients, families and Deaf communities.

Posters:

Individual Management Plan Outcome Score (IMP-OS): Psychometric evaluation of an adult aural rehabilitation idiographic patient-reported outcome measure for use in audiology. *Sueann Meyer, Jane Wild, Sarah. E. Hughes, Paul Sheppard, Sarah Bant*

Background/Objective: Idiographic patient-reported outcome measures (I-PROMs) have been shown to be an engaging and meaningful way of collecting therapeutic outcomes in healthcare, but no such tool currently exists in adult aural rehabilitation. This paper describes a new I-PROM, the Individual Management Plan Outcome Score (IMP-OS) that was developed in a North Wales audiology service and aims to assess its psychometric properties.

Methods: IMP-OS was compared to two existing condition-specific patient reported outcome measures (PROMs) for convergent validation, and a generic health-related quality of life PROM for divergent validation. Test–retest reliability was also assessed, and normative data were derived, leading to the creation of clinical interpretation recommendations. Convergent, divergent validation and normative data were based on sample A (59 adults) and for test–retest, sample B (15 adults).

Results: IMP-OS was significantly correlated with some condition-specific PROMs, but not with the generic PROM. It had a moderate-excellent test–retest reliability. Normative data showed that scores below 50 would suggest further clinical intervention is warranted, and should guide further therapeutic discussions with the patient.

Conclusions: IMP-OS is the first I-PROM in audiology to be psychometrically verified using international best-practice. It has been shown to reflect aspects of hearing-related outcomes that are important to patients and can be easily integrated into current clinical practice thus helping guide patient-centred care.

The Warm-Cool Relationship: A novel diagnostic index for Menieres Disease in caloric testing. *Raheel Ahmed, Debbie Cane, Garreth Prendergast, David Jay*

Introduction: Episodic vertigo is associated with two main Meniere's disease (MD) and vestibular migraine (VM) which are difficult to separate based on symptom profile alone. It may be argued that these two conditions sit on one spectrum. An atypical relationship between warm and cool responses in caloric testing has been anecdotally found to be a diagnostic marker of active MD. This may elucidate the pathophysiological mechanisms underpinning either condition, which has largely remained a mystery.

Aims: (1) How useful is the caloric test in resolving the diagnostic dilemma between MD and VM in Manchester University Hospitals? (2) How often do atypical results occur in the bithermal caloric test, and is there any correlation with active MD diagnoses?

Methods: A retrospective service evaluation was conducted of MD and VM patients who underwent bithermal caloric testing at Manchester University Hospitals Foundation Trust between January 2022 and January 2026. Patient data was extracted from local patient management systems. Canal paresis (CP), directional preponderance (DP), warm–cool relationship (WCR), and video head impulse test (vHIT)-CP dissociation were analysed statistically. A pooled ordinary least squares regression model was used to model WCR in water caloric VM ears without peripheral aural symptoms (n = 28). Receiver operating characteristic (ROC) analysis assessed the ability of WCR to distinguish active definite MD (n = 29) from the remaining VM ears (n = 54) as well as CP and DP (N = 74). vHIT-CP dissociation (N = 67), CP and DP discriminatory value were analysed separately using univariate logistic regression. DP and WCR were analysed against episode recency using a Kruskal-Wallis rank sum test and a Spearman's Rank Correlation, respectively.

Results: The WCR showed discrimination significantly better than chance between MD and VM (AUC = 0.84). A 0.523 cut-off was established with 59% sensitivity and 94% specificity. CP (AUC = 0.74) showed statistically significant discrimination ($p < 0.001$) between MD and VM, while DP (AUC = 0.66, $p = 0.474$) and vHIT-CP dissociation ($p = 0.073$) did not. DP and WCR were not a significant measure of episode recency ($p = 0.17$ and $p = 0.75$, respectively).

Conclusions: Caloric testing (CP and WCR indices) is useful in discriminating between MD and VM. Atypical findings (WCR) may be a better discriminator of active MD and VM than CP. A WCR of less than 0.523 may therefore be useful for ruling in an MD diagnosis.

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The holistic benefits of adaptive gain behavior in remote microphones. *Min Roh*

Remote microphone technology is under-utilized by people with hearing loss. Some barriers to this include the complexities of using the technology, but also from the lack of awareness and motivation of hearing care professionals to promote the use of remote microphones alongside hearing aids.

This talk will highlight the evidence to date of advanced remote microphone technology in a diverse population (CI users, HI users (both adults & pediatrics), LUHU, APD), including recent study results that go beyond speech understanding alone.

Refining and Piloting a Parent- and Teacher-Behaviour Intervention to Support Pragmatic Development in Deaf Children. *Yimeng Li, Helen Chilton, Nia Coupe, Antje Heinrich*.

Pragmatics is the social use of language. Children primarily acquire pragmatics through incidental learning, which can be enhanced by rich communicative environments and opportunities created by caregivers, including parents and teachers. Deaf and Hard of Hearing (DHH) children often experience delayed pragmatics and the following delays in social participation and lifetime achievements. While several interventions aim to support pragmatic development in DHH children either directly or via their parents, evidence- and theory-based interventions with clear mechanism-driven change and proven efficacy are yet to be developed.

The overarching aim of the PhD project is to develop such an intervention by adapting the following existing resource aimed at parents and Teachers of the Deaf (ToD) for improving the pragmatic outcomes in DHH children: Supporting the Pragmatic Skills and Social Communication Skills of Deaf Children.

This study follows the MRC framework. Step 1, evidence profile generation. All suggested communicative behaviours currently included in the resource are reviewed regarding their efficacy, theoretical mechanisms, and implementation issues in enhancing pragmatics in DHH children. Step 2, resource refinement. Focus group sessions are conducted with parents and ToDs. Their perspectives on resource acceptability and contextual barriers and facilitators to communicative behaviour enactment are then combined with the evidence profiles generated in Step 1 to inform resource refinement. Step 3, intervention package development. Remaining behaviour change support gaps are identified in the refined resource, and the intervention package is developed by retaining existing behaviour change support and addressing identified gaps. Step 4, intervention testing and refinement. Stakeholder workshops, Patient and Public Involvement and Engagement, and a pilot study are conducted to test and refine the intervention.

The result of steps 1 and 2 will be presented in the poster.

A unified view of purposeful behaviour in everyday interpersonal communication: the Purposes-Actions-Benefits-Costs (P-ABC) model. *Graham Naylor*

This presentation introduces the Purposes–Actions–Benefits–Costs (P-ABC) model of everyday communication behaviour. In this model, people continuously evaluate how well current conversational states serve personally relevant purposes, and select among afforded actions to reduce discrepancies between desired and actual states, informed by predictions of benefit and cost. The P-ABC model takes the form of a self-regulating feedback loop with four core constructs - Purpose, Action, Benefit, and Cost. It extends prior theories, mapping benefits and

costs to clearly defined domains, unifying the treatment of different types of actions and purposes, and integrating prioritisation across multiple simultaneous purposes.

Properties of the model include: cognitive, physical, and expressive forms of effort are interchangeable; retreat from one purpose may be accepted to advance another; hidden purposes drive observable behaviours, and unique mappings between Purpose, Action, Benefit, and Cost are rare, challenging simple interpretations of observed behaviour.

For research applications, the P-ABC model exposes the risk of confounds between experimenter and participant goals. It also shows that the use of hearing devices results in altered affordances. For intervention development, the model suggests counselling approaches that re-prioritise purposes. Overall, the P-ABC model offers a novel, purpose-centric lens through which to understand hearing-related behaviour, that embraces complexity, broadens the concept of 'effort' in hearing sciences, and inspires new approaches for research and intervention.

Patient-Reported Fears of Anaesthesia, Surgical Complications and Device Failure at Cochlear Implant Surgical Listing: A Prospective Study of 400 Adults. *Emma Stapleton*

Introduction: Cochlear implantation is a safe and effective intervention for adults with severe-to-profound hearing loss, yet remains substantially underutilised among eligible candidates, with only 5–10% of eligible adults receiving a cochlear implant in the UK. While barriers to cochlear implant uptake have been widely discussed at a sociodemographic level, less is known about patients' own fears and preconceptions, and how these may influence engagement with the cochlear implant pathway. This study explored patient fears at the point of cochlear implant surgical listing.

Methods: Consecutive adults attending a cochlear implant surgical listing appointment between January 2019 and June 2025 were asked whether there was anything they were particularly afraid of or worried about regarding cochlear implant surgery. All patients had completed audiological assessment, rehabilitation and multidisciplinary team review and had been approved for cochlear implantation. Responses were recorded prospectively and analysed thematically using NVivo software.

Results: Five principal themes emerged. Patients expressed concern that the cochlear implant would not work or would fail to deliver the hearing outcomes they hoped for. Some described fears relating to surgical complications, including facial nerve injury and loss of residual hearing. Concerns regarding general anaesthesia were frequently expressed, including fear of losing control, being put to sleep and postoperative recovery. Some patients perceived cochlear implantation as a lengthy or complex procedure requiring prolonged hospitalisation. In contrast, a proportion of patients reported no specific fears or worries regarding cochlear implantation.

Conclusions: Patient fears remain evident at the point of cochlear implant surgical listing despite comprehensive prior assessment, information sessions, rehabilitation and multidisciplinary review. The persistence of concerns at this late stage of the patient journey raises important questions regarding the influence of similar fears earlier in the pathway. Addressing patient concerns through accurate education, counselling and discussion of contemporary cochlear implant practice, including day-case surgery, short operative times and the option of implantation under local anaesthesia, may help reduce perceived barriers and improve access to cochlear implantation among eligible adults.

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Lost in Translation: Understanding of jargon used in clinic-patient correspondence. *Helen Whiston, Amber Roughley, Gemma Perfect, Jenny Chan, Mark Sladen, Lucinda Pennington, Gabrielle Saunders*

Objective: To establish the level of patient understanding of medical jargon used in letters sent to patients from Audiology departments after an audiology assessment appointment.

Design: Participants were asked to define commonly used audiology jargon terms via an online survey platform. Definitions were scored as having demonstrated either full, partial or no understanding by the research team. The jargon terms were extracted from letters sent from UK National Health Service (NHS) audiology clinics following hearing assessment appointments.

Study sample: 175 participants over the age of 50 (mean age 70).

Results: Researchers identified 31 jargon phrases in the NHS letters. Definitions given by the participants generally demonstrated poor understanding, with frequent incorrect definitions given for certain phrases. There were very few phrases for which the majority of participants demonstrated full understanding.

Conclusion: Patient understanding of jargon in NHS audiology department letters is poor, and therefore the use of these phrases should be avoided, or their meaning clearly explained within the letter.

Assessing the different types of listening difficulty in noise in adults with normal or near-normal hearing. Jenny Chan, Gabrielle H. Saunders. Michael Stone, Harvey Dillon.

Background. The aim of this study is to investigate the presence and some of the possible causes of self-perceived listening difficulty in noise in adults with normal or near-normal hearing thresholds.

Methods. A comprehensive test battery was given to two groups comprising a total of 118 individuals with normal, or near-normal air-conduction hearing thresholds. They are (1) 42 people who self-declare listening difficulty in noise; and (2) 76 people who do not declare such difficulties. Their low-level auditory functioning was assessed using a range of listening tasks designed to tap into different auditory abilities, including non-speech based tests of auditory processing, and the Language Independent Speech In Noise and Reverberation test (LiSN-R), which measured phoneme identification in noise, ability to use spatial cues to segregate target sounds, and the impact of reverberation on speech sound identification. High-level cognitive and language abilities were assessed using a short-term and working auditory memory test (DigiSpan, forwards and backwards) and an auditory closure test (AudiCloze). Sentence understanding in noise was assessed using the Test of Listening Difficulties - Universal (ToLD-U). Finally, self-perceived listening ability was assessed using the subjective counterpart of ToLD-U (ToLD-US) in which people estimate the proportion they understand at different signal-to-noise ratios; and questionnaires, including the Image-Based Questionnaire for Hearing (IBQ-H), the Revised Hearing Handicap Inventory (RHHI) and a sub-set of the Speech, Spatial and Hearing Qualities Questionnaire (SSQ).

Results and conclusion. Self-declared difficulties hearing in noise were consistent with the various questionnaire scores. However, a range of factors are likely to lead to self-perceived listening difficulties. Some are significant across the group, and some may affect only a small subset of individuals, so are not significant at the group level.

Two non-invasive tests for stria vascularis defects. *Karen P Steel, Neil J Ingham, Clarisse H Panganiban, Carolyn M McClaskey, Christopher J Plack*.

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Age-related hearing loss involves three main sites-of-lesion in the cochlea, based on temporal bone analysis: sensory hair cells; their connecting synapses and neurons; and the stria vascularis (Schuknecht & Gacek 1993). The stria vascularis maintains the high potassium level and high resting potential (endocochlear potential) in endolymph in the cochlea which is essential for normal hair cell function. If strial function is compromised in a person, attempts to treat hair cell or neural deficits by gene therapy or drugs are unlikely to be successful, but treatments aimed at restoring strial function may work. We cannot measure strial function directly in humans as we can in animals. Therefore a non-invasive diagnostic tool is needed to distinguish strial dysfunction from other primary sites-of-lesion.

We have used a set of mouse mutants with well-characterised progressive hearing loss due to primary defects at these different sites-of-lesion to explore potential non-invasive tests to distinguish reduced strial function from other cochlear pathologies. As expected, a combination of DPOAE and ABR recordings could be used to distinguish primary hair cell dysfunction (raised thresholds for both measures) from primary synaptic or inner hair cell defects (raised thresholds for ABRs but normal DPOAEs).

We have discovered two tests that can distinguish primary strial dysfunction from primary hair cell or neural defects using a standard ABR electrode array. The first is based on measurement of Inter-Trial Coherence (ITC) of single-trial ABR recordings. This test compares the response from each individual stimulus delivered and determines the coherence between trials of the uniformity of the response phase. In mice with reduced endocochlear potential, the responses have a high level of inter-trial coherence (also known as phase locking value, PLV) relative to response amplitude, suggesting that hair cells retain normal temporal processing despite a reduced driving force across transduction channels and reduced amplitude of response. Mice with primary hair cell or neural deficits showed reduced ITC. The second test is based on measurement of Amplitude Modulation Following Responses (AMFRs) in auditory brainstem activity. These were evoked by carrier tones presented at 80dB SPL and sinusoidally amplitude-modulated at rates from 100-1750Hz. We calculated AMFR magnitude and synchrony coefficient as a function of modulation frequency. AMFR amplitude vs modulation frequency transfer functions were multi-peaked in normal hearing mice, having peaks close to modulation rates of 300Hz, 600Hz and 1000Hz. Mouse mutants with primary hair cell or neural deficits showed reductions in AMFR amplitude and synchrony at these three modulation rates. However, mice with primary stria vascularis dysfunction showed normal AMFRs at the highest modulation rates, although AMFR was reduced around 300Hz and 600Hz.

The ITC test was developed in humans before adapting for mouse testing, so it is eminently suitable to use alongside AMFR in a diagnostic test battery to distinguish the site-of-lesion in the clinic. This would help to stratify clinical trials of treatments to maximise the chances of detecting an effect, to inform treatment selection for individuals when these treatments are available, and to guide further development of personalised hearing aids.

Let's see what this one does: A qualitative framework for understanding hearing-aid gain self-adjustment. *Janin Benecke, William M Whitmer*

Studies employing and evaluating hearing-aid self-adjustments frequently label the resulting settings as "preferences" without questioning that label. There is a lack of inquiries into the rationale behind participants' choices or their approach to self-adjustment. We here employed a thinking-aloud protocol concurrent with individuals' self-adjustments to capture qualitative perspectives on these processes. Thirty-six adult hearing-aid users were asked to report everything that goes through their minds while adjusting to their preference three stimuli (music, speech or speech in noise) using three control interfaces (1 slider jointly controlling bass/treble, 2 sliders separately controlling bass and treble or 3 sliders controlling bass, mid

and treble). The audio and video of each trial were transcribed, annotated and then analysed using inductive content coding and thematic analysis. Participants' approach and navigation of the self-adjustment process was best defined as a continuum between exploratory and anticipatory strategies. The exploratory type initially assesses control functions, then selects the optimal setting from available options, and evaluates sound changes affectively in isolation or comparatively against prior settings. The anticipatory type begins by evaluating the sound, identifying issues, adjusting settings guided by past experiences, and evaluating adjustments against the identified issues. Some participants demonstrated both types of behaviour within the same adjustment. Additionally, the descriptors elicited during adjustments generally showed good agreement with previous expert-based data. The resulting qualitative framework of self-adjustment helps explain the rationales for decisions hearing-aid users make during the personalisation process and with further refinement, this framework could be incorporated into future hearing-aid assistance features.

Primary care for tinnitus and hyperacusis: a service evaluation of general practice in the United Kingdom. *Nic Wray, Derek Hoare, Magdalena Sereda, Kathryn Fackrell.*

Aims. It is estimated that over 1 million tinnitus consultations occur annually in UK primary care, yet previous surveys demonstrate variability in assessment and management. Hyperacusis remains less well described in this setting. This study aims to update the 2011 UK data on GP practice in tinnitus care and, for the first time, evaluate assessment and management of hyperacusis in primary care.

Method. An online and paper survey with 17 questions (open and closed options) was sent to 3200 named GPs within practices across the four nations. Respondents were required to answer questions on assessment, management, referral and guideline use for tinnitus and hyperacusis. To date, 139 GPs have responded. Recruitment is ongoing.

Results. Preliminary analysis indicates variation in tinnitus and hyperacusis practice by GPs. Of the 139 respondents, 9% reported a special interest in ENT compared to 18% reported in 2011. Over 90% respondents reported seeing at least one adult with tinnitus every month whilst 39% reported seeing one presenting with hyperacusis every month.

During tinnitus consultations, over 85% screened for tinnitus red flags (laterality and pulsatility) and 99% asked about hearing loss. Fewer questions were asked during hyperacusis consultations, with 6% of respondents asking no hyperacusis-specific questions. Otoscopy was performed more often than other tests with both tinnitus (96%) and hyperacusis (86%) patients. Tinnitus referrals were discussed by 95% of GPs, with the most common destinations being ENT (91%), audiology (63%) and psychology (25%), although numbers of cases referred varied. Hyperacusis referrals were discussed by 81% of GPs, but fewer GPs made referrals, with ENT (69%), audiology (53%) and psychology (19%) being the most frequently utilised.

Although 76% of respondents reported self-management options were available, few routinely discussed them with patients. Signposting to online resources (55%) and relaxation therapies (54%) were the most reported approaches. Only 3% of GPs discussed hyperacusis self-management, with 19% unaware of any available options.

Use of NICE guidance was reported by 52% for tinnitus and 32% for hyperacusis, despite no hyperacusis guidance existing, and 30% of respondents did agree that primary care services provide satisfactory advice and care for tinnitus compared with 18% for hyperacusis. Respondents did report that tinnitus (43%) and hyperacusis (28%) impacted their practice sufficiently to warrant additional training or resources.

Discussion. Our preliminary analysis suggests potential inequity in UK primary care management of tinnitus and hyperacusis, particularly regarding hyperacusis advice and referral. The results suggest a decline in the proportion of GPs with an ENT interest over the last 15 years and an increase in need for additional training or resources for tinnitus and hyperacusis.

The reasons behind these changes remain unclear but may reflect reduced specialist expertise, greater awareness of tinnitus and hyperacusis, changes in service provision, limited treatment options or a combination of factors. Further work is needed to explore this in more detail. However, clearer national and local guidance, improved referral pathways, and proportionate educational support may help strengthen confidence and consistency of care.

From classification to function: rethinking support for children with mild-to-moderate bilateral and unilateral hearing loss in educational settings. *Lynne Blair, John Lim, Hannah Leigh, Maya Roberts, Hannah Stewart*.

Children with mild-to-moderate bilateral or unilateral hearing loss frequently experience reduced access to assistive technologies and specialist support within mainstream education. Research evidence shows that these types of hearing loss can negatively affect speech perception in noise, language development, and academic outcomes. Despite this, awareness of the functional implications of mild-to-moderate and unilateral hearing loss remains limited, particularly in noisy listening conditions where listening fatigue and cognitive load are increased.

This research focuses on educational settings, which are rich with information but are typically acoustically challenging and socially dynamic, including group work, informal interactions, and extracurricular activities. A mismatch is identified between clinical classification and functional need, with current models of support failing to adequately reflect the everyday listening needs of this population in educational settings.

This work follows a participatory research approach, with ongoing stakeholder engagement informing study design, interpretation, and output development. Data collection includes semi-structured interviews with key stakeholders across audiology, education, and family contexts, and is supplemented by secondary analysis of existing workshop datasets involving deaf children. Thematic analysis is organised through the intersecting lenses of education and technology, capturing shared and divergent stakeholder perspectives. Within this framework, multiple themes emerge, spanning educator awareness, background noise, classroom acoustics, challenges with assistive technology, and access beyond the classroom.

These themes highlight several key issues that shape everyday listening experiences in educational contexts. Firstly, classroom listening environments remain suboptimal, with high levels of background noise and acoustically challenging conditions limiting access to spoken information and increasing listening effort. Secondly, while assistive technologies are available in some cases, their effectiveness is constrained by inconsistent use, limited application beyond the classroom, variability in inclusive practices, and insufficient training among educators. Thirdly, responsibility for managing communication access is often placed on the child or young person, including monitoring device use and troubleshooting technical issues. This reflects a broader tension between institutional authority (e.g. audiology and educational guidelines) and the lived experience of deaf children and young people, including the need to balance the development of individual responsibility and agency with the provision of appropriate specialist support, particularly for younger children and those with additional needs.

This work highlights a critical ‘grey area’ that sits between audiology and educational provision, where audiological classification does not align with functional need in real-world listening contexts. This reframes mild-to-moderate and unilateral hearing loss as a complex and context-dependent accessibility issue, rather than a static clinical category. Technology alone is insufficient to address this mismatch. Effective support requires increased awareness, targeted training, environmental adaptations, and ongoing multidisciplinary input.

To support this, findings were translated into public-facing visual outputs, including narrative journey maps, edge-case scenarios, and a ‘myth vs reality’ framework. These materials provide a practical resource to support more informed decision-making, highlight mismatches between professional practice and lived experience, and promote inclusive, context-sensitive approaches across clinical, educational, and family settings.

Dissociating Cochlear Tuning and Synaptic Loss in Speech-In-Noise Recognition Using a Cochleagram-Based Computational Framework. *Pedro Andres Alba Diaz, Srikanta Mishra*

Normal-hearing listeners rely on precise cochlear tuning and intact auditory-nerve synapses to perceive speech, particularly in adverse listening conditions. However, the relative contributions of frequency selectivity and neural fidelity to speech recognition remain poorly understood, in part because these factors cannot be independently manipulated in human experiments. This distinction is critical, as deficits in cochlear tuning can mimic perceptual consequences often attributed to cochlear synaptopathy, yet are rarely accounted for in its interpretation. We applied a computational framework to dissociate the effects of cochlear tuning and synaptic integrity on speech recognition using a cochleagram-based automatic speech recognition framework.

Speech from the VCTK corpus (48 kHz) was transformed into gammatone cochleagrams using 128 filters spaced on the equivalent rectangular bandwidth scale from 20 Hz to 20 kHz. Two forms of peripheral degradation were simulated: (1) reduced frequency selectivity, representing outer hair cell dysfunction, was modeled by broadening filter bandwidths (×1.0, ×1.5, ×2.0), and (2) synaptic degradation was simulated by attenuating a fixed proportion of frequency channels (0% healthy; 50% moderate; 75% severe), with consistent channel selection within each recording. These manipulations were combined in a 3×3 factorial design and evaluated in quiet and at 0, −6, and −9 dB signal-to-noise ratios using speech-shaped noise, yielding 36 conditions per recording.

Cochleagrams were decoded using a convolutional neural network (CNN) coupled with a bidirectional long short-term memory (BiLSTM) phoneme recognizer. The model was trained on undegraded cochleagrams across all noise levels and tested on degraded conditions, simulating a sudden peripheral deficit without central adaptation. Performance was quantified using phoneme recognition accuracy, recognition thresholds, and error patterns for consonants and vowels.

Both degradations are expected to impair recognition, particularly at low signal-to-noise ratios. However, we predict distinct signatures: broadened tuning should mainly increase vowel errors by degrading formant resolution, whereas synaptic degradation should primarily affect consonant recognition by degrading temporal-envelope encoding. Importantly, this framework enables direct comparison of cochlear and synaptic deficits under controlled conditions and provides a mechanistic test of whether perceptual deficits commonly attributed to synaptopathy can instead arise from impaired cochlear tuning. Detailed results will be presented and discussed in the context of speech-in-noise recognition in individuals with normal audiograms. Study findings will help establish whether hair-cell–mediated deficits must

be ruled out before attributing speech-in-noise difficulties to synaptopathy, with implications for interpreting subclinical hearing loss and guiding diagnostic approaches.

Behaviours That Facilitate Children's Listening During Dyadic Group-Work in a Noisy Classroom. *Megan Griffiths, Tom Beesley, Hannah Stewart*

Listening to speech is an essential ability for learning in classrooms. Speech itself can be changed at its source by voice characteristics like pitch and accent, during transmission by things such as reverberation, and finally by individual characteristics of the receiver (Mealings et al., 2023). But, for the receiver to understand the speech, it must first be heard and then listened to. Due to this, deafness and listening difficulties (LiD) can be extremely impactful on children's educational outcomes. For example, in 2025, only 42% of deaf children obtained a 'good level of development', compared to 68% of all children (Key Stage 4 Performance, 2026). Further, around 5% of children are referred to clinics for LiD despite having normal hearing (Hind et al., 2011). This highlights the importance of accounting for not just hearing ability, but also everyday listening ability.

The present study aims to discover what specific strategies hearing children aged 10-11 use to listen in noisy classroom-like environments. This study takes a naturalistic approach by physically simulating a classroom environment but retaining some lab-based elements, such as task structure. Inspired by Hadley et al. (2019)'s study with adult dyads, we use motion capture and eye-tracking with conversational prompts. We also included a communication task using the DiapixUK picture pairs, designed to elicit spontaneous speech and examine interactions between dyads (Baker & Hazan, 2011). These tasks were chosen to mimic classroom-like task demands and distractors as children engage in different kinds of learning, from paper based to peer work. We anticipate that this requires them to adapt their listening strategies. Further, the classroom environment changes throughout the day so each task is completed in three noise conditions: quiet-work (44 dB SPL), group-work (72 dB SPL), steady-state noise (66 dB SPL). We are also gathering subjective measures to supplement the behavioural data. Specifically, the Children's Communication Checklist 2 to measure language and pragmatic communication ability, and the NASA-chTLX to measure the child's perception of task effort (Bishop & McDonald, 2009; Hart & Staveland, 1988; Laurie-Rose et al., 2017).

We hypothesise that, like adults, participants will increase their looks towards their partner's mouth and lean in more in louder noise. We also hypothesise that the paper based DiapixUK will limit participant's use of optimal listening strategies, as seen through decreased mouth gazes and leaning in than in conversation conditions. By comparing behaviours elicited in 'quiet' versus noise in this classroom-like environment, we aim to identify the strategies children use to improve hearing and listening to create a baseline. We hope this can be used to see which measures are most appropriate for future work with other populations, such as children with deafness or LiD. We aim to present full sample (n = 34, 17 dyads).

Brain Stimulation for Hearing Aid Efficacy in Age-Related Hearing Loss. *Jessica Pepper, Jason D. Warren, Christopher J. Plack, Kate Slade, Helen E. Nuttall*

By the age of 70, nearly 80% of people experience some degree of hearing loss. Reduced auditory signal can lead to atrophy of auditory brain regions. Whilst hearing aids may offset such neuroplastic changes, adjusting to hearing aids can be time-consuming. The neural and behavioural benefits of hearing aids may be realised more quickly by using facilitatory Transcranial Magnetic Stimulation (TMS) to support hearing aid adaption. This study investigated whether increasing the neuroplastic potential of the brain with TMS can accelerate the benefits of hearing aids for older adults with age-related hearing loss.

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Preliminary data (N=14) are reported from participants aged 60-85 who received hearing aids in the last 3 months (target sample N=92). Participants were divided into active and sham TMS groups for a 5-day TMS intervention. Neural responses to sound (event-related potential: N100), audiological performance (QuickSIN) and cognitive function (memory, executive function, processing speed) were compared before (Timepoint 1) and after (Timepoint 2) the TMS intervention. Participants will also be measured 6 months later.

Data indicate that mean N100 amplitudes decrease from Timepoint 1 to Timepoint 2 in the active TMS group: -2.58 (SD=2.54) to -2.25 (SD=2.16), yet increase in the sham TMS group: -2.18 (SD=1.96) to -2.63 (SD=1.85). Mean QuickSIN scores were 2.74 (SD=1.66) and 2.74 (SD=1.82) at Timepoints 1 and 2 in the active group, compared with 3.40 (SD=2.66) and 3.17 (SD=2.13) in the sham group. Differences in N100 and QuickSIN are non-significant. A mixed ANOVA revealed a significant main effect of timepoint on cognition ($F(1,12)=19.82$, $p<.001$); across groups, cognitive performance was better at Timepoint 2 (M=113.79, SD=9.66) than Timepoint 1 (M=102.93, SD=13.11).

Current preliminary results indicate that cognitive scores may improve with hearing aid adaption. Data collection is ongoing, and we will observe how TMS benefits neural and behavioural responses to speech, accounting for individual hearing acuity and cognitive reserve as baseline. We will also discuss how individualised neuromodulation in age-related hearing loss could be used to support hearing care.

What influences conversation behaviour? A concept mapping study of naïve participants' views. *Lucy Robertson, Alistair Beith, Graham Naylor.*

The ways in which people behave in conversations differ considerably from one conversation to another, as people adapt to the contextual affordances and demands of the conversation. This diversity represents a major challenge for hearing researchers striving to identify salient characteristics of conversation behaviour in relation to hearing difficulty, since any experimental approach can only sample a very limited subset of possible ‘influencer’ factors.

It is recognised that factors unrelated to sound or hearing as such exert substantial influence on behaviours such as backchanneling, dominance of talk-time, and requests for repetition or clarification. Some influencing factors (e.g. interlocutor familiarity) are relatively easily controlled or measured. Others may remain undiscovered, and/or be difficult to control or manipulate in an experimental approach. This means that direct observation of their effects on behaviour, and of the relative strengths of their influence, is impractical.

One way forward is to take a metacognitive approach, allowing people themselves to generate a diverse list of influencing factors and to reflect on the level of influence those factors have on behaviour. This also addresses the risk that we as hearing scientists may have a biased and blinkered view of what actually influences behaviour, both in terms of distinguishing between factors, and of assessing their relative importance.

We addressed the above goal using Group Concept Mapping methodology, executed online. 40 to 55 participants (dependent on study stage), of whom 31% to 50% had hearing loss, carried out the following (individually):

1. Listed things that could influence their behaviour in conversations.
2. The resulting 412 items were condensed to 91 by the authors.
3. Placed the 91 items into groups according to individually meaningful distinctions.
4. Rated the 91 items for their degree of influence on the participant’s behaviour.

Clustering of the output from stage 2 provided nine clusters, whose contents were scrutinised to motivate provisional labels. Means of each cluster were calculated for both people with

hearing loss (PHL) and people with normal hearing (PNH). The nine clusters were: Framing of the conversational event (PHL M = 3.71; PNH M = 3.77), My motivation to participate (PHL M = 3.44; PNH M = 3.72), Interpersonal familiarity (PHL M = 3.27; PNH M = 3.69), Social identities and power dynamics (PHL M = 3.00; PNH M = 3.38), Characteristics and behaviour of others (PHL M = 3.23; PNH M = 3.41), Behavioural determinants of access to signal (PHL M = 3.44; PNH M = 3.03), My disposition (PHL M = 3.41; PNH M = 3.96), Environmental determinants of access to signal (PHL M = 3.67; PNH M = 2.95), Disruption of conversational norms (PHL M = 3.56; PNH M = 3.56).

This poster will present the derivation and detail of these results, and their implications for hearing research relating to conversation.

Individualised rhythmic transcranial magnetic stimulation differentially modulates alpha oscillators in older and younger adults during listening. *Kate Slade, Jessica Pepper, Elise Oosterhuis, Björn Herrmann, Ingrid Johnsrude, Helen Nuttall*.

Age-related changes in hearing and cognition affect how the brain adapts to perceptual challenge. Alpha-band oscillatory activity may be functionally important for adaptive listening. Specifically, alpha activity is theorised to support attention to target speech and inhibition of irrelevant sensory information during complex listening situations. Crucially, alpha oscillations are individualised and vary in peak frequency, magnitude, and dominant neural generators across populations and contexts. However, it remains unknown whether these oscillations can be causally and selectively modulated to support individualised listening across the diverse ageing population. Transcranial magnetic stimulation offers a promising technique through which neural oscillations can be modulated on an individual level, by delivering stimulation at a participant's individualised alpha peak frequency.

In this study, we combined individualised alpha-frequency transcranial magnetic stimulation (alpha-TMS) with electrophysiological and behavioural measures to test state-dependent modulation of auditory and parietal alpha oscillators during listening. Younger (N = 32, Mean Age = 20.8, SD = 2.59) and older adults (N = 32, Mean Age = 68.4, SD = 5.01) completed an irrelevant speech paradigm, in which they were required to attend to, and later recall, a series of spoken digits. Prior to recalling those digits, participants heard irrelevant speech, which they were required to ignore. During the task, participants received alpha-TMS stimulation to the auditory cortex, parietal cortex, and a control location (vertex), to determine whether individualised alpha-TMS modulates task-relevant alpha activity during listening. By harnessing individual neural oscillatory patterns, it may be possible to account for variability in listening and deliver individualised stimulation for improved listening outcomes.

Data show that individualised alpha-TMS preferentially modulates alpha oscillations in auditory cortex in older, but not younger, listeners. In contrast, TMS driven alpha modulation in parietal cortex is associated with listening performance differentially across age-groups and relates to hearing sensitivity in older listeners. These findings suggest that there are age-related differences in engagement of alpha oscillators during listening and indicate that efficacy of modulation may be driven by individual differences in hearing sensitivity.

This study provides the first evidence for individualised, state-dependent modulation of auditory alpha oscillations during listening using TMS. Further, the results show age- and sensory-related differences, indicating that diversity associated with ageing and hearing plays an important role in the modulation of neural rhythms for perception. This research could have relevant therapeutic implications, particularly with regards to future individualised neurophysiological approaches to supporting speech perception, particularly in ageing populations.

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Family-Centred Early Innovation Principles in Action (case studies from India) Deaf Child Worldwide. *Shampa Nath*

Through over a decade of work in Karnataka, India, Deaf Child Worldwide identified major gaps in early identification and intervention for deafness. This included low deaf awareness among parents and frontline health workers, limited early screening, stigma, and inadequate follow-up services. Early intervention was largely viewed through a medical lens, with insufficient attention to family and societal factors.

In 2023, Deaf Child Worldwide partnered with local NGO Prarambha to pilot a Family-Centred Early Intervention model in the Koppal and Raichur districts, categorised by the national government as some of the most deprived areas in India. This pilot integrates medical and social approaches, strengthening collaboration between communities and hospital referral systems.

The EMOTION Framework: embedding routine feedback in paediatric audiology. *Emma Papakyriakou, Anushri Patel, Sian Lickess, Angela Deckett, Alison Worsley.*

Background: The Kingdon Review (2025) emphasised the importance of listening to families and involving them in shaping children's hearing services. Routine feedback helps services understand what matters most to deaf children and their families, what is working well and where improvements can be made. We supported three distinct areas of work focused on families lived experiences of children's hearing services across England, Northern Ireland and Wales. In England, we explored families' experiences of the NHS 'review and recall' process, introduced to address quality assurance concerns where families are asked to return with their child for repeat audiology testing. In Northern Ireland, we explored families' experiences of children's hearing services to identify strengths and priorities for improvement. In Wales, we worked closely with Newborn Hearing Screening Wales to understand parents' perspectives on a proposed change to newborn hearing screening policy.

This work aimed to generate insights, identify cross-cutting themes, and create guidance to support children's hearing services in seeking meaningful feedback from families, deaf children and young people.

Methods: Parents of deaf children with different types and levels of hearing loss were invited to share their experiences of children's hearing services through surveys and online interviews and focus groups. Recruitment approaches varied by project and context, including social media outreach and invitation letters distributed via NHS Trusts. All participants provided written informed consent, and sessions were audio recorded and transcribed. Qualitative data were analysed using reflexive thematic analysis (Braun and Clarke, 2016), with analysis undertaken iteratively and reflexively by the research team. The team met to generate cross-cutting themes spanning the different national contexts and develop the guidance.

Results: Families described the identification of their child's hearing loss as an emotional and vulnerable experience, where uncertainty and lack of clear steps highlighted the importance of clear and compassionate communication. These insights led to the co-production of the EMOTION framework with parents to set out core principles for routine feedback to ensure services are shaped by lived experiences and better meet families' needs.

Conclusion: The EMOTION framework aims to support paediatric audiology services to meaningfully involve families and young people in shaping their services to understand what matters to them and what changes might be needed.

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Reconstructing mispronounced and nonsense nouns in continuous speech.
Katharina Kaduk, Rebecca Holt, Dr Lynne Blair, Liam Howard, Hannah J. Stewart

Everyday communication is rarely delivered in isolated sentences and to communicate effectively listeners need to keep track of continuous speech. Speech can be ambiguous due to masking or the listener's hearing and/or listening ability. However, children's listening ability is usually assessed using sentence-repetition tasks primarily measuring speech intelligibility rather than their ability to detect and repair ambiguous words. Previous behavioural work (e.g. Roebuck and Barry, 2018) has shown that hearing children with listening difficulties are less able to detect mispronunciations and nonsense words during story listening and may struggle to sustain attention over time. However, behavioural measures alone cannot identify the precise moment at which children process unexpected or ambiguous words within continuous speech.

This study evaluates the feasibility of a naturalistic ERP paradigm for measuring children's real-time processing of altered speech during continuous listening. This paradigm was designed with clinical populations in mind (e.g., children with mild-to-moderate hearing loss).

Event-Related Potentials (ERPs), particularly the N400 component, provide a sensitive measure of real-time semantic processing with excellent temporal resolution. The N400 is reliably modulated by word expectancy and contextual predictability (Levari &

Snedeker, 2024; Yacovone et al., 2025) making it well suited for examining how children process ambiguous speech in a naturalistic context. The present study aimed to design and evaluate an ERP story-listening paradigm to assess when primary school aged children can detect ambiguous words (mispronunciations and nonsense words).

Here we present our results so far (target n = 34) from hearing, neurotypical, monolingual English-speaking children aged 6-11 years. The children listened to a short naturalistic story adapted from the Enid Blyton Nature Stories collection while recording EEG. Throughout the ~10-minute story, target nouns were manually time-locked for ERP analysis. One-third of the nouns in the stories remained unaltered, one-third were replaced with phonologically legal mispronunciations, and the remaining third was replaced with nonsense words. All mispronounced nouns' initial consonants (e.g., 'bag') were replaced by either place of articulation ('dag') or voicing ('pag'). The nonsense words were selected from the Test of Word Reading Efficiency (TOWRE/TOWRE-2). In addition, we have used GPT2's LLM to estimate the predictability of the next words in context.

Prior to the story listening task, children were prompted that they will answer a few comprehension questions about the story afterwards. To assess children's sustain attention, children also completed the paediatric NASA Task-Load Index. Additional individual-difference measures included vocabulary, working memory, processing speed, inhibitory control, hearing thresholds, extended high-frequency, listening difficulties (ECLiPS), and behavioural word-detection.

We predict that the N400 amplitude and latency will be modulated by word type (correct, mispronounced, and nonsense words). Exploratory analyses will examine whether responses differ between the first and second half of the story to assess how listening changes over time. We will also investigate the influence of individual differences and word predictability (LLM) on N400 amplitude and latency."

Remembering the introduction of universal newborn hearing screening in England: 20 years on. *Bridget Gourlay, Ian Noonan***.**

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20 years after the rollout of universal newborn hearing screening in the UK, the National Deaf Children's Society has spoken with some of the key people who were involved in shaping the introduction and delivery of the programme. In 2026 it will publish a report which brings together, for the first time, their reflections on how the programme was introduced in England, what made it work and its transformational impact. The National Deaf Children's Society's international programme, Deaf Child Worldwide, has a strategic focus of working with low- and middle-income countries that are early in their journey with universal newborn hearing screening. It is using the findings from this report in its work.

Improving hearing assessment access for children and young adults with complex needs: A third sector perspective. *Kate Ellor, Laura Strachan, Katherine Graham*.

Background: Children and young adults with complex communication needs may experience barriers to conventional audiological assessment. The community audiology programme at Seashell directly supports the current need for audiology assessment provision for children and young adults with complex needs. By offering free audiology assessments (via a bursary) in an adapted environment delivered by specialist audiologists, we are able to ensure families get the support they need quickly, unlocking the support, pathways and guidance they so desperately need.

This project has been made possible due to the facilities on site at Seashell. In 2023, we opened our Moulding Foundation Building. A world-class specialist education facility for children with the most complex needs in the country, the school includes a state-of-the-art Audiological Assessment Suite. The only one of its kind in the UK, the suite uses specially adapted Visual Reinforcement Audiometry (VRA) equipment.

Aim: To evaluate the effectiveness of adapted assessment approaches within a specialist education and care setting delivered through the community audiology programme bursary scheme.

Methods: Retrospective review of 15 children/young adults referred to the Seashell specialist audiology service. Outcome measures included successful completion of assessment and identification of hearing needs.

Results: Hearing assessments were successfully completed in most cases. Adapted visual supports and flexible appointment structures were associated with increased assessment completion.

Conclusions: Reasonable adjustments and person-centred approaches can improve access to audiology services for individuals with complex needs and should be considered within all settings. There is also the additional need highlighted for centres of excellence with specialist trained staff and adapted resources.

Hearing aid sound design as a key consideration in personalized fitting. *Laura Winther Balling, Gitte Engelund, Dina Lelic, Frédéric Marmel*.

At its most basic, personalization in hearing aid fitting is about matching the gain in the hearing aids to the audiometric thresholds of the hearing aid wearer. This may be supplemented with fine-tuning of gain and hearing aid settings that reflect the wearer’s a priori stated listening needs or the feedback they provide after wearing the hearing aids in real life. Beyond the fitting itself, counselling is of course also an inherently personal interaction.

An aspect which is often overlooked in this context is the sound design of the hearing aids. Hearing aid sound design is important because, although most modern hearing aids meet the

basic needs of good audibility and intelligibility, their sound designs differ in many ways that may impact the listener experience. The differences include signal processing choices like filter banks, compression schemes, and noise management, as well as fitting rationales and other settings in fitting software and consumer apps. Gaining insight into listener preferences with respect to sound design is therefore highly relevant.

The first step in understanding the impact of sound design on listener experience is establishing whether listeners have preferences in the first place. We will present evidence from multiple studies using different methods that shows that approximately 40% of listeners have a strong or moderate preference when choosing between two fundamentally different sound designs.

Having established that listeners do form preferences with respect to sound design, the second step is to understand what drives these preferences. No clear patterns of hearing loss, demographic, or auditory lifestyle emerged in our analyses, but qualitative data indicate that listeners with different preferences emphasize different aspects of their sound experience. We will outline how these listener preferences relate to key aspects of different sound designs.

The third and final step is to investigate the impact of incorporating sound preference in clinical practice. We will present findings from ongoing clinical studies that investigate how exploring and identifying clients' sound preferences can be used to actively engage them in their hearing journey. Outcomes will be shared for both hearing aid wearers and hearing care professionals, alongside a discussion highlighting the importance of sound design as a key aspect of person-centred care in a diverse world.

Naturalistic Auditory Research with Flying Frogs: Design and Validation of a Synchronisation System for Different Sensors Across Time in a Naturalistic Classroom. *Brandon O'Hanlon, Liam Howard, Barrie Usherwood, Carly Anderson, Steph Ainsworth, Hannah J Stewart*

Paediatric auditory research can take place in real-world environments as classrooms (offering high ecological validity), or in lab-based environments (offering high precision). We have created a naturalistic classroom laboratory following the L3 Framework (Mealings, et al., 2023), providing a hybrid between ecological validity and precision for evaluating listening in dyadic (two-person) and tetradic (four-person) setups. However, it is difficult to use complex equipment in naturalistic spaces, such as neuroimaging and body motion-tracking, as it requires wireless synchronisation across different sensors. We have designed a synchronisation system that allows for simultaneous wireless eye- and motion-tracking, audio recording, and fNIRS hyperscanning between multiple participants, all without compromise to the naturalistic setting of our classroom.

To validate the accuracy and versatility of this synchronisation system using the above sensors simultaneously, we have conducted a methodological proof. Here, we use a 'finger'-tapping task with both a single and a tetrad participant setup in our classroom. Participants were asked to follow a visual digital metronome using sets of different coloured drums. There were three distinct playing conditions: 'Musical score' where participants played one drum; 'Four corners' where participants played multiple drums in an order dictated by visual cues; and 'Twister' where participants played multiple drums in an order dictated by auditory cues. In the tetrad setup, some participants were given a different metronome to follow at set intervals, providing motor-relevant hyperscanning measures for when participants were in-sync versus out-of-sync.

All data from each sensor was interpreted in relation to the timings of each participant's 'finger'-tapping on the correct drum. Here, we discuss this validation of our synchronisation

system and of our naturalistic classroom design, and its implication for future naturalistic research using a diverse array of sensors.

A Federated Learning Framework for Open-Source Auditory Model Development During Rehabilitation Phase of Cochlear Implant. *Puneet Lagoo, Pradeep Dheerendra*

BACKGROUND: Auditory Attention Decoding (AAD) provides a transformative framework for next-generation cochlear implants by utilizing closed-loop, neuro-steered electroencephalographic (EEG) systems. Despite this potential, the optimization of robust, generalizable deep neural network (DNN) architectures for AAD remains constrained by the paucity of large-scale, CI-specific neuroimaging datasets. This data deficit is primarily attributable to stringent data governance compliances (e.g., GDPR, HIPAA) and the substantial logistical barriers associated with high-density, closed-lab EEG acquisitions. Simultaneously, routine clinical CI rehabilitation protocols which are structurally analogous to standard AAD acoustic stimulation paradigms generate extensive yet entirely unutilized neurophysiological data.

METHODS: To resolve this bottleneck, we introduce an open-source, federated learning (FL) architecture designed to synthesize routine clinical rehabilitation with distributed AAD model optimization. Participating CI clinical centers will be provisioned with edge-compute nodes, directly interfaced with local clinical EEG acquisition and CI programming hardware. During standardized speech-in-noise (SiN) rehabilitation protocols, these local edge clients extract cortical auditory tracking features to train decentralized deep learning AAD classifiers. Utilizing an asynchronous federated orchestration server (implemented via the Flower framework), investigators can securely deploy experimental neural network topologies to the distributed clinical nodes. To ensure absolute regulatory compliance, raw neurophysiological data is retained exclusively on local edge devices; only cryptographically secured model weight differentials are aggregated at the central server.

RESULTS: The efficacy of the open-source platform was validated through the implementation of a baseline causal spatio-temporal convolutional neural network (CNN) for directional attention decoding. A global model, initially trained using a Match/Mismatch task (Binary Classification) on a public dataset of 25 subjects, was evaluated for cross-subject generalization on an independent 16-subject cohort. Within localized evaluations, the architecture demonstrated strong potential yielding cross-subject accuracies up to 73.1% and approaching the 79.4% theoretical upper bound of fully supervised, subject-specific baselines. However, broader cross-dataset evaluations reflect the inherent difficulty of transferring these models across heterogeneous EEG recording environments. Ultimately, the open-source repository provides a foundational framework for decentralized training, these findings highlight the imperative for extensive, community-wide data aggregation to mitigate local overfitting and enable robust generalization across diverse clinical populations and hardware environments.

CONCLUSIONS: Utilizing standard CI rehabilitation into a continuous, privacy-preserving federated computational grid yields a highly scalable neurophysiological data pipeline. By cultivating an open-source ecosystem, this framework decentralizes and democratizes AAD research, empowering the global neuro-engineering community to collaboratively optimize and benchmark advanced brain-computer interfaces without violating patient confidentiality or disrupting established clinical workflows.

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Decision aids do what they say on the tin: empower, improve decisional outcomes and increase uptake of hearing healthcare. *Melanie Ferguson, Ellen Bothe, Kerry Sherman, Barbra Timmer, Bec Bennett, Piers Dawes*.

Background: Despite a high prevalence of hearing loss and effective interventions, uptake of hearing healthcare is low. Factors include poor knowledge of help-seeking for hearing difficulties and sub-optimal support for decision-making. These can be addressed through clear, relevant information and guided support in decision-making.

HearChoice is an interactive, modular decision-support app that aims to personalise hearing health decision-making and empower adults with hearing difficulties by offering them choice and control over their hearing health. The research aims were to understand patient needs, develop and evaluate HearChoice and consider implementation for sustainability and scale-up in Australia.

Methods: There were four work packages (WPs) to (1) understand barriers and enablers to help-seeking and decision-making using mixed-methods, (2) co-develop HearChoice using an iterative participatory approach, (3) evaluate clinical-effectiveness and feasibility of HearChoice and an Option Grid using an RCT and process evaluation, and (4) co-design an implementation plan.

Results: WP1: identified key barriers and facilitators underpinned by the COM-B model, resulting in a framework for help-seeking and decision-making. Those who sought help had greater capability and readiness to act, and were more likely to reject negative beliefs than those who had not sought help. Key barriers were cost of hearing healthcare, gaps in hearing health knowledge, and negative beliefs. Support for HearChoice was high amongst audiologists (85%) and adults with hearing difficulties (76%). Of those interested in options other than hearing aids, 60-90% expressed an interest in a diverse range of options, suggesting missed opportunities in hearing healthcare.

WP2: co-developed the HearChoice app. Key features identified were: information on the impact of hearing loss, benefits of hearing healthcare, diverse range of hearing health options including pros and cons, and an interactive, self-guided decision-making process. User-testing showed HearChoice was highly usable, useful and impactful, and prompted behaviour change in help-seeking and decision-making

WP3: an online randomised controlled trial (RCT) allocated n=841 participants to either HearChoice or a one-page Option Grid. Decision aids improved decisional conflict and hearing-related empowerment (large effect sizes), and improved confidence and readiness to take action for hearing difficulties (medium effect sizes). At the 3-month timepoint, just over half (54%) had taken action for their hearing difficulties. When used optimally, HearChoice better prepared participants for decision-making. An ongoing process evaluation will inform interpretation of the RCT results and guide future implementation strategies.

WP4: Five audiology clinics are currently testing HearChoice clinically to understand implementation requirements and implications. Engagement with HearChoice when offered by HCPs was substantially greater than in the RCT.

Conclusion: Decision aids are useful tools to help adults with hearing difficulties seek help and make decisions about their hearing healthcare, leading to greater uptake of hearing health options. There is no one-size-fits-all approach to decision-making. HearChoice provides trusted, go-to support for those who want more detailed information on a diverse range of options and better prepares people to make decisions. However, for some people a simple option grid is comparable in most outcomes. Use of decision aids personalise hearing health choices and facilitate hearing healthcare uptake.

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Speech perception testing for the diverse population of adult cochlear implant candidates in the United Kingdom: A survey of professionals. *Catherine Killan, Sarah Somerset, Jenny Townsend*

Background. Around the world, adult cochlear implant candidacy assessments often include aided speech perception. UK government Technology Appraisal Guidance 566 states adults should score <50% phonemes on the Arthur Boothroyd word test at 70 dB(A) with hearing aids to access cochlear implantation. However, these English language word lists are not appropriate for all UK residents. A lack of guidance around assessing those who do not speak English fluently risks geographical inequity in access to implantation. Further, some aspects of English speech test administration are not specified in the guidance, risking differing implementation between clinical services and thereby inequitable access for adults who speak English also. Clinical speech perception data from different teams has been pooled for research purposes and in the UK will be monitored centrally in a National Registry for Hearing Implants. Understanding practice variation is necessary if pooled data from different teams is to be meaningfully interpreted.

The present study therefore aimed to document speech test practice for adult cochlear implant candidates in the UK. A secondary aim was to document professionals' satisfaction with current guidance and practice, along with suggestions for improvement that could inform future government guidance.

Methods. A survey was sent to all NHS-funded adult cochlear implant services during May to September 2024. Forty-three percent of eligible professionals responded, representing every UK adult cochlear implant service. Quantitative data were analysed with descriptive statistics and free-text responses by content analysis.

Results. There was high dissatisfaction with assessments for non-English speakers and wide variation in practice. Respondents called for evidence-based, validated options to equitably assess benefit from hearing aids. English-language testing varied regarding: Defining 'adult'; number of word lists per phoneme score; number of test occasions; aided conditions considered 'optimal'; calibration; allowance of item repetition; scoring; male or female list-talkers; the inclusion of sentence perception; and access to re-assessment. Professionals' suggestions included: Validated tests in other languages and/or language-independent tests; automated scoring of patient responses in languages unfamiliar to the clinician's; lower presentation level; high-quality male- and female-talker recordings; individual ear assessments; and consideration of speech perception in noise.

Conclusion. Many countries have deaf adults who are not fluent in the language(s) used locally in speech perception tests or spoken by the audiologists who score these tests. This survey's findings, including suggestions for automated scoring or language-independent cochlear implant candidacy tests are therefore of international relevance. In the UK context, this study will inform future practice guidance, candidacy research, and the design and interpretation of the National Registry for Hearing Implants."

Evaluating the Effectiveness and Usability of Assistive Resources for Hearing Impaired Students in Higher Education, Scoping Review. *Arwa Aldekhayel, Sarah Isherwood, Wendy Harrison*

Objective: An analysis to map the existing literature on assistive resources for hearing-impaired students in higher education, determine the extent of the research, and identify gaps in the knowledge.

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Introduction: With increasing numbers of students with hearing impairments enrolled in higher education, effective assistive resources are becoming more important. Approximately 466 million people worldwide suffer from hearing loss, and by 2050, the number is expected to exceed 900 million. Despite the availability of various assistive resources in higher education, such as hearing aids and speech-to-text systems, little is known about their effectiveness and usability across diverse academic settings.

Inclusion criteria: The following criteria have been used to select studies using the Population, Concept, and Context (PCC) framework. The population consisted of hearing-impaired students. The concept encompassed studies on assistive resources such as captioning, speech-to-text, and relevant applications used to assist hearing impaired students. The research context was higher education settings, such as universities and colleges. Studies focusing on students with normal hearing, other disabilities, non-assistive resource interventions, or those with hearing impairments who were not enrolled in higher education were excluded. Only English-language papers published between 2000 and 2025 were included in this scoping review.

Methods: The scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. For studies published between January 2000 and May 2025, a systematic search of five electronic databases (PubMed, MEDLINE, Cochrane Library, Scopus, EMBASE, and Google Scholar) was conducted in May 2025. Using the Population, Concept, and Context framework, two independent reviewers evaluated articles against predetermined inclusion and exclusion criteria. Data analysis was conducted using a standardized form, and a narrative synthesis was performed with a critical appraisal using the Mixed Methods Appraisal Tool (MMAT).

Results: Search results yielded 962 records. Seven studies met all inclusion criteria, including two reviews, one mixed-methods study, one qualitative study, and three quantitative studies. Between 2000 and 2025, there were four studies from the United States (n = 5), one from Nigeria (n = 1), and one from Indonesia (n = 1). There is a small but growing body of research that supports the positive impact of assistive resources, especially speech-to-text systems, on academic performance and classroom participation. The effectiveness of assistive resources in enhancing learning outcomes, the significance of students' views and usability, and the vital role of institutional support are among the key themes. As a result of critical appraisals, small sample sizes, no control groups, and inconsistent outcome measures, the included studies were identified as having methodological limitations.

Conclusion: Currently available evidence suggests that assistive resources can support hearing-impaired students in higher education. It is clear, however, that there is a need to conduct more rigorous, large-scale, and longitudinal research to develop a more robust evidence base. In future research, comparative effectiveness studies, diverse student populations, standardized outcome measures, and emerging supporting technologies should be prioritized. The development of consensus on best practices for implementing assistive resources is crucial to guiding institutional policy and ensuring equitable access to resources for students with hearing impairments.

A mixed-methods investigation of hearing loss and well-being in the social workplace. *Jack Holman, Laura Marples*.

It is well documented that hearing loss often results in poorer employment and workplace outcomes. We also know through work from the Royal National Institute for Deaf People that support in the workplace is underutilised, and hearing loss is often not disclosed to colleagues and/or management. We still have little insight into how hearing loss impacts the well-being of

workers, the specific factors responsible and how improvements can be made. This study used a mixed methods approach to highlight the impact of hearing loss on well-being in the workplace and the role of structural, individual and relational factors.

Through quota sampling we recruited 40 participants experiencing the full range of hearing loss (mild to profound) who work at least 16 hours per week. Participants completed one week of ecological momentary assessment in the workplace via smartphone. We investigated the impact of workplace structure related factors (e.g. industry and workforce size), individual factors (e.g. hearing handicap and workplace assistance) and relational factors (e.g. support and disclosure of hearing loss) on well-being factors throughout the day and in the evening.

We then used semi-structured interviews to gather more information regarding the experience of having a hearing loss in the workplace, with a particular focus on disclosure/non-disclosure of hearing loss and opportunities for/utilisation of workplace assistance.

We identified that individuals who experience greater hearing handicap and participation restrictions were more likely to report negative outcomes for self-reported productivity, fatigue, social connectedness and emotion in both social and formal situations during the working day. There was evidence that factors such as control and managerial responsibility can affect experiences and behaviour in the workplace, but the factor which had the strongest relationship to various aspects of workplace well-being was social support in the workplace. The qualitative findings elucidate the underlying mechanisms of how hearing loss influences different aspects of workplace well-being, while highlighting the importance of supportive environments, key decisions behind disclosure of hearing loss in the workplace (including the difference between cochlear implants and hearing aids), and the identification of gaps in knowledge transfer for workplace support and adjustments.

Investigating the management of paediatric cochlear implant candidates with potentially useable pre-operative hearing in Victoria state. *Yuhan Wong, Karyn Galvin, Jaime Leigh, Karolina Kluk*

Background: Paediatric cochlear implant (CI) candidacy has expanded to include children with significant pre-operative hearing. Current surgical techniques aim to preserve intracochlear structures, which may maintain access to future regenerative treatments, but also enables the use of residual acoustic hearing alongside the cochlear implant. However, the benefits of combining acoustic and electric hearing in the paediatric population are not well-documented. Usage rates of electroacoustic stimulation (EAS) devices reported in the literature are low, and there is a lack of clinical guidance on the management of paediatric CI recipients with useful residual hearing. At the Royal Victorian Eye and Ear Hospital (RVEEH), candidacy criteria for paediatric cochlear implantation includes children with residual hearing and surgeries are done with the view of preserving hearing and inner ear structure. This presents an opportunity to study investigate the clinical management of paediatric CI candidates with potentially usable pre-operative hearing.

Methods: A retrospective case-note review was conducted via the RVEEH electronic medical records system for paediatric CI recipients aged under 18 implanted between 2015 and 2024. Inclusion criteria required pre-operative thresholds of ≤80 dBHL at 250Hz or 500Hz. Cases were excluded if their notes were incomplete (missing pre-op notes, pre-op audiogram or post-op notes). Primary outcome measures include documentation of residual hearing and EAS discussions during pre-implant counselling and post-operative management, and EAS fitting rates. Where available, post-operative threshold measurements were also extracted, and the level of hearing preservation calculated using the HEARRING formula.

Results: Records of 487 patients (740 implanted ears) were extracted for screening. 171 ears from 142 unique patients were found to meet the inclusion criteria. The cohort had an average age at surgery of 5.48 years (range: 0.8-17.9) and average pre-operative thresholds of 60.8 dBHL at 250Hz and 70.4dBHL at 500Hz. Documentation of discussions regarding residual hearing or EAS was found for 65 cases (38%), and these frequently focused on the risk of losing hearing during surgery. Hybrid speech processors were ordered for 33 cases (19%) and post-operative thresholds measurements were available for 43 cases (25%). EAS was trialled for 16 ears and used for more than 6 months in 12 ears. The level of hearing preservation is still under analysis and will be reported.

Conclusion: This research highlights a gap between the practice of hearing preservation cochlear implantation and the monitoring and use of preserved residual hearing in paediatric CI recipients. The findings shed light on current clinical practices surrounding residual hearing in children and identify potential barriers to the adoption of EAS. They will also help to shape clinical guidance to maximize the benefits of preserved acoustic hearing in the paediatric population.

Auditory Function Following Sport-Related Concussion and Repetitive Head Impacts: A Scoping Review. *Ewan Dean, Jessica Andrew, John Oyewole, Christopher Gaffney, Helen Nuttall, Kate Slade*.

Introduction: Head impacts are common in sport, and auditory symptoms, like difficulty understanding speech-in-noise, tinnitus, and hyperacusis, are frequent yet overlooked symptoms of concussion. Repetitive head impacts are further linked to neurodegenerative diseases, highlighting the need for sensitive, accessible biomarkers.[SK1.1] Despite the prevalence of these auditory symptoms[SK2.1], auditory assessment remains absent from concussion protocols, representing both a scientific gap and a missed opportunity for more accessible brain health monitoring. Auditory processing relies on precisely timed subcortical and cortical neural transmission, making it vulnerable to diffuse axonal injury and the neurometabolic cascade of concussion. The auditory cortex lies within the lateral sulcus, a region highly vulnerable to concussive impacts. This vulnerability suggests auditory measures may provide a window into concussion-related neuropathology.

Methodology: To explore how sports-related head impacts affect auditory function, a scoping review was conducted. Eligible studies assessed auditory function in athletes following concussive, sub-concussive, or repetitive head impacts in sport. Thirty-one studies met the inclusion criteria.

Findings: Peripheral hearing, assessed by pure tone audiometry,[SK3.1][DE3.2] remained within clinically normal limits, yet central auditory processing deficits emerged within hours to years' post-concussion. Subcortically, speech-evoked frequency following responses showed reduced fundamental frequency amplitude. Cortically, N100 amplitude reductions suggest early disruption of auditory processing. Higher-order auditory function, measured with auditory oddball paradigms, demonstrated reduced P300 amplitude, even after symptoms had resolved, with persistent abnormalities observed up to 35 years post-head impact exposure in former athletes. Contact sport participation was also associated with poorer speech-in-noise performance, elevated rates of tinnitus, and noise sensitivity.

Discussion: The evidence base reveals substantial gaps. Twenty-eight of thirty-one studies originated from North America, limiting generalisability and indicating scope for international replication. The sex imbalance is notable. 2,100 male versus 601 female athletes were represented. Twelve studies recruited males exclusively, none recruited females exclusively, and only one reported menstrual cycle phase or contraceptive use. This is a critical oversight.

Females sustain concussion at higher rates in sex-comparable sports, report greater somatic symptom burden, and face longer recovery trajectories. Sex differences in auditory processing are well documented, with oestrogen specifically influencing harmonic encoding. Yet females remain critically underrepresented. As do elite and retired athletes, with only four and three studies focused on these groups, respectively, despite facing the greatest cumulative exposure to repetitive head impacts and more acute return-to-play pressures. Despite converging evidence, auditory assessment remains absent from multimodal concussion management protocols. The auditory system represents an underutilised biomarker of concussive-related neuropathology, with direct implications for monitoring brain health and protecting the perceptual and communicative function of athletes across career stages and demographics.

The Importance of Culture and Healthcare Infrastructure When Considering First-Time Hearing-Aid Purchase. *Lena Wong, Huili Zheng*

Purpose: Timely hearing-aid adoption can improve older adults' wellbeing, yet approximately 66.8 million older adults in mainland China have moderate-or-greater hearing loss and hearing-aid uptake remains below 10%. In mainland China, where hearing aids are usually self-funded, purchase is a prerequisite to adoption and is shaped by a distinctive service context: scarce audiologists, informal ENT-to-dispenser referral, non-mandatory dispenser licensing, limited subsidies and weak trial/refund protection. This research examined barriers and facilitators reported by older adults, together with dispensers' perspectives, to understand the process leading to first-time hearing-aid purchase while taking into account older adults' perceptions, attitudes, preferences and experiences, as well as hearing care infrastructure and culture.

Methods: Evidence came from three studies: interviews with 12 older adults who had consulted ENTs but had not adopted hearing aids; interviews with 19 first-time and experienced purchasers; and a national survey of 1,537 hearing-aid dispensers across 285 cities. Findings were synthesised to describe the journey from initial help-seeking to uptake and interpreted in relation to previous literature, including ChinaTrak and international Trak/MarkeTrak consumer-survey findings.

Results: The studies reviewed that desire for a medical cure, low perceived need, negative impressions and misconceptions about hearing aids, and concerns about benefit and cost, delayed hearing aid adoption. Families, particularly adult children, played a pivotal role by encouraging purchase, searching for information, arranging and accompanying visits and trials, and paying for devices. ENTs legitimised help-seeking by confirming the need for hearing aids and explaining that hearing loss could not be cured medically. Dispensers helped convert intention into purchase through respectful communication, reliable information, fitting skill, demonstrations and trial experience. Across studies, benefits were evaluated against affordability, consistent with previous work on perceived hearing-aid value and cost-benefit considerations.

Conclusion: The studies revealed similarities with previous literature: perceived need, expected and experienced benefits, information, professional advice, cost and family support all influenced hearing-aid uptake. Contexts that have not been emphasized in previous literature reported in Western societies include focus on seeking cure, adult children being treatment and financial co-decision-makers, reliance on trusted medical authority and word-of-mouth referral, limited subsidies, lack of trained professionals and lack of trial/refund protection. The process to first-time hearing-aid purchase in mainland China and probably other countries is therefore influenced by culture and hearing care infrastructure that could only be revealed if research studies are contextualized and relevant information is collected.

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Association Between Organic Solvents Exposure and Hearing Impairment in Automotive Maintenance and Refinishing Shops: Literature Review. *Thamoonlek Chatchai, Martie van Tongeren, Andrew Povey, Garreth Prendergast, Siobhan Brennan*

Introduction: Hearing impairment continues to pose a significant global health challenge worldwide. In occupational environments, prolonged noise exposure is a well-established cause of hearing loss. Additionally, research in humans suggests that exposure to certain chemicals, particularly organic solvents such as toluene and styrene, may also contribute to auditory impairment. The rapid expansion of the automotive industry in Thailand requires the establishment of a comprehensive supporting ecosystem, encompassing both maintenance and refinishing services. Paint sprayers working in automotive maintenance and refinishing shops are exposed to solvents widely used in paints and coatings, as well as to noise generated by equipment and workplace activities. Nevertheless, there is limited evidence regarding the effects of solvent exposure and the combined exposure to solvents and noise on hearing in this occupational setting.

Objectives: To understand how occupational exposure to organic solvents impacts hearing among workers in automotive maintenance and refinishing shops and to identify gaps for future research in this context.

Methods: Articles involving human participants, published between January 2005 and May 2025 in PubMed, Embase, and Web of Science in the English language, were screened in this review. The selected studies met the inclusion criteria, which comprised hearing loss or hearing thresholds, audiological tests administered, and exposure to organic solvents. The search strategy included terms for solvents (e.g., toluene) and auditory effects, specifically hearing loss. In addition, a further search of the Thai journals database was also performed to identify studies relevant to the local context. The Newcastle-Ottawa Scale was adopted to assess research quality.

Results: Nineteen out of 585 articles assessed as fair or good quality were included. More than half of them were conducted in Asia, while 25% were conducted in North America and 10% in Europe. Four studies were conducted in Thailand. Of these, three examined solvent exposures through air sampling and biological monitoring in automotive maintenance and refinishing shops, and one focused on metal can and paint factories. Among these included articles, 15 examined hearing loss. Pure-tone audiometry was the most frequently employed test, while only two studies used additional hearing tests, such as the distortion-product otoacoustic emission test and the auditory brain stem response.

Discussion: Epidemiological investigations suggest that solvent exposure may affect high frequencies, commonly around 3.0 – 8.0 kHz, and may progress to lower frequencies with continued exposure, although a clear dose-response relationship has not been established. Furthermore, evidence suggests that combined exposure to solvents and noise may elevate the risk of hearing loss. Despite these findings, research on occupationally exposed workers in automotive maintenance and refinishing shops remains limited. Previous studies of solvent exposure in this industry in Thailand have primarily examined exposure levels and respiratory and neurological health effects. As a result, the understanding of the effect on hearing from solvent exposure and the effects of combined exposure to solvents and noise in this population remains insufficiently investigated. Thus, further research on the association between solvent exposure and hearing impairment, using both audiometry and alternative hearing tests in this occupational setting, is needed.

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Supporting Listening and Learning: The effectiveness of assistive listening devices (ALDs) in children with bilateral mild-to-moderate hearing loss. *Lynne Blair, David Maidment, Maya Roberts, Hannah J Stewart*

Assistive listening devices (ALDs), for example wireless remote microphones, have been proven to be effective supportive technology for children with listening difficulties (e.g., Stavrinos et al., 2020 in their clinical trial NCT02353091). Our patient and public involvement engagement workshops with deaf children have highlighted that children with MMHL are increasingly recommended to use ALDs in school and that these are funded by the Department of Education via local authorities. In 2025 the Assistive Listening Technology Working Group published the new quality standards for assistive listening technology in partnership with the National Deaf Children's Society.

Here we present our systematic review evaluating the effectiveness of ALDs for children with bilateral mild to moderate hearing loss (MMHL) aged 1 to 18, particularly in acoustically challenging environments such as classrooms. We prospectively registered the systematic review (PROSPERO 2025 CRD420251084455). Given substantial heterogeneity across populations, interventions and outcomes, synthesis without meta-analysis was undertaken using a staged approach comprising descriptive summaries and thematic groupings.

Four eligible studies were included, encompassing experimental, quasi-experimental and longitudinal designs, with a total n = 27 children with bilateral MMHL across the four studies. Only one (longitudinal) study focused exclusively on children with mild bilateral hearing loss. This study (Kam & Tong, 2026) found that the ALD group showed significantly greater improvements in overall language ability and consonant articulation than the hearing aid and control groups. In the other three studies (Anderson et al., 2005; Mulla et al., 2014; Tronstad et al., 2022), children with MMHL were identified as subgroups within broader hearing loss cohorts, resulting in very small subgroup sample sizes where evidence was sparse and inconsistent, precluding meaningful comparison with ALD systems compared to other technologies. Broad severity categories and imprecise audiometric profiling appeared to dilute configuration-specific benefit.

We concluded that current evidence for ALDs in children with MMHL is extremely limited and heterogeneous, constraining confidence in generalisable effect estimates. Progress in this field requires systematic disaggregated severity categories and detailed auditory profiling, in addition to careful selection of outcomes that support access and developmental change. Given the high prevalence of MMHL in childhood and the central role of communication access in long-term educational outcomes, this evidence gap is a pressing research priority.

A qualitative investigation of the barriers and facilitators to managing hearing loss for older adults living with frailty. *Liz Graham, Alexandra Farrell, Anne Forster, Ronan McGarrigle, Rahena Mosabir, Chris Quinn, Lesley Brown*

Background. Both hearing loss and frailty are common in older adults. Frailty is characterised by low grip strength, low energy, and low physical activity - all of which could make managing hearing loss challenging. Hearing loss or frailty can result in poorer quality of life, increased depression, and falls; however, little is known about the specific challenges faced by community-dwelling older adults living with both hearing loss and frailty and the support they need to more effectively manage their hearing.

Aims. We aim to explore barriers and facilitators to managing hearing loss for older people living with frailty to help identify ways to better meet their support needs.

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Design and methods. We are conducting in-depth qualitative interviews with older adults (≥ 65 years) living with hearing loss and frailty. We aim to purposively sample and recruit 25 older adults, ensuring variation in gender, socioeconomic deprivation, levels of frailty, ethnicity and living circumstances. For some participants we will involve their spouse or family member (communication partner) in a dyadic interview to understand their 'support' role. Potentially eligible participants - identified from established cohort studies that capture data on hearing loss and frailty - are sent postal invitations. Additional recruitment is taking place from community groups to ensure diversity within our sample. Interview topics include motivations for seeking hearing support (or not), experience with audiology services (if attended), challenges to using hearing aids, and any beneficial support received. Additional areas of inquiry cover their awareness of hearing support technologies (e.g. specialised doorbells) and participants' priorities for managing their hearing loss. A Patient and Public Involvement (PPI) group meets regularly to advise on the suitability of study materials, to inform topic guides, and to support analytic interpretation.

Data will be thematically analysed using the "Burden of treatment" theory to understand the additional effort required by older adults with frailty to manage hearing loss. Themes will be developed iteratively and agreed through research team and PPI group discussions. Case study vignettes will be developed from the findings for use in an end of study workshop involving older adults and audiologists. Vignettes will depict 'fictionalised' experiences of the barriers and facilitators to managing hearing loss, and will support the workshop aim of exploring potential areas for intervention development.

Findings and impact. We will present emerging insights from our work, describing early themes derived from our interviews.

At the end of the study, we plan to translate findings from participant interviews and the workshop into actionable recommendations for older adults, audiologists, other health and care practitioners, and academics. Findings will also inform plans for the development of new interventions to support older adults with frailty and hearing loss.