British Society of Audiology Annual Conference 2017 –
Online Conference Information
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Welcome to Conference

We are delighted to welcome you to the British Society of Audiology Annual Conference 2017. For anyone with an interest in hearing and balance, the 2017 BSA conference will be a wonderful culmination of vibrant current and future work.

The conference remains the leading UK scientific forum to bring together clinicians and researchers who have an interest in hearing, tinnitus and balance. Our aim is to make the conference an enjoyable experience for you, but also an effective learning environment and networking opportunity. Held at the glorious Majestic Hotel in Harrogate on Thursday 29th and Friday 30th of June 2017 the theme of the conference is Audiology and the Greater Good. This theme aims to help us contextualise Audiology, focus on how Audiology fits within the wider experience of someone’s life and consider the impact of what we do alongside all of the professional disciplines within hearing and balance science. Hot topics this year include exploration of the latest technology and implantable devices, comorbidities, integrated care and Audiology’s relationship with the justice system.

Our goals for this year’s conference are:

• To present perspectives within audiology and provide up to date information on current and future research
• To offer a range of knowledge and experience
• To facilitate collaborative, interactive learning across all of the disciplines involved in hearing and balance science

After the success of our revamped programme last year we have a strong focus around the extensive work of the Special Interest Groups (SIGs) and developments within Basic Science, these will be showcased on day 2 which will be a great opportunity to find out how to deepen your knowledge in particular areas of interest and get more involved. We now have 8 SIGs! These specialisms are; Cognition and Hearing, Balance, Paediatrics, Adult Rehabilitation, Auditory Processing Disorder, Tinnitus & Hyperacusis, Global Outreach, and Electrophysiology.

Some aspects of the programme you can look forward to include each SIG running a varied session with some hosting traditional lectures, others providing workshops with case studies and journal club approaches so that the conference is interactive, providing you with a positive learning experience.

The conference also promises to be a fantastic opportunity for meeting a broad network of professionals, each with a diverse range of experience, as well as the exhibition from the industry and third sector professionals. The presenters at the exhibition are also looking forward to sharing
their latest research and we look forward to the submission of high quality and wide ranging abstracts. In addition to oral presentations, there will also be posters with a dedicated timetabled session to allow thorough discussion with the authors. We had a great response last year with our call for abstracts, please consider submitting one on your research and work.

Look out for updates on UK, European and international experts spanning emerging research to current clinical practice. Overall, the conference programme presents opportunities for individuals across a range of disciplines and backgrounds to engage and share their knowledge and expertise and we hope you enjoy the next two days.

**BSA Chair:** Elizabeth Midgley  
Consultant Clinical Scientist,  
University Hospitals Bristol

**BSA Conference Lead:** Laura Turton  
Operations Manager, British Society of Audiology
Conference Programme Committee

Dr Siobhán Brennan  BSA Programme Committee Lead/Lead Clinical Scientist/Lecturer at Sheffield Teaching Hospitals

Dr Amanda Hall  Research Fellow in Social and Community Medicine, University of Bristol

Dr Melanie Ferguson  Consultant Clinical Scientist, Research Lead (Habilitation for hearing loss); Honorary Associate Professor, Nottingham Hearing Biomedical Research Unit

Dr Christian Füllgrabe  Investigator Scientist, MRC Institute of Hearing Research, University of Nottingham

Dr David Greenberg  Research Associate in Auditory Neuroscience and Clinical Audiologist at the UCL Ear Institute

Special Interest Group Leads:

Dr Derek Hoare  Tinnitus and Hyperacusis

Dr Piers Dawes  Cognition and Hearing

Dr Melanie Ferguson  Adult Rehabilitation

Katy Morgan/Andrew Wilkinson  Balance Interest Group

Verity Hill  Paediatric Audiology

Dr Nicole Campbell  Auditory Processing Disorder

Gemma Twitchen  Global Outreach
Fifty years of the BSA – Social Evening and Awards Ceremony

As you may be aware, the British Society of Audiology is celebrating its 50th anniversary. This theme will be encompassed during the social evening on Thursday 29th June. This event will take place within the Majestic Hotel, tickets come at a cost of £25pp. Everyone is welcome to join us in the Carriage Suite at 19:30 for an arrival drink and a 2 course hot fork buffet. The night will unravel into the 50th celebrations – looking at times gone by in the BSA and hearing from some important figures from this Society. The evening will conclude with the official awards ceremony.

Please remember to dress smartly.

(If you would like to attend this event but do not yet have a ticket, please see a member of the Fitwise staff at the registration desk as there may be some left over)
Gold Sponsors

We would like to extend a huge thank you to our corporate Gold Sponsors:

**oticon**

*People First*

**Gold Sponsor**

**otometrics**

*a division of natus*

**Gold Sponsor**

Please be sure to visit them at their stands. (See page 144 for all exhibitor information)
Important Information

Venue:
Majestic Hotel
Ripon Road
Harrogate
North Yorkshire
HG1 2HU
Tel: +44 (0) 1423 700 300

Registration Times:
Thursday 29th June: 08:00-09:00
Friday 30th June: 08:30-09:00

There will be a member of Fitwise staff at the registration desk at all times.

Notice Board/Announcements
If you have any announcements to be made or would like to post any notices, there will be a board available beside the registration desk.

Conference App
There will be no printed handbook distributed this year. However there is a conference app (as well as this printable PDF). To access the app, first download the ‘EventsAIR’ app from the app store. Once you have this app, open and enter event code ‘BSA17’. You will then have access to the conference app. If you have any queries, please see a member of Fitwise staff.

Disabled Access
There is ramp access to the rear of the building. Lifts can be found inside.

Badges
Badges should be worn at all times. This will allow access to the conference sessions and exhibition.

Conference and Exhibition Feedback
Delegates are encouraged to complete the survey that will be sent to them post-conference. This will help provide useful information for planning the 2018 conference.
CPD Points/Certificate of Attendance
Please note: There is no CPD accreditation for attending this event. However, you will receive a certificate of attendance after the event. These will be sent electronically using the email address you registered with.

Mobile Phones
Please ensure all mobile phones are switched off or left on silent mode during conference sessions. Thank you.

Wifi
Wifi is free throughout the venue and accessible to all.

First Aid
If you require first aid assistance please contact one of the Majestic Hotel or Fitwise staff. Dedicated first aiders will be onsite throughout the event.

Annual General Meeting

The British Society of Audiology Annual General Meeting (AGM) will be held on Friday 30th June from 13:30-14:15 in the Carriage Suite. Members and non-members are welcome to attend. (However, only members will be eligible to vote). Why should you attend the AGM?

- This will give you the opportunity to familiarise yourself with the faces of the BSA
- You will be informed of any changes in council
- To be kept up-to-date with the latest developments within the BSA
- This meeting is open to both BSA members and non-members (however, only members can vote)
- You will gain a better understanding of the BSA’s strategic plan

Passport Competition

There will be a stand competition taking place at conference this year. Inside your delegate bag you will find a ‘passport’ form. This form details all exhibitors that are involved in the competition. You must visit these stands and get your form signed or stamped. Once your form is complete, please bring to the registration desk or give to a member of the Fitwise team – no later than morning break on Friday 30th June. Winners will be announced at the registration desk during lunch on Friday 30th.
Catering
Thursday 29th June:
08:00-09:00 – Refreshments
10:00-10:30 – Refreshments
12:30-13:30 – Lunch
20:30 – 2 course buffet at social evening (**see the 50th anniversary information on page 5 for information on tickets for this)

Friday 30th June:
08:30-09:00 – Refreshments
10:30-11:00 – Refreshments
12:30-13:00 - Lunch

The British Society of Audiology’s Secretariat
The organising secretariat for the conference is:
Fitwise Management Ltd | Blackburn House | Redhouse Road | Seafield | EH47 7AQ
Tel: +44 (0)1506 811 077  bsa@thebsa.org.uk
## Conference Programme

### Thursday 29th June 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>08:00-09:00</td>
<td>Registration in main foyer, poster &amp; exhibition viewing</td>
<td>Carriage Suite</td>
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<tr>
<td>09:00-09:10</td>
<td>Conference Welcome and Happy 50th Year to the BSA: Elizabeth Midgley, Chair, British Society of Audiology</td>
<td>Carriage Suite</td>
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<tr>
<td>09:10-10:00</td>
<td>Hot Topics: Comorbidities and Epidemiology</td>
<td>Carriage Suite</td>
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<td>Chair: Dr Amanda Hall</td>
<td>Carriage Suite</td>
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<tr>
<td>09:10-09:40</td>
<td>Hearing, Cognition and Healthy Aging</td>
<td>Carriage Suite</td>
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<td>Keynote: Dr Frank Lin</td>
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<td>Johns Hopkins University, Baltimore, USA</td>
<td>Carriage Suite</td>
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<tr>
<td>09:40-10:00</td>
<td>Coupling and Uncoupling of Vestibular Perceptuo-reflex in Healthy Participants and Patients with Head Trauma</td>
<td>Carriage Suite</td>
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<td>Elena Calzolari</td>
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<td>Imperial College London</td>
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<tr>
<td>10:00-10:30</td>
<td>Coffee break, posters &amp; exhibition viewing</td>
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<td>Drawing Room</td>
<td>French Restaurant</td>
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<tr>
<td>10:30-11:35</td>
<td>Service Development and Professional Issues</td>
<td>Carriage Suite</td>
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<td>Chair: Dr Melanie Ferguson</td>
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<tr>
<td>10:35-10:50</td>
<td>Public Health Approaches to Addressing Hearing Loss in Adults</td>
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<td>Dr Frank Lin</td>
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<td>Johns Hopkins University, Baltimore, USA</td>
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<td>10:50-11:05</td>
<td>The Role of Audiologists in Primary Care - The Welsh Experience</td>
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<td>Nicola Phillips</td>
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<td>Abertawe Bro Morgannwg</td>
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<td>University Health Board, Port Talbot</td>
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<td>Free Paper</td>
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<td>Perceived and Actual Hearing Difficulty Predict Self-reported</td>
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<td>Listening Effort and Self-reported Fatigue</td>
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<td>Sara Alhanbali</td>
<td>Carriage Suite</td>
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<td>11:05-11:20</td>
<td><strong>Commissioning, Cost-Effectiveness and Cuts</strong>&lt;br&gt;Gemma Twitchen&lt;br&gt;Action on Hearing Loss, London</td>
<td>(Video link presentation)&lt;br&gt;Why Does Speech Understanding Vary Among Adult Cochlear Implant Recipients?&lt;br&gt;Professor Colette Mckay&lt;br&gt;Bionics Institute&lt;br&gt;Melbourne, Australia</td>
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<td>11:20-11:35</td>
<td><strong>Free Paper</strong>&lt;br&gt;Sound-Quality Ratings of Traditional and Over-the-Counter Amplification Products Obtained Under Real-World- and Laboratory-listening Conditions&lt;br&gt;Professor Amyn Amlani&lt;br&gt;University of Arkansas/University of Arkansas at Little Rock, USA</td>
<td>Cochlear Implant Care: Putting Patients in Charge&lt;br&gt;Dr Helen Cullington&lt;br&gt;University of Southampton</td>
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<td>11:35-12:30</td>
<td><strong>Poster Viewing Session</strong></td>
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<td>12:30-13:30</td>
<td><strong>Lunch &amp; Exhibition Viewing</strong></td>
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<td>13:30-14:00</td>
<td><strong>Chair: Carmel Capewell</strong>&lt;br&gt;Hot Topics in Audiology: Mental and Cognitive Health</td>
<td>Multidimensional and Patient Centred Approaches to Mental Health and Cognitive Impairment&lt;br&gt;Keynotes: Dr Nicola Wright and Dr David Charnock&lt;br&gt;Faculty of Medicine &amp; Health Sciences, University of Nottingham</td>
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<td>14:00-14:15</td>
<td><strong>Dementia and Sensory Challenges</strong>&lt;br&gt;Agnes Houston&lt;br&gt;Living with Dementia and Churchill Fellow</td>
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<td>14:15-14:30</td>
<td><strong>Free Paper</strong>&lt;br&gt;Are Changes in Sensory Function Associated with Cognitive Decline? Longitudinal Analysis in European Older Population&lt;br&gt;Dr Piers Dawes&lt;br&gt;University of Manchester</td>
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<td>14:30-15:00</td>
<td><strong>Tea break, posters &amp; exhibition viewing</strong></td>
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<td>15:00-16:35</td>
<td>Integrated Care and Patient Centred Practice</td>
<td>Audiology and the Justice System</td>
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<td>Chair: Elizabeth Midgley</td>
<td>Chair: Dr Siobhán Brennan</td>
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<td>15:05-15:25</td>
<td>The Relationship Between Sensory Impairment and Cognitive Function in Older Age: Impacts on Engagement and Active Ageing</td>
<td>Hearing Loss in Prison: An introduction</td>
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<td>15:25-15:45</td>
<td>(Video link presentation) Parental involvement: Implications of Family-Centred Care in Audiological Settings</td>
<td>Challenging Behaviour, Hearing Loss and the Justice System</td>
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<tr>
<td>15:45-16:05</td>
<td>(Video link presentation) Provision of Patient-Centred Care for Adults with Hearing Loss: Implications for Audiologists and Their Patients</td>
<td>Setting up an Audiology service at HMP Berwyn, the UK’s largest Prison</td>
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<td>16:05-16:20</td>
<td>Integrated Care and Patient Centred Practice</td>
<td>NIHL and Medico-Legal Considerations in Audiology</td>
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<td>16:20-16:35</td>
<td>Free Paper Paediatric Vestibular Assessment: a 2 Year Retrospective Review</td>
<td>Q&amp;A Panel Session</td>
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<td>Paediatric Audiology Interest Group</td>
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<td>Adult Rehabilitation Interest Group Workshop</td>
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<td>Chair: Verity Hill</td>
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<td>Inspiring AR audiologists: The Rules of Attraction</td>
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<td>Chair: Dr Melanie Ferguson</td>
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<td>Chair: Andrew Wilkinson</td>
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<td>Balance and the Greater Good</td>
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<td>09:00-09:30</td>
<td>Radio aids at first hearing aid fitting</td>
<td>Professor Wendy McCracken</td>
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<td>(Video link presentation)</td>
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<td>09:30-10:00</td>
<td>Testing for Congenital Cytomegalovirus (CMV) in Babies Identified with</td>
<td>Kate Johnston</td>
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<td>Permanent Childhood Hearing Impairment (PCHI) Through the Newborn</td>
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<td>Hearing Screening Programme</td>
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<td>(Video Link Presentation)</td>
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<td>Language Matters: What You Say and How You Say It</td>
<td>Professor Louise Hickson</td>
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<td>10:00-10:15</td>
<td>Moving Beyond the Warble Tone: The Hummingbird Clinic and Assessment</td>
<td>Keiran Joseph</td>
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<td>of Children with Autism and Complex Needs</td>
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<td>Free Paper</td>
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<td>10:15-10:30</td>
<td>Vestibular Assessment in Children</td>
<td>Dr Soumit Dasgupta</td>
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<td>10:30-11:00</td>
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<td>11:00-12:30</td>
<td>Cognition and Hearing Special Interest Group Workshop</td>
<td>Global Outreach Special Interest Group</td>
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<td><strong>Chair:</strong> Dr Piers Dawes</td>
<td><strong>Chair:</strong> Gemma Twitchen</td>
<td><strong>Chair:</strong> Dr Derek Hoare</td>
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<tr>
<td>New BSA Clinical Guidelines for i) Adults with Learning Disability and ii) Dementia: Need, Evidence and Development</td>
<td>Stories, Adventures, Challenges and Successes from Those Working to Make a Difference For People Globally with Hearing Loss</td>
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<tr>
<td><strong>Learning Disabilities</strong></td>
<td><strong>11:00-11:10</strong></td>
<td><strong>11:00-11:10</strong></td>
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<tr>
<td><strong>Multidisciplinary Engagement for Adults with Learning Disabilities</strong></td>
<td>Introduction to the Session and the Global Outreach Specialist Interest Group</td>
<td>Towards equity of tinnitus management across the UK National Health Service</td>
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<td>Dr Lynzee McShea</td>
<td>Gemma Twitchen</td>
<td>Dr Derek Hoare</td>
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<td>City Hospitals Sunderland NHS Foundation Trust</td>
<td>Action on Hearing Loss, London</td>
<td>NIHR Nottingham Biomedical Research Centre</td>
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<td><strong>11:10-11:20</strong></td>
<td><strong>11:05-11:20</strong></td>
<td><strong>11:00-11:10</strong></td>
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<tr>
<td>Scope and Reach of Guidelines for Audiological Practice for Adults with ID</td>
<td><strong>Video Link Presentation</strong></td>
<td>Towards equity of tinnitus management across the UK National Health Service</td>
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<tr>
<td>Dr Siobhán Brennan</td>
<td>Service Developments in Malawi</td>
<td>Dr Derek Hoare</td>
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<td>Sheffield Teaching Hospitals, University of Manchester</td>
<td>Helen Brough</td>
<td>NIHR Nottingham Biomedical Research Centre</td>
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<td><strong>11:20-11:30</strong></td>
<td><strong>11:20-11:30</strong></td>
<td><strong>11:10-11:35</strong></td>
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<td>Audiology Services for Adults with Intellectual Disabilities: The Patient Perspective</td>
<td>Global Outreach SIG: Deafness in the 21st century: low and Middle-income countries – creating a MOOC to raise awareness</td>
<td>Tinnitus Guidance and a Quality Standard for Scotland</td>
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<td></td>
<td>Helen Chilton</td>
<td>Dr William Whitmer</td>
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<td></td>
<td>University of Manchester</td>
<td>Office Institute of Hearing Research - Scottish Section, Glasgow</td>
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<td><strong>11:30-11:45</strong></td>
<td><strong>11:35-11:55</strong></td>
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<td></td>
<td><strong>Workshop on Recommended Procedure for Fitting Combination Hearing Aids for Tinnitus</strong></td>
<td><strong>Workshop on Recommended Procedure for Fitting Combination Hearing Aids for Tinnitus</strong></td>
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<td>Dr Magdalena Sereda</td>
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<td>11:30</td>
<td><strong>Dementia</strong></td>
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<td>11:30-11:35</td>
<td>BSA Guidelines: Audiology for Adults with Dementia</td>
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<td></td>
<td>Dr Sarah Bent</td>
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<td>Wrexham Maelor Hospital</td>
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<td>11:35-11:45</td>
<td>Current Evidence Base and the SENSE-Cog Research Programme</td>
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<td>Dr Piers Dawes</td>
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<td>University of Manchester</td>
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<td>11:45-11:55</td>
<td>An exploratory study of the experiences of informal carers supporting individuals when their spouse has dementia and hearing loss</td>
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<td>Vicky Sadler</td>
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<td>Shropshire and Telford Hospitals NHS Trust</td>
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<td>11:55-12:30</td>
<td>General Panel Discussion</td>
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<td>12:30-13:20</td>
<td>Lunch, poster &amp; exhibition viewing</td>
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<td>Dr Helen Pryce</td>
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**Participants:**
- Dr Sarah Bent
- Wrexham Maelor Hospital
- Dr Piers Dawes
- University of Manchester
- Vicky Sadler
- Shropshire and Telford Hospitals NHS Trust
- Cherith Campbell-Bell
- Cochlear Europe Ltd
- Dr Graham Naylor
- MRC/CSO Institute of Hearing Research - Scottish Section, Glasgow
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<td>15:30-15:55</td>
<td>Design of a Cheap Easily Usable Experimental Hearing Aid</td>
<td>Professor Stefan Bleeck, University of Southampton</td>
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<td>15:55-16:00</td>
<td>Applying Just Noticeable Differences to Hearing Aid Fittings</td>
<td>Dr William Whitmer, MRC Institute of Hearing Research, Glasgow</td>
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<td>16:00-16:15</td>
<td>Towards The Use of Automatic Speech Recognition for the Fine-Tuning of Hearing Aids</td>
<td>Dr Lionel Fontan, Archean Technologies, Montauban, France</td>
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<td>16:15-16:30</td>
<td>The threshold ABR high-pass filter re-visited: an old chestnut served up in a new way</td>
<td>Dr Guy Lightfoot, ERA Training Ltd, Liverpool</td>
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<td>16:30-16:45</td>
<td>High Prevalence of Cisplatin-Induced Ototoxicity in Paediatrics in Johannesburg, South Africa</td>
<td>Dr Mukovhe C. Phanguphangu, Frere Provincial Hospital &amp; University of Cape Town, South Africa</td>
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<td>15:30-15:50</td>
<td>Measuring evoked responses to speech</td>
<td>Dr Steven Bell, University of Southampton</td>
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<td>15:50-15:55</td>
<td>New BSA APD Position Statement &amp; Guidance Document</td>
<td>Dr Nicole Campbell, USAIS, Faculty Engineering and the Environment, University of Southampton</td>
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<td>15:55-16:00</td>
<td>APD in Children</td>
<td>Dr Tony Sirimanna, Great Ormond Street Hospital, London</td>
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<td>16:20-16:45</td>
<td>APD in Adults (including assistive listening devices)</td>
<td>Dr Doris-Eva Bamiou, UCL Ear Institute &amp; UCLH Audiological Medicine Department, London</td>
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<td>16:45-17:00</td>
<td>Questions and discussion</td>
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Carriage Suite

17:05  Closing Remarks: Dr Edward Killan, BSA Vice-Chair
Dr Sally Austen, Consultant Clinical Psychologist, Austen Psychology, Stourbridge

Dr Sally Austen is a Consultant Clinical Psychologist with 25 years of experience of working with deaf people who have mental health problems and/or learning disabilities. Her private work for Austen Psychology includes Expert Witness instruction and Mental Capacity assessment; she provides training for hearing clinicians in mental health and deafness - as well as providing mental health training to BSL interpreters. She provides supervision to both clinicians and interpreters.

Dr Austen is the co-editor/author of ‘Deafness in Mind. Working Psychologically with Deaf People across the Lifespan’ by Austen and Crocker and ‘Deafness and Challenging Behaviour. The 360 Perspective’ by Austen and Jeffery. Her work in Non-organic Hearing Loss and the evolution of the Austen-Lynch Model (2004) has received significant approval for increasing understanding of psychological processes and motivation in clients with NOHL.

In her NHS work Dr Austen works in the National Deaf Mental Health Service, Birmingham which provides a multi-disciplinary inpatient and outpatient service to Deaf adults who have severe mental health problems. She is Chair of the national special interest group for Applied Psychologists in Deafness.

Presentation details:
Thursday 29th June 2017

Challenging Behaviour, Hearing Loss and the Justice System

How can deaf people be both over-represented in prison and significantly ‘let off’ by the criminal justice system? There is an increased prevalence of challenging behaviour in sign language users and the prevalence of mild hearing loss in prisoners is immense. In one group deafness is connected causally and in the other it is more symptomatic – or possibly syndemic. The issue of cause is complexity to the question of fault. If a person never had the opportunities for ‘right’ behaviour, can they be held accountable for ‘wrong’ behaviour? And if people are not provided with an equal service as they move through the Criminal Justice System, can they be charged? Provision of specialist assessment and treatment is for people whose challenging behaviour is associated with mental health problems or learning disability is essential. But what about people whose behaviour would
be classified as ‘only’ criminal, rather than forensic – is rehabilitation really available? And, in relation to challenging behaviour, what facilities are there for preventative work with people in either category: the forensic or criminal; the Deaf or the deaf?

Attitudes of professionals and non-professionals, as well as the design of the services, when dealing with deaf people and hard of hearing people range from the inanely sympathetic to the downright abusive – with Kafkaesque logic thrown in for good measure!

When should a policeman book a British Sign Language interpreter and when should he just shout very loud?

Dr Doris-Eva Bamiou, Reader & Consultant in Audiovestibular Medicine, UCL Ear Institute & UCLH Audiological Medicine Department, London

Dr Doris-Eva Bamiou MD MSc PhD FRCP is Reader at the UCL Ear Institute, and Consultant in Audiological Medicine at UCLH and Great Ormond Street. Her PhD is on auditory processing in patients with structural brain lesions. She received the Pat Jobson Prize of the British Association of Audiological Physicians for promoting the field of auditory processing disorders - APD in the UK (2002) and the Pat Jobson prize of the Royal Society of Medicine (2012). She has been Director and Organiser of the APD advanced masterclass (UCL) for several years and is Programme Director of the MSc in Audiovestibular Medicine (UCL). She has served as Secretary-elect of the British Society of Audiology, International Association of Physicians in Audiology and Chair of the APD Specialist Interest Group (BSA). Her research interests include clinical presentation of APD in normal subjects and after stroke, auditory rehabilitation after stroke and balance rehabilitation.

Presentation details:
Friday 30th June 2017

APD in Adults (including assistive listening devices)

Approx. 4% of working age (20-60 years) adults (Hind et al, 2011) and up to 10% of all adults (Kumar et al., 2007) who present to Audiology departments with complaints of significant listening difficulties have normal pure tone thresholds. A proportion of those will have an Auditory Processing Disorder. Adults with APD may have this diagnosis since childhood or may acquire this disorder due to a neurological condition or age related changes later in life. A main symptom they complain of is their inability to ignore other sounds
when listening to something. Adult patients with stroke may experience difficulties with sound localisation, sound recognition or speech in noise recognition after their stroke. However, in both neurological patients and in otherwise normal adults, listening concerns may be dismissed in the presence of a normal audiogram with limited if any advice. This lecture will discuss APD in adults from both a diagnostic and a management perspective.

Dr Steven Bell, Associate Professor in Audiology, University of Southampton

Dr Steven Bell is Associate Professor in Audiology within Engineering and the Environment at the University of Southampton. Steve is a registered Clinical Scientist and coordinates the MSc in Audiology at the University of Southampton. His main area of research involves measuring the brain response to sound. This is important for testing hearing, particularly in newborn infants, but has other applications including measuring if hearing aids are working well and telling if people wake up in operations. He is also interested in methods to test human balance and ways to evaluate the benefits of hearing aids and cochlear implants.

He is principle investigator on the project ‘Personalized fitting and evaluation of hearing aids with EEG responses’ funded by the Engineering and Physical Sciences Research Council (EPSRC, grant No. EP/M026728/1). This is a joint project between the universities of Southampton, Imperial College and Manchester, and the Interacoustics Research Unit.

Presentation details:
Friday 30th June 2017

Measuring evoked responses to speech

Our auditory brain is very good at detecting speech, which we are able to understand when listening in considerable background noise. However measuring the evoked response of the brain to speech using surface electrodes is challenging. A number of groups worldwide are carrying out research in this area, but the limitations and clinical applications of such methods are not yet fully understood. Artificial stimuli such as clicks and tone pips evoke robust responses such as the Auditory Brainstem Response that, whilst only fractions of a μV in amplitude, can be recorded reliably with appropriate averaging and filtering. Evoked responses to such
stimuli are widely used in neonatal hearing assessment and have had great clinical impact as they allow hearing aids to be fitted to infants from a few weeks of age, minimising effects of auditory deprivation. When we fit hearing aids to infants the signal that we are generally most interested in making audible is speech. However measuring the response to clicks and tone pips does not allow us to directly demonstrate that the brain is responding to speech. Also the response of hearing aids to speech on a typical user setting may be different from that produced using artificial stimuli such as clicks or tone pips, so using artificial non-speech sounds may have limitations for evaluating hearing aid benefit. By measuring evoked responses to speech we may be able to demonstrate that hearing aids give access to speech and/or adjust hearing aids to maximise benefit for the user, but key questions for clinical use are the reliability and duration of measurements. Various approaches have been used in the literature to explore the measurement of evoked responses to speech, using stimuli ranging from simple repeating speech tokens such as ‘da’ through words and sentences to running speech. Also evoked responses to speech have been measured from the brainstem level through to the cortex. In this talk I will summarise key approaches that have been used to measuring evoked responses to speech and discuss their potential application to evaluate or adjust hearing aids. I will also give an update on findings from the EPSRC funded project EP/M026728/1 ‘Personalized fitting and evaluation of hearing aids with EEG responses’. In this project we are exploring the limits of measuring evoked responses to speech with a view to using the most promising methods to evaluate or adjust hearing aids for the end user.

Dr Sarah Bent, Principal Clinical Scientist (Audiology), North Wales Audiology Service, Betsi Cadwaladr University Health Board

Sarah Bent is a registered Clinical Scientist with the Audiology Department of Betsi Cadwaladr University Health Board in North Wales. She originally studied at the University of Manchester, completing a PhD in Physics before starting her career in Audiology. Sarah’s professional interests include clinical research in Audiology adult rehabilitation, and assessment and rehabilitation for adults with dementia or learning disabilities. She is the clinical representative for dementia on the British Society of Audiology Cognition in Hearing
Special Interest Group, which has included Chairing the working group for the BSA recommendations for assessment and rehabilitation of people living with dementia, as described in the presentation today.

**BSA Guidelines: Audiology for Adults living with Dementia**

Within the audiology profession, there is good awareness of hearing impairment being linked to increased risk of dementia. It is suggested, however, that hearing impairment may be under-diagnosed and under-treated in people living with dementia. This unmet need raises concerns around efficient detection and effective management of hearing impairment in current clinical practice.

There is currently no specific guidance on audiological interventions for people living with dementia. Discussion papers include approaches that may be taken, but an international survey reported that audiology professionals believed that they did not have sufficient information or training.

**Professor Stefan Bleeck, Professor of Hearing Science and Technology, University of Southampton**

I am Professor for Hearing Science and Technology in the Hearing and Balance Centre in the Institute of Sound and Vibration Research (Faculty of Engineering and the Environment) since 2005. I have been the Acting Head of the Hearing and Balance Group with 13 staff (academic and clinical) and around 120 students in 2012-2014. I am recognised as a leading interdisciplinary researcher in the fields of auditory physiology, audiology and signal processing. This is evidenced by my track record of publications and the ability to obtain interdisciplinary funding. The aim of my research is to understand how we hear sound and to use this knowledge to create bio-inspired solutions to enhance speech communication for the hearing impaired. I have currently two large (>£0.5M) grants to improve hearing aids (EPSRC EP/K020501/1: Designing better hearing aids using physiologically inspired speech enhancement and EU ITN “ICanHear”) and was awarded a Google Research award in 2011. I have so far successfully supervised 8 PhD students and 122 undergrad and postgrad research projects in Audiology, Acoustical Engineering, Sound and Vibration Studies, Advanced Mechanical Engineering and other programs. In 2009 I was awarded the vice chancellor’s teaching award for recognition of my contribution to the Audiology teaching programme.
Design of a Cheap Easily Usable Experimental Hearing Aid

Many researchers in the field of audiology and signal processing have ideas on how to improve the quality and usefulness of hearing aids. However, developing algorithms is easy – testing them in the real-world is incredibly difficult, because this requires a lot of groundwork to be done, from programming the algorithm in real-time to deploying them on a stand-alone platform that users can take home with them and test for a prolonged time. Therefore, today’s signal processing algorithms for hearing aids are usually developed only in large companies. Arguably, research and development – and therefore improvements of the quality of hearing devices - would be much more productive if there are ways of doing the whole product development in the lab, from programming to deploying.

In my presentation, I will discuss the current state of the work in this field, present several novel approaches and finally present a low-cost, real-time, fully functional hearing aid based on the Raspberry Pi computer.

Julie Brady, Advanced Audiologist, Nottingham University Hospitals NHS Trust

Julie Brady has worked in the NHS since 1982 and has been based in the East Midlands throughout her career. Having been heavily involved in the BSc programme previously her focus is now clinical. She is currently working in Audiology at Nottingham University Hospitals where her interest in tinnitus has grown to include participation in research projects alongside supporting her clinical workload. She remains focussed on delivering quality tailored support to all patients.

Workshop on Recommended Procedure for Fitting Combination Hearing Aids for Tinnitus (alongside Dr Magdalena Sereda)

Combined amplification and sound generation devices for tinnitus: towards creating clinical guidance and recommended procedure

Combination devices provide both amplification and sound generation, and new generation devices now offer the same amplification features as their 'standard' hearing aid counterparts. According to a recent British Tinnitus Association tinnitus service evaluation 74% of UK audiology clinics can offer combination hearing aids, however the number of people with tinnitus fitted with combination aids varies greatly between different clinics. Fitting protocols are far from standardised with different clinics.
offering different options (one vs several programmes, enabling volume control or not, type of sound). One of the reasons for those differences is the lack of current UK tinnitus management guidelines and lack of any clear recommendations about candidature and prescription options for combination hearing aids. In 2016 the British Society of Audiology Tinnitus and Hyperacusis Special Interest Group initiated development of evidence-based tinnitus management guidance for audiologists, and a recommended procedure for fitting combination hearing aids. The first step was a UK wide survey that gathered the opinions of hearing professionals regarding candidacy and fitting practices for combined amplification and sound generation for tinnitus. The survey highlighted the areas of considerable variability in practice including: i) criteria for candidacy, ii) setting the level of sound, iii) type of sound/s used, iv) adjustments applied to the sound, v) laterality of fitting, vi) number and types of programmes used, vii) recommendations on time per day the devices should be used. The next step will involve a Delphi survey (series of questionnaires with feedback) among UK hearing professionals experienced in prescribing and fitting combination hearing aids. We will identify those topics where there is consensus and those where consensus was not reached. The areas where agreement is reached will inform recommended procedures for candidacy and fitting of combination aids for tinnitus and hearing loss. The areas where there is no consensus will directly inform new research questions. During the workshop we will invite hearing professionals to discuss those topics around candidacy and fitting of combination hearing aids where clinical practice is variable. We will explore the reasons and motivations for different approaches and information gathered will directly inform the Delphi survey and ultimately aid development of guidelines and recommended procedure.

Dr Siobhán Brennan, Audiology Lecturer, University of Manchester

Dr. Siobhán Brennan is an Audiology Lecturer at Manchester Centre for Audiology and Deafness, University of Manchester and a Lead Clinical Scientist at the Regional Department of Neurotology, Sheffield Teaching Hospitals. Siobhán’s specialisms are auditory electrophysiology and Audiological care for adults with intellectual disabilities. In addition to clinical, research and educational roles, she has chaired groups focused on improving practice including HaLD and the BSA EP SIG.

BSA Guidelines: Audiology for Adults with Intellectual Disabilities
What is the evidence that we can use to guide our practice to audiological care and management for individuals with intellectual disabilities? How coherent is this evidence and how can it be applied to clinical practice?

Helen Brough, Volunteer Clinical Scientist (Audiology), African Bible Colleges Hearing Clinic and Training Centre, Malawi, Africa

Helen trained as a clinical scientist in Audiology at Addenbrooke’s Hospital in Cambridge. In 2014 she volunteered at the African Bible College Hearing Clinic and Training Centre (ABC HCTC) in Malawi for 3 months. In 2015 she returned for another 3 months to teach a course on Vestibular Assessment and Rehabilitation and to set up a vestibular service. She is currently again volunteering at ABC, this time as a lecturer and clinical lead, with special responsibility for setting up a Newborn Hearing Screening Programme.

Many audiologists would like to volunteer their expertise overseas in a way that makes a lasting difference. The work of the ABC hearing clinic in Malawi demonstrates how high-quality, sustainable services can be developed through the collaboration of international audiologists and national staff. There is little emphasis on vestibular service development in humanitarian audiology, yet a clear need was identified in Malawi as soon as the service was offered. A basic vestibular assessment can be carried out with minimal equipment, although good training, Frenzels, a method of filming results, and remote access to specialists were found to be vital. The first newborn hearing screening programme in Malawi was set up at ABC last year; data from 3 different populations (private clinic, community clinic and premature baby unit) indicate a high ‘lost to follow up’ rate due to poverty, poor health education and a culture where healthcare providers are not expected to be pro-active. Many people in Malawi have multiple disabilities, often due to preventable diseases. A good way for staff to learn the specialist audiological skills required to best serve this population is to provide intensive training through arranging dedicated clinics for complex patients. There is a huge unmet need for audiology services in the developing world. Service developments within an established centre of excellence is relatively straightforward and well-received. There is a place for short-term volunteers to offer training courses, however longer-term volunteers are required to promote sustainability. Overseas
experts willing to offer remote support via email are vital for services developing in places without a local peer support network.

**Professor Iain Bruce, Consultant Paediatric Otolaryngologist at the Royal Manchester Children’s Hospital**

Iain has worked as a Consultant Paediatric Otolaryngologist at the Royal Manchester Children’s Hospital since 2009 and is the Honorary Professor of Paediatric Otolaryngology, MAHSC, University of Manchester. He is a member of the Standing Scientific Committee of the European Society of Paediatric Otolaryngology and the council of the British Association of Paediatric Otolaryngology (BAPO). Iain is an active researcher, holding 5 NIHR grants and regularly contributes by invitation to Paediatric ENT, CI and BCI conferences and meetings.

He is the deputy editor for *Cochlear Implants International* and member of the International Editorial Board for *Clinical Otolaryngology*.

**Presentation details:**

Thursday 29th June 2017

**Challenges facing CI: Candidacy, Longevity and Evidence for Efficacy**

**Prof IA Bruce**  
**Manchester, UK**

Cochlear Implantation (CI) is now established as having a central role in the management of profound hearing loss, supporting socialisation and the achievement of educational and employment potential. Advances in technology have driven evolution in the application of cochlear implantation to different clinical scenarios and patient groups. However, such advances demand strong evidence of efficacy and value to healthcare systems.

Themes illustrating the increasing need for evidence of best practice include: 1. candidacy criteria, 2. maintenance of benefit and performance, and 3. heterogeneity of outcome reporting.

**Candidacy criteria**

Ultimately, the goal should be that the maximum number of patients benefit from CI. Currently, candidacy criteria vary between countries and in their application by individual centres.

**Maintenance of benefit and performance**
The long-term durability and performance of CIs will become apparent over time, with all companies prospectively collecting data. An insight into the long-term effects of cochlear implantation upon the inner ear, can be provided by Hearing Preservation surgery.

Outcome reporting
Much of the evidence of efficacy for CIs has been taken from case series from large centres, with a paucity of randomised studies for valid reasons. Current levels of heterogeneity in outcome reporting negatively impact upon the meaningful combination and comparison of data. These themes will be discussed in greater detail, along with the problems faced in generating evidence supporting best practice.

Professor Peter Callery, Professor of Children's Nursing, University of Manchester

Peter Callery is Professor of Children’s Nursing at the University of Manchester. He has over 20 years’ experience researching children’s health care, with particular focus on self care and long term conditions. Recent projects have included studies of conditions affecting hearing, including Otitis Media with Effusion associated with Cleft Palate.

Integrated care and patient centred practice

The “House of Care” is a model for integrating services for people with long term conditions included in the NHS England 2015 Action Plan on Hearing Loss. The “house” has “walls” (an engaged and informed patient; professional partners) under a roof (organisational systems and processes) resting on foundations (commissioning plans). This presentation examines the perspectives of parents and practitioners and their implications for the development of a “House of Care” for children with hearing problems due to Otitis Media with Effusion. The presentation will draw on studies of the views of parents of 37 children with cleft palates and a national sample of professionals caring for children with Down’s Syndrome. Parents identify how they can take on the role of coordinator to integrate primary and secondary, social care and education and across developmental transitions. They describe the process of learning about hearing problems within the context of long term
conditions and some identify gaps in understanding that are a barrier to engagement. Professionals identify how variations in decision making arise from their views of their remit, understanding of the impact of hearing loss, and the burden of treatments. Implications for the development of integrated services are considered.

Elena Calzolari, Postdoctoral Research Associate, Department of Medicine, Imperial College London

Since January 2017, I am working as a Postdoctoral Research Associate in the Neuro-otology Unit, Department of Medicine, at Imperial College London, on brain mechanisms of imbalance after traumatic brain injuries, under the supervision of Dr Barry Seemungal. From 2012 to 2015 I was a PhD student at the University of Milano-Bicocca (Italy), supervised by Prof Giuseppe Vallar and Dr Alberto Gallace. Here my research focused mainly on body and spatial representation in healthy population, and neuropsychology and rehabilitation in brain damaged patients. During my last year of PhD I have been visiting the Body Representation Laboratory, Department of Psychological Sciences at Birkbeck, University of London, supervised by Prof Matthew Longo, where my research have focused on the sense of touch, specifically on the perception of tactile distances. I am also a psychologist and I have been trained in neuropsychological assessment and rehabilitation of patients with acquired brain damage.

Presentation details:
Thursday 29th June 2017

Coupling and uncoupling of vestibular perceptuo-reflex in healthy participants and patients with head trauma.

Abstract: Is well known that vestibular stimulation can elicit both low-order vestibular-ocular reflexes (VOR) and higher-order self-motion perception (e.g., vertigo) responses. Typically, in healthy participants, these two responses are coupled, namely: their duration is normally equal and correlated. Nonetheless, some particular, yet non-pathological, circumstances, require these two responses to be uncoupled, for adaptive purposes. Indeed, vestibular perceptuo-reflex uncoupling becomes adaptive in ballet dancers, enabling them to suppress dizziness following a pirouette. Data from a published study report behavioural and neuroimaging evidence of uncoupling of low-level VOR and higher-order perceptual responses ballet dancers, who are trained and adapted to repeated whole-body rotations. In particular, as compared to the control group, dancers showed briefer and uncoupled VOR and perceptual responses, and a
selective grey matter reduction in vestibular cerebellum (which correlates with ballet experience). As opposed to controls, who showed an opposite pattern, dancers’ vestibular cerebellar gray matter density reduction was related to shorter perceptual responses but longer VOR duration. Moreover, controls’ strong vestibular perception correlated with a cortical white matter network that was notably absent in dancers. Finally, some pilot data on pathological vestibular perceptuo-reflex coupling-uncoupling in patients with traumatic brain injury are also presented.

Dr Nicole (Nicci) Campbell, Associate Professor/Principal Audiological Scientist, University of Southampton

Nicci Campbell (BLog, MLog, PhD Communication Pathology) is an Associate Professor/Principal Audiological Scientist at the University of Southampton. She is the team lead for both the Auditory Processing Disorder (APD) and Self-funded Cochlear Implant Services. She is dually qualified as an Audiologist and Speech-Language Therapist. Her research interests include cochlear implants and ‘hearing beyond the audiogram’. Over the past 20 years she has worked as both a clinician and academic; teaching and supervising the research of under- and postgraduate students, presented at conferences, authored peer-reviewed publications, including several national APD position statements and practice guidance documents. She was the chair of the BSA’s APD Special Interest Steering Committee (2011-2014) and has recently been re-elected (commencing June 2017). She has served as a BSA Trustee (2014-2017). She was awarded the Ruth Spencer Prize by the BSA in 2016 for her contribution to the field of APD.

Presentation details: Friday 30th June

New BSA APD Position Statement & Guidance Document

APD was first described more than 60 years ago as ‘the inability to structure the auditory world’ (Mykelbust, 1954:158). It has had a controversial history regarding definition, diagnosis and management. To address the principal controversies of APD, the BSA (2011a, 2011b) published a ‘Position Statement’ and ‘Practice Guidance’. These documents have served as a general catalyst for a fundamental reconsideration of APD by highlighting the importance of evidence-led discussion and practice, and promoting the need for collaboration between clinicians and researchers, across disciplines and countries. The 2011 BSA Position and Practice documents led to a ‘white paper’ on Developmental APD that outlined current thinking in the UK and included commentaries from other research groups working on APD.
international (Moore et al, 2013). The BSA APD Special Interest Group (SIG) collaborated with the American Academy of Audiology (AAA) to present an APD International Conference as part of the AAA Annual Conferences in 2012, 2014 and 2016. Several other groups around the world have now also issued APD statements, guidelines and/or white papers.

As a result of these publications some shared themes are emerging:

- Agreement regarding limitations of the pure-tone audiogram in providing information about speech perception in both quiet and noise and day-to-day demands on hearing and listening
- Need to reduce number of tests while increasing quality - appropriate norms, reliability, validity
- Concern that listening problems are neither identified nor treated before the age of 7. Early fitting of devices for hearing loss clearly demonstrates that early identification and management provide best results
- Importance of relating skill testing to everyday hearing and listening, and to effective rehabilitation
- Importance of cognitive functions, and their impairments, for APD and all other aspects of hearing
- Value of individualised care, especially given the heterogeneous nature of APD

The purpose of our new document (due for imminent release) is to:

1. Generate further international dialogue and research.
2. Provide information to enable clinicians to make informed choices, based on current evidence. This document complements rather than replaces our existing documents, and will be updated as new evidence and consensus emerges.
3. Educate and consult with professionals and funders at a local and national level about APD, its nature, assessment and management, and simultaneously to develop national policy with respect to APD. APD is an area that straddles both health and education and consultation with the key stakeholders in both domains is essential. Additional stakeholders include caregivers and other members of the public, and professionals and researchers working in related fields of language, learning and cognitive function, paediatricians and GPs.

References:

Cherith Campbell-Bell, PhD
Professional and Consumer Engagement Specialist at Cochlear Europe Ltd.

Cherith completed her BSc in Audiology at the Institute of Sound and Vibration Research based at the University of Southampton. She then went on to study for her PhD, investigating the enhancement of fast spectral changes in speech (or acoustic landmarks) as a method for improving speech perception in noise for cochlear implant recipients. Following her studies, Cherith went on to work as a clinician within an NHS audiology department. More recently she was a post-doctoral researcher at Southampton General Hospital, where she worked on a project aiming to measure intracranial pressure, non-invasively, through the ear. Cherith moved to Cochlear in January 2017 and is now providing professional awareness training on cochlear implants, as well as supporting potential implant candidates in their journey towards getting an implant.

Making Implantable Hearing Solutions the Standard of Care

Forty years since the first hearing implant offered individuals an alternative to conventional hearing aids, patients now benefit from a range of implantable hearing solutions, including bone conduction hearing implants, cochlear implants, and middle ear implants. Despite advances in technology and a greater understanding of who can benefit...
from these devices, less than 5% of adults suitable for an implant actually receive one. With the help of Universal Neonatal Hearing Screening, uptake in the paediatric population is much higher.

In May this year, the World Health Assembly (WHA) supported a resolution that provides a hearing health action plan and recognises the benefits of prevention, intervention and treatment of hearing loss globally. This includes improving “access to affordable, cost-effective, high-quality, assistive hearing technologies and products, including hearings aids, cochlear implants and other assistive devices” (WHA, 2017). With a potential 37,000,000 hearing implant candidates globally, this session will explore the reasons why uptake of these solutions is so low amongst the adult population, how we can increase awareness of implants as a solution to hearing loss, and how industry can help ease the pressure on already stretched NHS services if referrals increase.

Dr David Charnock PhD, MSc, Dip. Ad. Ed., RN (Learning Disabilities) Assistant Professor in Intellectual Disabilities, School of Health Sciences, University of Nottingham.

Dr David Charnock is an Assistant Professor in Intellectual Disabilities at the University of Nottingham. He is currently Cohort Lead for the BSc (Hons) in Nursing. Prior to becoming an educator, he had a broad experience of working within clinical practice within the NHS to senior management level. David completed his PhD in 2013 and his research to date has focused on using qualitative methods to explore issues related to identity for people with intellectual disabilities and in particular issues of masculinity. David has presented at numerous national and international conferences, has developed a network focussing on the transition experiences for young people with intellectual disabilities. Other research interests include the postpartum experience of women of children with Down’s syndrome and access to health care for people with cognitive impairment. He is also co-applicant on a European collaboration exploring technology for people with special educational needs.

Presentation details: Thursday 29th June 2017

Multidimensional and Patient Centred Approaches to Mental Health and Cognitive Impairment (speaking with Dr Nicola Wright)
Healthcare services and practitioners are dealing with increasing levels of complexity as individuals have longer life expectancy (the Marmot Review in 2010 identified that of people over the age of 68, 75% will have at least one long term condition), technological advancements become more available (including devices and drug treatments) and new models of working adopted. These developments mean that NHS resources need to go further and decisions regarding the rationing of treatments (who gets what and when) become increasingly difficult and political. This can be particularly challenging for people with hearing loss, mental health problems and cognitive impairment where the nature of their difficulties can be invisible (in comparison to other physical ailments), intractable and difficult to find solutions to. Within this context, practitioners become confused by logical aspects of the person’s presentation which coexist with behaviours and symptomatology which appear illogical and disordered. As a result clinicians with the subject expertise and the pressures of working within health services can often simplify the situation so that we meet the outcomes required; but as professionals this can lead to feelings of frustrated and a perception that patient needs have not been fully met. Using practice based examples we explain how complexity theory can help us to see how order and disorder can exist alongside each other. This new perspective assists us to simplify difficult episodes of care by remaining with and simultaneously appreciating the complex nature of systems and the individuals who inhabit them.

Helen Chilton, Lecturer in Deaf Education, Manchester Centre for Audiology and Deafness, University of Manchester

Helen Chilton is a Lecturer in Deaf Education for the University of Manchester. Helen has a background as a Teacher of the Deaf and works on the Teacher of the Deaf training programme. Since working at University of Manchester, Helen has published in the field of social cognition and deafness and has led a number of research projects investigating practical intervention to improve Theory of Mind (understanding the thoughts and feelings of ourselves and others) and has presented on this topic extensively, nationally and internationally. Helen took a key role in the development of a MOOC (Massive Open Online Course) focused on deafness in low and middle income countries and the MOOC enabled free global training and raised awareness. Recently, Helen has worked on a project enabling remote supervision of Teachers of the Deaf involving the introduction of new technologies (Swivl) and was co-winner with Prof. Wendy McCracken
of a social responsibility award for enabling deaf primary school children to experience university life.

Global Outreach SIG: Deafness in the 21st century: low and Middle-income countries – creating a MOOC to raise awareness

85 % of deaf individuals live in low and middle-income countries where resources are scare. With estimates that 50% of deafness in Sub Saharan Africa is preventable (WHO), lack of specialists, different understandings of deafness and poverty mean many deaf individuals are isolated and excluded. The MOOC (Massive Open Online Course) is free and open to anyone with wifi. We brought together a range of NGOs, specialists and parents of deaf children and Deaf adults, with stories from Africa, India, South America, Cambodia and Papua New Guinea that illustrate positive stories, to provide information about deafness that was evidence based. It was also vital and to challenge all those working in this area to have a positive, practical and informed approach to deafness. This presentation will look at the challenges, positive practice and feedback from MOOC participants. This MOOC will re-launch and be available on a continuous loop free to all. For anyone considering working in or donating equipment to a low/middle income country, it is essential viewing.

Dr Helen Cullington, Clinician and Researcher, University of Southampton

Helen Cullington is a clinician and researcher working at the University of Southampton Auditory Implant Service. She has more than 23 years’ experience in cochlear implants, having worked on several implant programmes within the United Kingdom and the United States, including House Ear Institute in Los Angeles.

Helen’s first degree was in Physics followed by an MSc in Audiology at the University of Southampton in 1993. Helen was captivated by cochlear implants – the use of technology to improve people’s lives. She began working in cochlear implants immediately, spending several years in UK and US centres. Helen completed her PhD at University of California, Irvine in 2008. She now works at the University of Southampton Auditory Implant Service, splitting her time between seeing patients and research.
Helen is committed to developing tools to allow people with cochlear implants to manage their own care at home.

Presentation details:
Thursday 29th June 2017

Cochlear Implant Care: Putting Patients in Charge

Aim:
To design, implement and evaluate a person-centred long-term follow-up pathway for adults with cochlear implants offering:
• home hearing test on iPad or computer (Digit Triplet Test)
• online support tool for troubleshooting, rehab, info etc.
• upgraded processor sent to home instead of clinic visit (if upgrade due)
• self-mapping for some people

Method: This was a two-arm feasibility Randomised Controlled Trial involving 60 adults using cochlear implants with at least 6 months device experience in a 6 month clinical trial of remote care. The control group followed their usual care pathway. The remote care group were given tools to care for their implant and hearing at home. The main outcome evaluated was patient empowerment. Secondary outcomes were hearing, quality of life, and subjective feedback from patients and clinicians. Results: The remote care group had a significant increase in their cochlear implant empowerment after using the remote care tools. Quality of life remained unchanged in the two groups. The hearing test result had improved in the remote care group, although they had not noticed a change. The control group, however, felt their hearing had become slightly worse. Subjective feedback was positive with most patients finding the home hearing test the most valuable tool. Conclusion: and plans for spread offering remote follow-up may result in more empowered patients; more stable hearing; reduced patient travel expense, time and disruption; greater equality in service delivery and more freedom to optimise the allocation of clinic resources. At the University of Southampton Auditory Implant Service, some aspects of remote care are now offered to adults as part of personalised stratified care, with a full roll out planned by the end of 2017.
Dr Piers Dawes, Senior Lecturer, University of Manchester

Piers Dawes is an experimental psychologist and senior lecturer in Audiology at the Manchester Centre for Audiology and Deafness (ManCAD) at the University of Manchester. Dr Dawes's research interests include epidemiology of hearing loss, auditory processing and developmental psychology from childhood to old age, auditory plasticity, hearing genetics and developmental disorders. Dr Dawes currently leads the SENSE-cog study, a multi-national study of hearing and vision impairment and dementia funded by the European Commission's Horizon 2020 program.

Current Evidence Base and the SENSE-Cog Research Programme

Background: Age-related hearing problems are common among people with dementia and are associated with poorer function, reduced quality of life and increased caregiver burden. Addressing hearing impairments may offer an opportunity to improve various aspects of life for people with dementia. We identified and described studies that reported on interventions for hearing impairment in people with dementia in relation to cognitive function, rate of decline, psychiatric symptoms, hearing/vision-related disability, quality of life and/or caregiver burden. Method: Electronic databases were searched using key terms dementia, hearing impairment, vision impairment, intervention and management. Database searches were supplemented by hand searching bibliographies of papers and via consultation with a network of health professional experts to identify additional literature. Results: Eight studies describing hearing intervention were included. One randomised controlled trial was identified. Hearing interventions included provision of hearing aids, hearing aid trouble shooting or cochlear implantation. There was no consistent evidence for the impact of hearing/vision interventions on cognitive function, rate of decline, quality of life or caregiver burden. There was some low level evidence for hearing interventions in relation to reductions in behavioural and psychological symptoms of dementia and hearing disability. Conclusions: Hearing interventions are feasible for people with dementia, and treating hearing impairment may result in reduction of behavioural and psychological symptoms of dementia as well as hearing disability. Commission's Horizon 2020 program
Dr Ennur Erbasi, Research Fellow, School of Health Sciences at The University of Melbourne

Dr Ennur Erbasi is a Research Fellow within the School of Health Sciences at The University of Melbourne. She is a member of the Communication Disability Centre and The HEARing Cooperative Research Centre. Ennur’s research interests include: early intervention outcomes for children with hearing loss; parental involvement in intervention; family- and person-centred care in hearing (re)habilitation; and the translation of research into clinical practice. Currently, Ennur is working within a multi-disciplinary team who are exploring the implementation of person-centred care in audiological rehabilitation across Australia. Ennur has presented her research at both national and international conferences, and has published work in peer-reviewed journals.

Presentation details:
Thursday 29th June 2017

Parental involvement: Implications of Family-Centred Care in Audiological Settings

Ennur Erbasi, Nerina Scarinci, Louise Hickson, and Teresa Y.C. Ching

A qualitative descriptive study was undertaken to explore: (a) the nature of parental involvement in the intervention of children with hearing loss; and (b) factors that influence parental involvement. Interviews were conducted with 12 professionals (early interventionists and teachers) and 17 parents of children with hearing loss aged 6 to 9 years at the time of the study. The overarching theme of parents taking the central role was identified using thematic analysis. This overarching theme connected five themes which described the nature of parental involvement: (1) parents work behind the scenes; (2) parents act as ‘case managers’; (3) parents always have their child’s language development in mind; (4) parents’ role extends to advocacy for all children with hearing loss; and (5) parents serve a number of roles, but at the end of the day, they are parents. Furthermore, the results indicated that parental involvement may be influenced by a range of factors that interact with one another. Conversations with participants drew attention to the dynamic nature of families and the importance of social support to parental involvement. These findings have important implications for the provision of family-centred practices.
Dr Melanie Ferguson, Consultant Clinical Scientist (audiology) and Hon. Associate Professor, Research Lead, NIHR Nottingham Biomedical Research Centre

Mel Ferguson, PhD
Dr Melanie Ferguson is a Consultant Clinical Scientist (audiology) and Hon. Associate Professor at the NIHR Nottingham Biomedical Research Centre, where she leads a research team. Her research programme on Mild to Moderate Hearing Loss aims to promote healthy hearing by reducing activity limitations and participation restrictions. This is based on (i) e-health and self-management, (ii) listening and cognition, and (iii) person-centred approaches. Her research includes systematic reviews, experimental studies and randomised controlled trials, and qualitative research. She is actively involved in professional affairs and is currently the Chair for the BSA Adult Rehabilitation Interest Group, Lead examiner for the BAA Higher Training Scheme (Research Methods), and is a member of the Ida Institute Research Committee and UK Action Plan on Hearing Loss R&I group. She is the NIHR lead advocate for Audiology and is a full member of the NICE Guidelines Committee for Hearing Loss.

Research opportunities for audiologists: removing the mystique and making research work for you
Melanie Ferguson, NIHR Nottingham Biomedical Research Centre, Nottingham
Amanda Hall, University of Aston, Birmingham

Over the last 25 years, evidence-based practice (EBP) has been gaining ground in many healthcare disciplines. EBP requires the integration of individual clinical expertise, patient values and preferences, alongside the best available clinical evidence. In audiology clinics across the UK, it is clear to see where the clinical expertise and patient values and preferences come from, but what about the best available clinical evidence? This can come from research organisations and universities. However, it is increasingly recognised that active involvement by clinicians and patients in shaping the research agenda significantly enhances research questions, design and outcomes. If you are an audiologist, this is where you come in.

But how prevalent is research activity amongst audiologists? In a recent BSA survey of over 300 hearing healthcare professionals, just under half (47.6%) responded that they do not carry research, but would like to. The main barriers to research were ‘not enough time’ (69.2%), and ‘don’t have the necessary skills (21.9%) or necessary support (36.5%)."
In this workshop we want to highlight the many opportunities that are out there for audiologists that aim to overcome these barriers and facilitate clinical research. Research activities can range from helping recruit patients into studies to leading clinical trials, and there are numerous funding schemes. For example, research funders such as the National Institute for Health Research are actively promoting the development and training of clinician researchers through a raft of funding streams, from degree to post-doctoral level. The good news is that salaries and research costs are included, and research training provided by academics is integral to such schemes.

There is no more mystique to research than there is to clinical activities. In this participatory workshop, we want you to think about the burning clinical questions you might have, which by addressing through research could provide patient benefit. We will work through with you how to develop the research question. We will also discuss how you can be involved in delivering hearing and balance research through the NIHR Clinical research Network, including opportunities and training for becoming a Principal Investigator. A Q&A session will give you the opportunity to ask questions about conducting clinical research, which we will endeavour to answer and discuss. The overall aim of this workshop is to involve you in thinking about how research can work for you (and your patients). And the rest, as they say, is up to you.

Dr Lionel Fontan, Engineering and R&D manager, Archean Technologies Montauban, France

Lionel Fontan received a multidisciplinary education combining computer science, natural language processing, linguistics, language pedagogy and language disorders. In 2012, he was awarded a Ph.D. in Language Sciences from the University of Toulouse (France) for his work on the assessment of speech intelligibility and speech comprehension. After two post-doctoral positions as a researcher in the Psycholinguistics Laboratory Octogone-Lordat (Toulouse, France, 2012-2014) and the Toulouse IT Research Laboratory – IRIT (France, 2014-2015), he took up a position as an Engineering and R&D manager in Archean Technologies, a SME located in Montauban (France). His research now focuses on the use of automatic speech-recognition techniques for the assessment of speech-communication performances in second language learners and in people experiencing motor speech disorders and hearing losses.
Towards the use of Automatic Speech Recognition for the fine-tuning of Hearing Aids

The main complaint of people experiencing age-related hearing loss (ARHL) is their difficulty to understand speech, especially in noisy environments. Speech intelligibility tests may therefore be of interest for the audiologists/hearing aid (HA) dispensers, in order to measure the improvement brought by the HA on their patients’/clients’ abilities to process speech. However, speech intelligibility tests can be rather time-consuming: they require the patient/client to repeat several lists of words or sentences, and the intelligibility score corresponds to the percentage of correct answers. This procedure needs to be repeated for each fitting condition, which can result in an increase of fatigue in the older listeners and thus lead to lower identification performance. It is also well known that the familiarity of the listeners with the test items can influence intelligibility scores. In response to the need for reproducible, fast and objective measures of human speech processing performance, several recent studies showed that Automatic Speech Recognition (ASR) could be used to predict human speech intelligibility and comprehension scores for speech signals mimicking the effects of ARHL (Fontan et al., in press; Fontan et al., 2015), as well as for providing information about the listeners’ ability to distinguish between specific phonetic features (Fontan et al., 2016). More specifically, 60 French young normal-hearing participants listened to words and sentences that reproduced the perceptual consequences of ARHL at different levels of severity. Two intelligibility tests and one comprehension test were administered. Several language models were developed and used by the ASR system in order to fit human performance. Strong significant positive correlations were observed between human and ASR scores, with coefficients up to .99. This encouraging result constitutes a first step towards the long-term goal of this research work: to develop a system that will assist audiologists/hearing aid dispensers in the fine-tuning of hearing aids.

References

Dr Rachna Gopal  
Ear, Nose & Throat Surgeon, Mauritius

Presentation Information:  
Audiology in Mauritius  
Information to follow.

Melanie Gregory, CEO - The Ear Foundation, Nottingham  

Melanie Gregory is the CEO of The Ear Foundation. Her background is in speech, language pathology and audiology. She has a special interest in rehabilitative audiology and person-centred care. The Ear Foundation is a charity which works to bridge the gap between clinic-based services, where today's hearing technologies, such as cochlear implants & bone conducting hearing implants are fitted, and home, school and work where they are used in daily life. Our vision is for children with hearing loss, young people and adults have the opportunity to hear, communicate and develop spoken language using the latest technological interventions.

Presentation details:  
Defining the Role and Value of Audiologic Rehabilitation  
Friday 30th June 2017  
The field of hearing care is changing: e-health is emerging, funding and service delivery is challenged. The need to articulate our value as
a profession and how our role makes a difference has never been more important.

Our ability to support people to understand their hearing, accept and use their hearing technology and manage communication effectively in daily life defines our role and value for the future. We’ll explore the environment in which we work, the language used in the clinic, and how professional and patient factors define the clinical appointment and influence person-centred care and effective self-management.

Discover how to communicate your role and value for the future.

Dr Amanda Hall, Lecturer in Audiology, Aston University

Amanda is a lecturer in Audiology at Aston University and a clinical scientist at Bristol Children’s Hearing Centre. Amanda is also the ENT Specialty Lead for the NIHR Clinical Research Network: West of England.

Her research focuses on the causes, impact and management of hearing loss in children, with a special interest in conductive hearing loss. She is currently involved in several research studies: improving management of hearing loss in children with Down syndrome; health service provision and outcomes for children with cleft palate; risk factors and outcomes for children with otitis media with effusion in the Avon Longitudinal Study of Parents and Children; developing shared decision making tools for clinical Audiology.
Jackie Harding, Clinical Scientist, Regional Co-ordinator, Cardiff and Vale University Health Board and Newborn Hearing Screening, Cardiff

Jackie Harding works as a Clinical Scientist in Paediatric Audiology at Cardiff and Vale University Health Board, and for Public Health Wales in the role of Regional Co-ordinator (Mid and West Wales) for Newborn Hearing Screening. Jackie has worked in Audiology since completing her CAC in East Anglia in 1998 and continued to work in Norwich until her move to Cardiff in 2004. Jackie’s clinical workload focuses on pre-school and neonatal hearing assessment and habilitation. She has been instrumental in developing Version 2 of the Quality Standards in Children’s Audiology, which have been used to quality assure Paediatric Audiology services in Wales and Scotland since 2010. Jackie has led on development of the All-Wales peer review process for neonatal hearing assessment. In her spare time, Jackie is surviving a major house renovation, attempting to raise two girls and trying to stay sane doing CrossFit!

Presentation details:
Friday 30th June 2017

Peer Review of Neonatal Hearing Assessments – a Welsh Perspective

A national network for the external peer review of Neonatal Hearing Assessments has been successfully running throughout Wales since 2009. This session gives information about the structure of this well-established peer review model and may give delegates ideas as to how to set one up in their own area. A number of audits have been carried out on the outcomes of the peer review and these are presented and discussed, along with Audiologist feedback. A review of an audit of consistency between peer reviewers is also discussed.
Professor Louise Hickson, Head of School of Health and Rehabilitation Sciences, University of Queensland, Australia

Professor Hickson is recognized internationally as a leader in audiology. Her major research themes are the effects of hearing impairment on the communication abilities and quality of life of adults, and the efficacy of different forms of intervention (e.g., hearing aid fitting, communication education). She has over 230 publications including 4 books and 18 book chapters and is committed to the transfer of knowledge into practice. The Active Communication Education (ACE) program that she developed and evaluated has been used in many countries around the world. She is an elected Fellow and past President of the International Collegium of Rehabilitative Audiology and a fellow and immediate past President of Audiology Australia. She is also Chair of the Ida Institute Advisory Board in Denmark and an Editor of the International Journal of Audiology. In 2013 Prof Hickson received the International Research Award from the American Academy of Audiology.

Language Matters: What You Say and How You Say It

Our research program has been exploring clinical interactions in audiology appointments to investigate the nature of communication between patients, clinicians and family members and whether or not such communication influences the outcomes of the appointments. Sixty-two hearing rehabilitation consultations with older adults were filmed and verbal communication was analysed using the Roter Interaction Analysis System and Conversation Analysis. Results revealed a paucity of person- and family-centred communication behaviours. For example, patients’/companions’ opinions were rarely elicited; in the presence of a companion, audiologists asked significantly fewer lifestyle-related questions; and, minimal audiologist-patient emotional engagement was observed. Patient concerns about hearing aids and the cost of the devices were often left unaddressed. This presentation will highlight examples of more effective patient and family-centred communication.
Dr Derek Hoare, Associate Professor in Hearing Sciences, NIHR Nottingham Biomedical Research Centre, University of Nottingham

Derek trained in nursing at the University of Brighton and then completed a PhD in neuroscience at University of Manchester. He is now Associate Professor in Hearing Sciences at the NIHR Nottingham Biomedical Research Centre, University of Nottingham. There he leads a programme of research on tinnitus and hyperacusis with particular interests in developing assessment tools and low-intensity psychological and self-help interventions. Derek is a steering group member of European TINNET clinical working group, and Chair of the British Society of Audiology Tinnitus and Hyperacusis Special Interest Group.

Presentation details:
Friday 30th June 2017

Towards equity of tinnitus management across the UK National Health Service

In the UK National Health Service tinnitus management has historically been the domain of the hearing therapist or senior audiologist. However, training in hearing therapy is no longer supported and so now more than ever the skills of the audiologist are critical to meeting the needs of this large patient group; so much so that the Department of Health expect them to upskill where needed to meet the psychological needs of tinnitus patients. Despite this challenge there are no UK practice guidelines for the management of tinnitus in adults. Practices vary hugely both within and between tinnitus services; assessment and treatment are typically guided by clinical experience of what is useful or what works, or may follow a trial and error approach. This is contrary to the Department of Health vision for equal access and equitable health outcomes for tinnitus patients. Two new clinical practice guidelines will be announced in this presentation. The first is a European Practice Guideline developed by the European TINNET network clinical working group. The second is a British Society of Audiology guidance document for the management of tinnitus in adults which is currently in development.
Dr Carol Holland, Psychologist, Aston University, Birmingham

Carol Holland is a psychologist with expertise in the cognitive and health psychology of ageing. Her emphasis is on functional aspects of ageing cognition in terms of maintenance of everyday quality of life even in the context of impairments. She currently works at the Aston University in the UK, with previous employments at the University of Manchester, Warwick University and the University of Leeds. She is currently Director of Aston Research Centre for Healthy Ageing (ARCHA) and has worked at Aston University since 2001. She is a co-ordinator within the European Innovation Partnership on Active and Healthy Ageing, working with other experts across Europe on an end target of reducing the gap between healthy lifespan and actual lifespan. Her current research includes a longitudinal study of cognition, wellbeing and care and cost outcomes of moving into supported living environments, with ExtraCare Charitable Trust, and EU funded collaborative work on optimising management and prevention of frailty amongst older adults across Europe. She has made contributions to the study of autobiographical memory in older age, with a specific interest in applied aspects, positive ageing and prevention of decline. She is also well-known for her work in transport psychology, with an emphasis on maintaining safe road use and mobility.

The Relationship Between Sensory Impairment and Cognitive Function in Older Age: Impacts on Engagement and Active Ageing

Ability to perceive information under conditions of distraction, conflicting demands, background noise or with rapidly changing sources of auditory or visual information is a significant challenge as sensory capabilities change with increasing age. However, processing of the information, responding to it and having enough resources to also encode and remember it is not a simple matter of accuracy of perception. This paper will examine some of the evidence for an increasing relationship between sensory and cognitive decline with increasing age and proposed hypotheses to account for that, before presenting evidence for the role of hearing in long term development of cognitive impairment and dementia. Issues of the impact of changes in aspects of executive function, such as changes in ability to inhibit the processing of irrelevant information will be considered, in relation to effects on aspects of social engagement and everyday cognition, for example use of autobiographical memory or processing of speech in noise, necessary for independence and active ageing. Finally, implications
for rehabilitation will be discussed with evidence from rehabilitation and training studies

Kate Johnston, Clinical Scientist, Freeman Hospital
Newcastle upon Tyne NHS Trust

Kate completed her masters in Audiology at the University of Southampton in 2000. She carried out her clinical training at the Freeman Hospital in Newcastle upon Tyne. Following qualification her first job was to set up the newborn hearing screening programme in the North of Tyne region starting with Northumberland and then rolling it out to North Tyneside and Newcastle. She became Team Leader of the North of Tyne newborn hearing screening programme in 2010 when she took on a new post at the Freeman Hospital. She now heads up the Paediatric Audiology section and specialises in assessment, diagnosis and habilitation of babies and children with hearing loss. Kate lives in Northumberland where she enjoys juggling a busy life of being a mum of 3 children as well as being a Beaver Scout Leader. She has a love of swimming, walking and cycling and generally being outdoors.

Presentation details:
Friday 30th June 2017

Targeted testing for congenital cytomegalovirus (cCMV) in babies identified with a sensorineural hearing loss (SNHL) through the newborn hearing screening programme (NHSP)

Johnston, Kate; Lindsey Philip; Wilson, Charlotte; Emonts, Marieke; Pickering, Ailsa;
Newcastle upon Tyne Hospitals NHS Foundation Trust Audiology Department and Paediatric Infectious Diseases Department
Introduction Recent guidance from the National Screening Committee at Public Health England (June 2016) advises against using the newborn hearing screen to identify babies for universal testing for CMV. However, in Newcastle, targeted testing for cCMV has proven successful in babies identified with a SNHL. Evidence supports the use of oral anti-viral medication (Vangancyclovir), started before 4 weeks of life, to minimise further replication of the virus and its impact on hearing. Guidance for babies referred from NHSP recommends that confirmation assessments are carried out after 4 weeks corrected age to allow for maturation of the ABR response. We therefore aim for the initial assessment to be before 3 weeks age, to trigger cCMV testing. Our clinical experience is that suspected SNHL at this point is reliable. Methods: Liaison between Audiology and Paediatric Infectious Diseases has enabled the pathway to be modified so that babies with a SNHL can be tested for cCMV within the required time. Following the initial diagnosis of SNHL parents are offered screening for cCMV. Audiology provides a nappy pad for urine collection, and the baby is referred immediately for cCMV testing. Results: So far 22% of babies with SNHL have tested positive for cCMV, consistent with the literature. Conclusions: Targeted testing for cCMV adds value to NHSP by identifying children who may benefit from antiviral treatment and allows early identification of the cause of hearing loss. It rationalises parental anxiety by only identifying children with symptomatic cCMV. References: (1) Kimberlin DW et al (2003). Effect of ganciclovir therapy in on hearing in symptomatic CMV involving the central nervous system: a randomised trial. National institute of Allergy and Infectious Diseases collaborative antiviral study group; July; 143(1); 16-25 (2) Steven J, Sutton G, Wood S (2013) Guidelines for the early audiological assessment and management of babies referred from the Newborn Hearing Screening Programme . Guidelines for aetiological investigations into permanent childhood hearing impairment (2015) www.baap.org.uk
Laura Kelly, Lecturer in Criminology, University of Central Lancashire

Laura is a lecturer in Criminology at UCLan who specialises in prison studies, focusing specifically on the lives of hard of hearing/d/Deaf people in prison. She works on modules across the undergraduate Criminology courses offered at UCLan, and is module leader for both of the prison modules delivered there. She has completed a BA in Criminal Justice and Criminology, and an MA in Criminal Justice Studies both at the University of Leeds, achieving a distinction for her MA. She has recently been awarded her doctorate for the thesis entitled ‘Silent Punishment: The experiences of d/Deaf prisoners’, from which she has two forthcoming publications. Laura has also facilitated a successful pilot scheme in conjunction with HMP Kirkham, where students from UCLan and prisoners took part in joint learning activities over a period of four sessions.

Presentation details: 
Thursday 29th June 2017

Hearing Loss in Prison: An introduction

In this paper I consider the experiences of hard of hearing/d/Deaf prisoners. Based on interviews with prisoners and staff members, I examine the subtle and not-so subtle discriminations faced by these prisoners across the prison estate in England and Wales. I argue that prisons are managed through sound – that is, sound is the medium through which instructions, information and formal and informal communication overwhelmingly takes place. This implies that, amongst the very many social differentiations of a prison population, d/Deafness occupies a unique place in the pains of imprisonment. I suggest some key issues surrounding the problems of d/Deaf imprisonment, and outline a number of recommendations for change.
Shannon Kruyt

Hear in Africa, Cape Town, Africa

Cape Town-based HearInAfrica was founded by Shannon Kruyt, a South African audiologist and speech therapist. Having worked in a diverse range of private and public healthcare environments across South Africa, Zambia and the United Kingdom, HearInAfrica developed from Shannon’s love for community-based audiology and her desire to address the urgent and growing burden of hearing loss in Africa. The organisation strives to achieve this aim by improving the quality of, access to, and sustainability of, audiology services in Africa. Shannon is a proud member of the Coalition for Global Hearing Health and serves on their Global Standards committee. She is a registered member of the Health Professions Council of South Africa as well as the South African Association of Audiologists. More information about the HearInAfrica’s philosophy and range of face-to-face and remote services can be found at www.hearinafrica.com.

Presentation details:
Friday 30th June

Dr Guy Lightfoot, Director, ERA Training & Consultancy Ltd

Guy Lightfoot worked in adult diagnostic audiology at the Royal Liverpool University Hospital from 1976 until retiring from the NHS in July 2013. He worked as a member of the NHSP Clinical Group, developing and updating national guidance for newborn ABR testing and peer reviewing and mentoring ABR testers. He continues this clinical support and runs the successful series of UK ERA courses via his company ERA Training & Consultancy Ltd. Guy is on the Council of the IERASG. His previous responsibilities include Chief Examiner of the British CAC scheme and the Continuing Professional Development Co-ordinator and Board member for the British Academy of Audiology. He is an active member of the BSA Electrophysiology SIG, contributing to BSA recommended procedures.

Presentation details:
Friday 30th June

The threshold ABR high-pass filter re-visited: an old chestnut served up in a new way
Introduction

NHSP/BSA guidance on ABR testing of newborns (2013) suggests using a high-pass (HP) ABR filter of around 30 Hz, as evidenced by previous studies, yet internationally many clinicians use 100Hz routinely, or when test conditions are poor in the belief that raising the HP filter affords an advantage.

Method

This issue was revisited using babies in a variety of states of relaxation and HP filter settings of 30, 50 and 100 Hz with an artifact rejection level of ±10 µV and noise-weighted (Bayesian) averaging. Unlike previous studies where the time efficiency of the method was not considered, the signal-to-noise ratio (SNR) was measured after a fixed 61-second period regardless of whether some of that time was spent rejecting sweeps: a real-life scenario that will differentially penalise the 30 Hz HP setting for which rejections will be greatest.

Results

Of the three filter settings, 30 Hz proved to be the most efficient on average (gave the best SNR), even when the baby was restless.

Conclusion

It is likely to be counter-productive to increase the HP filter above 30 Hz in threshold ABRT testing in response to baby restlessness and clinicians are continued to be advised to use 30 Hz.

Dr Frank Lin, Associate Professor of Otolaryngology, Geriatric Medicine, Mental Health, and Epidemiology, Johns Hopkins University School of Medicine and the Bloomberg School of Public Health, USA

Frank R. Lin, M.D., Ph.D., is an Associate Professor of Otolaryngology, Geriatric Medicine, Mental Health, and Epidemiology at the Johns Hopkins University School of Medicine and the Bloomberg School of Public Health. Dr. Lin completed his medical education, residency in Otolaryngology, and Ph.D. in Clinical Investigation, all at Johns Hopkins. He completed further otologic fellowship training in Lucerne, Switzerland. Dr. Lin’s clinical practice is dedicated to otology and the medical and surgical management of hearing loss. His epidemiologic research focuses on how hearing loss impacts the health and functioning of older adults and the role of hearing rehabilitative strategies in potentially mitigating these effects. In particular, his research
group has demonstrated that hearing loss in older adults is strongly and independently associated with the risk of cognitive decline, incident dementia, impairments in physical functioning and mobility, and greater health care resource utilisation in multiple epidemiologic studies. He collaborates extensively with researchers across multiple fields including gerontology, cognitive neuroscience, audiology, and epidemiology, and he has collaborative working relationships with individuals in industry, government, and non-profit advocacy organizations. He has co-chaired or served as a member on several National Academy of Science, Engineering, and Medicine committees related to hearing loss and public health. His research has been extensively covered in the media including the New York Times and the BBC, and he has appeared on CBS This Morning and the Charlie Rose show.

**Hearing, Cognition and Healthy Aging**

Age-related hearing loss in older adults is often perceived as being an unfortunate but relatively inconsequential part of aging. However, the broader implications of hearing loss for the health and functioning of older adults are now beginning to surface in epidemiologic studies. I will discuss recent epidemiologic research demonstrating that hearing loss is independently associated with accelerated cognitive decline, incident dementia, and brain ageing. An ongoing clinical trial (ACHIEVE [Ageing, Cognition, and Hearing Evaluation in Elders] Study) to investigate if hearing rehabilitative interventions can reduce cognitive decline and the risk of dementia in older adults will be discussed. Finally, I will provide some thoughts on future trends in addressing hearing loss as a public health problem.

**Public Health Approaches to Addressing Hearing Loss in Adults**

Uptake of hearing aids around the world remains low regardless of the availability of funding. I will discuss current national initiatives in the United States that are focusing on addressing hearing loss from the public health perspective. These include alternative models of hearing care delivery, top-down initiatives to foment change, and the development of new federal regulations allowing for over-the-counter hearing aids.
Professor Wendy McCracken, Professor of Deaf Education, University of Manchester

Wendy is a Professor of Deaf Education at the University of Manchester, where she is responsible for the mandatory course that trains qualified teachers to teach deaf children. She has completed a national study of the use of FM amplification in real world settings, funded by the Oticon foundation. Prior to this Wendy completed a study on deaf children with additional and complex needs, funded by the National Deaf Children’s Society. She has lectured on this subject nationally and internationally. Prior to working at the university Wendy has wide experience working across the field of deaf education from pre-school to secondary provision. She is a qualified Teacher of the Deaf and Educational Audiologist and has extensive experience of working with deaf children who have additional and complex needs. She has lectured across Europe and in New Zealand, China, India, Australia as well as undertaking work in Romania and Rwanda. She was part of a team that assessed early Intervention for deaf children in Vietnam and is currently undertaking a review of the Visiting teacher service in Ireland. She has numerous publications. She is the National Director of Healthy Hearing which screens athletes with disabilities at the Special Olympics. Wendy is actively involved with Music and the Deaf and NDCS BIG Weekend for families who have a deaf child with complex needs.

Radio aids at first hearing aid fitting

Whilst NHSP has allowed the identification of permanent childhood deafness to be very early identified with hearing aids fitted at 10 weeks, deaf children have not demonstrated a significant improvement in language outcomes that was predicted. Hearing aids, however sophisticated, work optimally up to 1.5 metres. Infants however, are frequently in adverse listening situations where hearing aids will be severely compromised. Infants spend time in car seats facing away from the driver, in forward facing pushchairs, in noisy café, or in supermarkets. All provide great language opportunities that will be unheard with hearing aids alone. The new Radio Aids Quality Standards (2017) states that, “every deaf child should be considered as a potential candidate for provision of a personal radio aid as part of their amplification package, at first hearing aid fitting”. Research suggests that concerns over
parent usage (Cooper and Statham, 2013; Mullah and McCracken, 2014), the development of localisation skills and challenges of reporting problems (Mullah, 2011) are ill founded. Individualised sensitive provision of radio amplification should be a right of every deaf child.

**Professor Colette McKay, Leader in Translational Hearing Research. The Bionics Institute of Australia (Melbourne)**

Professor McKay is an international leader in the field of psychophysics with electrical stimulation, and her multidisciplinary research combines psychophysics, electrophysiology, imaging, speech perception, speech processing and mathematical modelling with the aim of improving outcomes of auditory implants. She contributed significantly to the design and signal processing strategies used in the family of cochlear implants manufactured by Cochlear Ltd. She graduated and received her PhD from the University of Melbourne in the fields of mathematics and physics. From 1991-2004, she was Research Fellow, Senior Research Fellow, and then Principal Research Fellow at the University of Melbourne Department of Otolaryngology. From 2005 to 2013 she held chair and research group leadership positions at Aston University, Birmingham, and Manchester University in the UK. Since 2013 she has led the Translational Hearing Research group at the Bionics Institute.

**Presentation details:**
Thursday 29th June 2017

**Why Does Speech Understanding Vary Among Adult Cochlear Implant Recipients?**
Colette M. McKay
Bionics Institute, 384 Albert St, East Melbourne, Australia

Around 30% of adult CI users have poor speech understanding, and rely upon lip-reading for communication. History factors such as duration of deafness account for only around 10% of the variability in outcomes, making poor prognosis a critical clinical issue. Different physiological mechanisms have been proposed to account for poor speech understanding, including patchy survival of peripheral spiral ganglion cells (SGCs) and plastic changes in the central auditory system or in the cortical networks that
support language processing. Evidence supporting these mechanisms comes from animal studies and from EEG, imaging, or psychophysical studies in human CI users. However, so far it is unclear whether these mechanisms have independent causal effects on speech understanding, how they could be assessed before implantation, or whether they can be reversed after implantation with targeted therapies or specific signal processing strategies. In this presentation, I will summarise recent work at the Bionics Institute in which we found strong correlations between poor speech understanding and the following measures: A) variability in thresholds of highly focussed stimuli in a research CI (evidence of patchy SGC survival) B) poor detection ability of small changes in relative current level across different electrode places and C) high activation levels in the bilateral pre-frontal cortices as measured by a novel brain imaging technique called functional near infrared spectroscopy.

The Bionics Institute acknowledges the support it receives from the Victorian Government through its Operational Infrastructure Support Program.

Dr Lynzee McShea, Clinical Lead for Balance Assessment and Rehabilitation, City Hospitals Sunderland NHS Foundation Trust

Lynzee has worked in Audiology at City Hospitals Sunderland for 12 years, where she is clinical lead for balance assessment and rehabilitation, and for adults with complex needs. She was awarded a Professional Doctorate in 2016 for her work to improve the assessment and rehabilitation of adults with learning disabilities and hearing loss. She designed a caregiver training programme, which has been delivered to over 250 individuals to date and has led to significant improvements in the lives of many adults with learning disabilities. She has had several papers and a book chapter published in this field, and her team have won regional and national awards. She is currently working with NHS England on a project to improve audiological assessment for people with learning disabilities in primary care and is the current Chair of the national Hearing and Learning Disabilities Special Interest Group.

Presentation details: Multidisciplinary Engagement for Adults with Learning Disabilities
People with learning disabilities are more likely to have a hearing loss than the general population, but are less likely to receive diagnosis or management of their hearing loss. The reasons for this are varied, but the support people with learning disabilities receive is relevant. This presentation discusses the key groups involved, and presents a conceptual model to encourage multidisciplinary engagement and greater visibility of audiology in the community.

Friday 30th June 2017

Elizabeth Midgley, Chair, British Society of Audiology

Thursday 29th June 09:00-09:10
Conference Welcome and Happy 50th Year to the BSA

Dr Graham Naylor, Director of the Scottish Section, MRC/CSO Institute of Hearing Research (IHR), Glasgow

Since 1st October 2015, I have been Director of the Scottish Section of the MRC/CSO Institute of Hearing Research (IHR) in Glasgow. I lead the Institute’s research programme in the areas of hearing disability and hearing aids, with projects seeking to understand real-life auditory behaviour, improve methods of assessing disability and intervention benefit, and propose innovative solutions for hearing problems.

Prior to joining IHR, I worked for 20+ years in research in the Danish hearing-aid industry, including from 2000-2013 as Director of Oticon’s Eriksholm Research Centre. Here I directed numerous research projects, which have affected the wider field of hearing aid R&D.

Ted Evans Keynote Lecture: What Can The Eyes Tell Us About Listening?
It is often said that “hearing takes place in the ears, but the brain does the listening”. The eyes provide a window into the activities of the listening brain, and this lecture will provide several examples of the phenomena which can be seen through this window. The primary techniques include pupillometry (measuring pupil size over time) and eye-tracking (measuring gaze direction over time). Gross changes in pupil size are known to reflect changes in cognitive (listening) effort and fatigue, while fine-grained changes may reflect effort-allocation strategies. Meanwhile gross gaze direction reflects the direction of focused attention, while rapid changes reflect problem-solving processes. All of these processes are relevant to success in verbal communication, and can be used to better understand the effects of hearing impairment and improve (or even control) hearing devices.

Bhavisha Parmar, Volunteer
Sound Seekers, London

- Name: Miss Bhavisha Parmar, Paediatric Audiologist
- BSc in Audiology from UCL and MSc in Advanced Audiology from UCL
- Has worked for both NHS and private sector and is specifically passionate about developing paediatric audiology services
- SoundSeekers is a UK based charity, dedicated to helping those with hearing loss in some of the poorest countries in Africa. Bhavisha has been volunteering for SoundSeekers in Lusaka, Zambia since January 2017 as part of a project to set up a targeted hearing screening programme for children at risk of hearing loss. Bhavisha is back in the UK for 1 week before returning to Lusaka for the rest of the year.

Presentation details:
Friday 30th June 2017
Establishing a paediatric audiology service within a government hospital in Lusaka, Zambia
Nicola Phillips, Primary Care Practitioner in Audiology. Abertawe Bro Morgannwg University Health Board

Nicola is from Port Talbot in South Wales. She began her career as a student Audiologist in 1998 and trained at Port Talbot General Hospital, Birmingham teaching hospital and Swansea University. Nicola returned to Swansea University to gain a Masters degree in advanced clinical practice in 2007. Nicola took on the role as Primary Care Practitioner in Audiology for ABMU Health Board in August 2016 and is currently working in six GP practices in the Port Talbot and Swansea area.

The Role of Audiologists in Primary Care - The Welsh Experience

The Primary Care Audiology project aims to reduce demand on primary care and ENT services and improve access for patients. The scheme began on a pilot basis within ABMU Health Board in August 2016. The project is consistent with prudent healthcare values and its main objectives are to: Improve local access to hearing/ear care services. Provide a shorter clinical pathway involving fewer clinicians. Increase patient involvement in decision making using co-production techniques. Improve access to ear-care and wax removal services. Reduce demand on Primary Care staff. Reduce demand on ENT services.

We are nearing the end of the pilot and are in the process of collating final statistics. The project has not been without challenges, however early statistics revealed good outcomes with 40% of patients being discharged without needing a referral into secondary care.
Dr Raymond Reynolds, Senior Lecturer in Motor Control, University of Birmingham

After completing a PhD investigating postural adaptation Dr Reynolds spent 4 years at the Institute of Neurology with Professor Brian Day examining sensory guidance of limb trajectory. He joined the University of Birmingham in 2007. He is currently interested in balance and the vestibular system, both in health and disease. This research is undertaken using physical and sensory perturbations such as Galvanic Vestibular Stimulation, and is funded by the BBSRC and MRC.

Electrical Vestibular Stimulation as a Novel Diagnostic for Inner Ear Dysfunction

Electrical Vestibular Stimulation (EVS) is a simple method for stimulating the vestibular nerve with direct current. It produces a false sensation of head motion which evokes a variety of responses including sway and eye movement. Hitherto, the use of EVS has mostly been restricted to basic research, but it could provide an alternative to existing diagnostics such as caloric irrigation. Here we offer proof of principle that EVS can be used to detect vestibular dysfunction. We studied 29 patients with confirmed unilateral vestibular schwannoma (VS), and compared them to healthy age-matched control subjects. A sinusoidal EVS current was applied separately to each ear (+5mA, 2Hz), and was easily tolerated by all patients. The evoked ocular torsion was recorded in darkness using an infrared camera and tracked off-line. In healthy subjects, stimulation of the left or right ear evoked a torsion response of the same magnitude. In VS patients, stimulation of the affected ear produced a smaller response than the healthy ear, leading to a significant mean asymmetry between the ears of 22% (p<0.05). Patients with larger tumours exhibited greater asymmetry (Koos grade 2 vs 1; p<0.05). These results show that EVS offers an potential alternative test of vestibular dysfunction. Future work will directly compare its diagnostic potential with that of caloric irrigation.
Vicky Sadler, Hearing Therapist, Shrewsbury and Telford Hospital NHS Trust

Vicky Sadler has worked as a Hearing Therapist at The Shrewsbury and Telford Hospital NHS Trust for over 20 years, specialising in rehabilitation in adults with hearing loss and tinnitus. More recently, she was promoted to Deputy Head of Audiology and as part of her academic development has been working towards an MSc in Healthcare Management. Her dissertation focused on the carer experience of living with a spouse who has both dementia and hearing loss. She will be sharing her findings at the BSA conference.

An exploratory study of the experiences of informal carers supporting individuals when their spouse has dementia and hearing loss

Introduction: Since the publication of the Government’s dementia strategy (Department of Health, 2009; 2015), there has been an increasing focus on supporting carers and promoting joined up working across professionals and voluntary organisations. However, there has been little empirical research capturing the ‘lived experience’ of carers within the community, supporting their partner to ‘live well’ with both dementia and hearing loss (Pichora-Fuller, 2013, Social Care Institute for Excellence, 2014).

Title: An exploratory study of the experiences of informal carers supporting individuals who have dementia and wear hearing aids

Design/Methodology: Semi-structured in-depth interviews took place with five female carers, whose husbands were existing hearing aid wearers. The participants were recruited via Alzheimer’s Society carer groups/dementia cafes. Interpretative Phenomenological Analysis (IPA) was used to evolve four overarching themes.

Findings:

- The dilemma of carer intervention in finding ways to support the use of hearing aids
- Carer evolvement of knowledge and skills from a wide range of statutory, voluntary and community support
- The application of adaptive communication strategies by carers to support their spouse to stay socially active
- The importance of evidencing the carer view that hearing loss/hearing aid information should be incorporated within care assessments and care plans.
Discussion:
The research highlights the importance of audiology and dementia services working in partnership to enable individuals and their carers to easily access practical advice and support to find personalised solutions. Carers valued courses, resources and individualised help and signposting between services eg Alzheimer’s Society, Memory services, Audiology and Carer support groups. The findings support other studies about the crucial role carers play in supporting sustained usage of hearing aids and communication, but evidences the wide range of carer intervention strategies.

Conclusion: This study adds the carer’s voice to current research, their experience and pragmatic ideas for ‘supporting well’, when living with the compounding effects of both dementia and hearing loss. Of particular importance is educating and informing people with dementia and their carers about the practical aspects for sustaining hearing aid use, such as early routines, reminders techniques and good communication tactics.

References:
Pichora-Fuller, M et al. (2013) Helping Older People with cognitive decline communication: Hearing aids as part of a broader rehabilitation approach. Seminars in Hearing. Special Issue on Cognitive and Hearing Aids

Keywords: Dementia, Carers, Audiology, Hearing loss, Hearing aids, Care plans
Dr Gabrielle Saunders, Associate Director, National Center for Rehabilitative Auditory Research (NCRAR), Associate Professor, Department of Otolaryngology, Oregon Health and Sciences University, Portland, Oregon

Gabrielle (Gaby) Saunders is the Associate Director of the National Center for Rehabilitative Auditory Research (NCRAR) and an Associate Professor in the Department of Otolaryngology, Oregon Health and Sciences University, both in Portland, Oregon. My primary research interests focus on the application of health behavior theory to hearing health behaviors such as help-seeking, rehabilitation uptake, and prevention of hearing loss. I also enjoy developing new approaches to measurement of hearing-related outcomes, understanding how psychosocial factors impact the quality of life of individuals with hearing loss, and on finding ways to address these impacts through patient-centred education and rehabilitation.

Presentation details:
Thursday 29th June 2017

Provision of Patient-Centred Care for Adults with Hearing Loss: Implications for Audiologists and Their Patients

Patient-centred care is respectful of, and responsive to, individual patient preferences, needs and values, and ensures that patient values guide all clinical decisions. Shared decision, in which clinicians and patients work together to make decisions and select tests, interventions and care plans based on scientific and clinical evidence that balances risks and expected outcomes with patient preferences and values, is thus a key component of patient-centred care. In this presentation, I will discuss the rationale for and potential use of patient-decision aids as tools for assisting in the process of shared decision making associated with audiological rehabilitation. Attendees will learn how and why patient decision aids ensure a more patient-centred approach to decision-making, and how it applies to the practice of clinical audiology.
Dr Magdalena Sereda, Senior Research Fellow in Tinnitus, British Tinnitus Association Head of Research, National Institute for Health Research Nottingham Biomedical Research Centre, Nottingham

Magdalena is a Senior Research Fellow - British Tinnitus Association Head of Research at the NIHR Nottingham Biomedical Research Centre. Her research focuses on assessing the effectiveness of NHS contracted sound therapy options for tinnitus including hearing aids and combination hearing aids. Magdalena graduated from Warsaw University in Biology and obtained a PhD in Neuropsychology from the Institute of Experimental Biology, Warsaw. As a Guest Researcher at Humboldt University, Berlin she was researching animal models of tinnitus. In 2007 she started working as a Career Development Fellow at the MRC Institute of Hearing Research in Nottingham to look at objective characterisation of tinnitus using magnetoencephalography. Over the years Magdalena’s research has concentrated on several aspects of the functioning of the auditory system, including cochlear implant technology and tinnitus. She has 16 years’ experience of working with people with different hearing disorders including tinnitus sufferers, cochlear implant users and deaf adolescents.

Presentation details:
Friday 30th June 2017

Workshop on Recommended Procedure for Fitting Combination Hearing Aids for Tinnitus (alongside Julie Brady)

Combination devices provide both amplification and sound generation, and new generation devices now offer the same amplification features as their 'standard' hearing aid counterparts. According to a recent British Tinnitus Association tinnitus service evaluation 74% of UK audiology clinics can offer combination hearing aids, however the number of people with tinnitus fitted with combination aids varies greatly between different clinics. Fitting protocols are far from standardised with different clinics offering different options (one vs several programmes, enabling volume control or not, type of sound). One of the reasons for those differences is the lack of current UK tinnitus management guidelines and lack of any clear recommendations about candidature and prescription options for combination hearing aids. In 2016 the British Society of Audiology Tinnitus and Hyperacusis Special Interest Group initiated development of evidence-based tinnitus management
guidance for audiologists, and a recommended procedure for fitting combination hearing aids. The first step was a UK wide survey that gathered the opinions of hearing professionals regarding candidacy and fitting practices for combined amplification and sound generation for tinnitus. The survey highlighted the areas of considerable variability in practice including: i) criteria for candidacy, ii) setting the level of sound, iii) type of sound/s used, iv) adjustments applied to the sound, v) laterality of fitting, vi) number and types of programmes used, vii) recommendations on time per day the devices should be used. The next step will involve a Delphi survey (series of questionnaires with feedback) among UK hearing professionals experienced in prescribing and fitting combination hearing aids. We will identify those topics where there is consensus and those where consensus was not reached. The areas where agreement is reached will inform recommended procedures for candidacy and fitting of combination aids for tinnitus and hearing loss. The areas where there is no consensus will directly inform new research questions. During the workshop we will invite hearing professionals to discuss those topics around candidacy and fitting of combination hearing aids where clinical practice is variable. We will explore the reasons and motivations for different approaches and information gathered will directly inform the Delphi survey and ultimately aid development of guidelines and recommended procedure.

Dr Priya Singh, Director of Education/Senior Lecturer, UCL Ear Institute, London

Priya has spent the past 6 years as Director of Education and a Senior Lecturer at the UCL Ear Institute. Prior to this, she has worked as a Clinical Audiologist in both the NHS and private health sector and spent a great deal of the past 20 years in diagnostic audiology and managing audiology services. Priya’s research and professional interests include hearing preservation and hearing loss prevention, improving quality in audiological services, business management and leadership in audiology practice, and international audiology education and training.
NIHL and Medico-Legal Considerations in Audiology

Medico-legal audiology is gaining great momentum in the UK with the number of claims being made, increasing year on year. While noise-induced hearing loss (NIHL) is usually associated with industry and military exposure, the current context and understanding of NIHL from an audiological perspective will be discussed, including the considerations for Audiologists wanting to expand their remit into medico-legal audiology. There will be a brief overview of the relevant guidance and statutory regulations, including the Coles, Lutman and Buffin guidelines (CLB guidelines) used in the UK.

Joseph Sinnott, ENT Registrar, University Hospitals Bristol NHS Foundation Trust

Joseph Sinnott is an ENT registrar in Bristol. He is currently working at Bristol Royal Hospital for Children undertaking a placement in paediatric otology and cochlear implantation. He has widely published in all areas of ENT but has a particular interest in otology.

Audit of Vestibular Patients and Any Instructions Given Regarding Driving

Patients suffering with vertigo are commonly encountered within audiological services, specialist balance clinics, general ENT and otological clinics. The DVLA has comprehensive guidance on when patients should inform them about their dizziness. It is the patient’s responsibility to inform the DVLA about their condition. However, the clinician has a duty to advise the patient that they should discuss their condition with the DVLA. A retrospective audit of one hundred patients with dizziness was performed looking at the driving advice given. The results showed that there was a significant lack of advice given about driving. There are multiple likely reasons for this deviation from guidelines. The purpose of this presentation is to clarify the current guidelines on when we should be advising...
patients to inform the DVLA and to make recommendations for best practice in the future.

Dr. Tony Sirimanna MS BS, DLO(RCS), MS, MSc, FRCS(Ed.), FRCP(Hon.), Consultant Audiological Physician, Great Ormond Street Hospital NHS Foundation Trust, London

Dr. Tony Sirimanna is a senior consultant at Great Ormond Street Hospital NHS Foundation Trust in London (GOSH) with nearly 25 years of experience in Audiovestibular Medicine (AVM). He is currently the Medical Advisor to The NHS Newborn Hearing Screening Programme. He was the founder Chair of the BSA APD Interest Group and has been a member of that group since. His interests include General Paediatric Audiology, Bone Anchored Hearing Aids (BAHAs), Aetiological Investigations of Hearing Loss, Auditory Processing Disorder (APD) and Auditory Neuropathy Spectrum Disorder (ANSD). He has personally seen over 2000 suspected APD patients from a wide referral base.

Presentation details:
Friday 30th June 2017

APD in Children

David Strachan, Consultant ENT & Implant Surgeon, Bradford Royal Infirmary

Qualifications:
MBChB (Leeds) 1986
FRCS (Eng) FRCS (ORL), Dip HSM (York)

Training: Otology Fellowship in Bordeaux 1990-91
ORL Training in Yorkshire 1992 - 1999
Fellow of the Royal College of Surgeons of England since 1992

David Strachan is a Consultant Ear Nose & Throat Surgeon with a special interest in Otology and Implantion Surgery. He was appointed as a Consultant ENT Surgeon at Bradford Royal Infirmary in February 2000 and prior to that had trained in the Yorkshire Regional Rotation with 2 specialist training fellowships in France (Bordeaux, Cannes & Nancy). Mr Strachan is one of the
regional Cochlear Implant surgeons working in the Yorkshire Auditory Implant Centre - a service that has implanted over 1000 patients. He has presented his experience at meetings all over the world and publishes regularly in peer reviewed journals. Since 2014 he has been actively involved in developing an otology service in Malawi, Southern Africa (including cochlear implantation). He also plays golf regularly and harmonica in a blues band.

Presentation details:
Friday 30th June 2017

ENT UK Collaboration

As well as outlining various otological projects supported by ENT UK in developing countries and outlining plans for potential future working collaborations with the BSA this will also be a ‘personal story’ of how I came to be involved in this area of work. It’s a story starting with a ‘relaxing sabbatical’ and ending with developing a cochlear implant programme in Malawi, Africa, the 8th poorest country in the world. Well, hopefully not ‘ending’!

Gemma Twitchen, Senior Audiology Specialist, Action on Hearing Loss

Gemma Twitchen is a Senior Audiology Specialist at Action on Hearing Loss with around 10 years’ experience of working as an audiologist in the NHS across a number of services within England. She worked in adult rehabilitation, complex patients, paediatrics and was Supervisor to students on placement from UCL and a student examiner.

She has worked for Action on Hearing Loss’ Research and Policy team for over 5 years supporting the organisation with expert knowledge of audiology and has been heavily involved in the recent campaigning against the cuts to hearing aid services in England.

Gemma also has a passion for improving ear and hearing health in the developing world and has volunteered in Malawi and Zambia for six months in 2011 and 2015. She volunteers for the charity Sound Seekers as a member of their Project Committee.
She is Chair of The BSA Global Outreach Specialist Interest Group.

**Commissioning, Cost-Effectiveness and Cuts**

Hearing aid services for adults have been under threat for some time and sadly considered an ‘easy target.’ We saw the unprecedented implementation of cuts to hearing aid within North Staffordshire in 2015 and have been battling against similar proposals since. This talk will provide an overview from Action on Hearing Loss on the different forms of cuts that we’ve seen implemented or proposed and how so far, they have largely been overturned. As there is a lot of uncertainty about what may happen in the future the talk will also highlight what to do should you find your service being threatened with cuts, draw on some of our experiences of working with Commissioners and where to find good practice examples to help make your service more efficient that could act as a deterrent for cutting.

**Introduction to the Session and the Global Outreach Specialist Interest Group**

There is a lot of work going on globally within developing countries who have little or no audiology support and are often supported by UK audiologists. The BSA has always been involved in Global outreach work and has now formed a Specialist Interest group to lead in this area. This very short introduction will cover who we are as the Global outreach specialist Interest Group, what our plans are for 2017/2018 and how you can be involved. This will lead into the rest of the session that includes exciting and inspirational talks from around the globe to really highlight the issues, challenges and the opportunities to be involved in humanitarian audiology. Small changes can make a big impact.
Dr Sarah Whitaker, Senior Clinical Psychologist, Royal Surrey County Hospital

I am a Senior Clinical Psychologist with a special interest in working with people who have long term physical health conditions, such as balance disorders and pain. I have also worked with people who are struggling to maintain a balanced healthy lifestyle, taking into account eating and exercise habits.

My work is primarily informed by Acceptance and Commitment Therapy (ACT) and mindfulness. I also use CBT and incorporate compassion focused approaches when it is helpful.

I enjoy working with people to focus on what they are struggling with now and look at the patterns of behaviour that keep them feeling stuck. We then explore what scope there is to make changes to these patterns that help them move forwards and doing more of what matters to them, even when there are difficulties present.

Presentation details:
Friday 30th June 2017

Innovations in Cognitive Behavioural Therapy in Vestibular Rehabilitation

My work in Vestibular Rehabilitation moves away from aiming to cure symptoms to developing skills to help people live with symptoms that won't go away. In this session I hope to introduce ideas around working pragmatically with the biology and psychology of anxiety, low mood and Vestibular disorders. I also hope to discuss how avoidance plays a role in increasing symptoms and how approaching symptoms can be a more workable way forwards.

Finally we will explore the process of spotting patterns in body and behaviour that feed vicious cycles of avoidance and increase symptoms.

I hope that this will be an interactive session with some exercises aimed to bring these ideas to life.
Dr William Whitmer, MRC IHR Affiliate Scientist (Institute of Health and Wellbeing), MRC/CSO Institute of Hearing Research - Scottish Section, Glasgow

I’ve whittled away a few decades with hearing-aid design, development and evaluation, sound localization, patient-reported outcome measures and good ol’ psychophysics. I also take a fancy to unconventional hearing prostheses (rethinking the transducer, receiver, and bits between), more ecological validations (surely there’s a better bridge between the lab and the field) and better measures of benefit. I was born in the former screw capital of the world and now live in the former shipbuilding capital of the world.

Abstract 1 (Friday, 30th June, 1100-1230, Reading Room)
Title: Tinnitus Guidance and a Quality Standard for Scotland
Whitmer, W.M., Lamerton, D., MacDonald, C.L.
The Scottish Tinnitus Audiology Group (STAG) has undertaken a programme to better establish tinnitus care across NHS Scotland. The first step of this programme was a survey of heads of service to identify consensus and dissent in approaches. This lead to a call for a protocol to standardise tinnitus service, with input across audiologists at the annual STAG meeting in 2015 as to which components of the tinnitus patient pathway are obligatory and which are discretionary. The protocol was refined and finalised as a minimum standard of practice when a clinic is referred a patient with tinnitus. A crucial addition to the protocol are summaries of therapies, as the opportunity for specialist therapy care also varies geographically. Upon completion of the guidance protocol, STAG developed a quality standard for tinnitus to complement the quality standard for audiology in place since 2009. The primary goal of these documents is to bolster patient care. They also bolster equivalence across clinics (i.e., reduce “postcode lottery” effects), and further allow all of NHS Scotland to act as a tinnitus research platform.

Abstract 2 (Friday, 30th June, 1530-1700, Carriage Suite)
Title: Applying just noticeable differences to hearing aid fittings
Authors: Whitmer, W.M., Caswell-Midwinter, B., McShefferty, D., Naylor, G.
Abstract:
The pure-tone threshold is the one brush with psychophysics a patient has during a hearing-aid fitting. Adjustments to the hearing aid are done either based on previous training or fitting software, both of which vary widely in guidance. Tolerances for meeting gain prescriptions are recommended (e.g., ±5 dB for .250-
2 kHz; ±8 dB for 3-4 kHz) without evidence of perceptual relevance. These crucial steps to providing adequate, comfortable gain for the patient could be made more perceptually relevant - establishing reliable preferences from the patient - by applying just noticeable differences (JNDs).

To investigate what adjustments are detectable, we measured JNDs for gain changes away from a prescription reference for speech shaped noise. The JNDs for 65 listeners of varying hearing ability were estimated at six octave bands from .25-6 kHz using either a three-alternative forced choice adaptive procedure, where listeners judged which of three intervals was different, or a same-different fixed-level procedure, where listeners judged whether two intervals were the same or different. Sounds were presented monaurally over headphones to each listener’s better ear. Across procedures, median frequency-gain JNDs ranged across frequency from roughly 4-6 dB. JNDs were independent of hearing ability, but weakly correlated with measures of cognitive ability. These results suggest that the preset 1-dB adjustment in hearing-aid fitting software does not foster reliable patient feedback. Future work will look at how troubleshooting guidelines (e.g., what to do when a patient reports their devices are “too tinny”) can be improved with gain JNDs.

We have also used JNDs to explore what is a noticeable speech intelligibility benefit (McSheffery et al., 2015), which is relevant for tempering expectations from noise-reduction programmes during fitting. Here we will briefly discuss a new experiment comparing changes in the speech-to-noise ratio across different noises. The data suggest a gap between psychophysical intelligibility – measures of recognition accuracy – and subjective intelligibility – how clear it sounded. [Supported by intramural funding from the Medical Research Council (grant number U135097131) and the Chief Scientist Office of the Scottish Government]

Jane Wild, Head of Adult Audiology Services, Betsi Cadwaladr University Health Board, Wales

Jane has worked for the NHS in Wales for 23 years. She is a Consultant Clinical Scientist and currently Head of Adult Audiology Services at Betsi Cadwaladr University Health Board. Jane is currently Vice Chair of the BSA Adult Rehabilitation Interest Group (ARIG), the new Editor-in-Chief of Audacity, the BSA magazine, a member and Welsh representative of the BAA Service Quality Committee (SQC) and one of the Clinical members of the NICE Guideline Committee for Hearing Loss. Jane has been the National Coordinator for the external audit of Services in Wales against Quality Standards for Adult Rehabilitation and was part of the Welsh/Scottish Working Group that developed the second version of these evidence based Standards. Jane has a particular interest in the development and implementation of patient centred quality services.

Presentation details:
Thursday 29th June 2017

Setting up an Audiology service at HMP Berwyn, the UK’s largest Prison

In September 2013 it was confirmed that a new Category C ‘super prison’ would be built in North Wales to house over 2000 men. It was to be the first public sector prison to be opened in England and Wales since the 1990’s. HMP Berwyn opened in February 2017 and aims to have rehabilitation at its heart, with health and wellbeing being considered to be an important part of this. There is some evidence to suggest that incidence of hearing loss in the prison population is higher than in the general population and that unmet needs exist for hearing impaired prisoners in England and Wales. This presentation will outline the journey of the Audiology department in North Wales from initial proposals to service delivery at HMP Berwyn.
Dr Nicola Wright PhD, MA, PGCHE, BN (Hons), RN (Mental Health)
Assistant Professor in Mental Health, School of Health Sciences,
University of Nottingham

Nicola has been a registered mental health nurse for more than 15 years. Her clinical career has incorporated both inpatient and community mental health settings. She completed her PhD in 2009 and has held a number of academic posts. Since 2013 she has held the position of Assistant Professor in Mental Health at the School of Health Sciences, University of Nottingham. Nicola is also the Associate Editor for the Journal of Mental Health, Training, Education and Practice and a regional panel member for the NIHR Research for Patient Benefit funding stream. Nicola has published extensively in the area of mental health and her research interests to date have focused on service user engagement with mental health services, care transitions in mental health and the implementation and adoption of clinical guidelines. Her work around transition has been cited within the recent NICE guideline focusing on this topic.

Presentation details:
Thursday 29th June 2017

Multidimensional and Patient Centred Approaches to Mental Health and Cognitive Impairment (speaking with Dr David Charnock)

Healthcare services and practitioners are dealing with increasing levels of complexity as individuals have longer life expectancy (the Marmot Review in 2010 identified that of people over the age of 68, 75% will have at least one long term condition), technological advancements become more available (including devices and drug treatments) and new models of working adopted. These developments mean that NHS resources need to go further and decisions regarding the rationing of treatments (who gets what and when) become increasingly difficult and political. This can be particularly challenging for people with hearing loss, mental health problems and cognitive impairment where the nature of their difficulties can be invisible (in comparison to other physical ailments), intractable and difficult to find solutions to. Within this context, practitioners become confused by logical aspects of the person’s presentation which coexist with behaviours and symptomatology which appear illogical and disordered. As a result clinicians with the subject expertise and the pressures of working within health services can often simplify the situation so that we meet the outcomes required; but as professionals this can lead to feelings of frustrated and a perception that patient needs have not been fully met. Using practice based examples we explain how
complexity theory can help us to see how order and disorder can exist alongside each other. This new perspective assists us to simplify difficult episodes of care by remaining with and simultaneously appreciating the complex nature of systems and the individuals who inhabit them.
Oral Abstracts

Thursday 29th June

Presenting Author: Amyn Amlani
Session: Service Development and Professional Issues

Amyn M Amlani¹, PhD¹, Derek Beaudoin¹, Megan Nelson-Paula¹, Emily Bodish¹

Department of Audiology & Speech-Language Pathology, University of North Texas, Denton, Texas, USA¹

Title and Content: Sound-Quality Ratings of Traditional and Over-the-Counter Amplification Products Obtained Under Real-World- and Laboratory-Listening Conditions

The World Health Organization (WHO) estimates that 360 million citizens globally could benefit from amplification devices, yet only a small portion of citizens adopt this technology. There are several reasons for the low adoption rate, including lack of substitute products, high retail price, lack of standardized hearing healthcare procedures and education, and too few user controls. In the United States, the President’s Council of Advisors on Science and Technology (PCAST) and the National Academies of Science, Engineering, and Medicine (NASEM) recently recommended that over-the-counter (OTC) products be considered for direct consumer use. To date, very little is known about the direct-to-consumer products, both electroacoustically and behaviorally. In this study, we compared sound-quality-performance ratings provided by a group of 10 of an OTC product, a smartphone-based hearing aid application (SHAA), and each subject’s own hearing aids under everyday- and simulated-laboratory listening environments in a repeated-measures format. The everyday-listening environments consisted of (1) quiet (e.g., watching TV, one-on-one conversation), (2) noise (e.g., coffee shop, restaurant), and (3) reverberant (e.g., place of worship). In the laboratory-listening condition, we created digital sound files that simulated these everyday environments. We included the laboratory-listening condition to provide clinicians and, ultimately, the end user to assess whether a clinical environment provided adequate perceptual information that can assist both parties in determining whether a direct-to-consumer product provides adequate amplification in everyday-listening environments. During the study, the device worn and the listening environments were counterbalanced. Findings will be presented as a comparison of quality ratings among (1) amplification types (OTC, SHAA, traditional hearing aid), and (2) the everyday- and laboratory-listening conditions.
Presenting Author: Sara Alhanbali
Session: Implantable Devices

Sara Alhanbali¹, Dr Piers Dawes¹, Simon Lloyd², and Kevin J Munro¹, ³

Manchester Centre for Audiology and Deafness, School of Health Sciences, University of Manchester, Manchester, M13 9PL¹
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Title and Content: Perceived and actual hearing difficulty predict self-reported listening effort and self-reported fatigue

Objective: Hearing loss may increase listening-related effort and fatigue due to the increased mental exertion required to attend to, and understand, an auditory message. Because there have been few attempts to quantify self-reported effort and fatigue in listeners with hearing loss, that was the aim of the first study. The aim of the second study was to identify potential predictors of listening effort and fatigue by investigating their correlation with self-reported hearing difficulty, speech recognition ability and pure tone hearing thresholds.

Design: Three groups of hearing-impaired adults and a control group of adults with good hearing took part in Study One: (i) hearing aid users [HA, n= 50; 55-85 years]; (ii) cochlear implant users [CI, n=50; 55-80 years]; (iii) single sided deafness [SSD, n=50; 58-80 years]; (iv) controls [n= 50; 55-78 years]. The 10-item generic Fatigue Assessment Scale (FAS) and the 6-item listening Effort Assessment Scale (EAS) were used to quantify fatigue and effort, respectively. 84 hearing-impaired adults (65-85 years) took part in Study Two. Participants completed the (FAS), (EAS), and the Hearing Handicap Inventory for Elderly (HHIE; a self-reported hearing difficulty scale). Audiometric assessment included pure tone audiometry and speech recognition in noise. Results: Study One: The median generic fatigue score for the control group was 14 and around 22 for each of the three hearing-impaired groups. The median listening effort score for the control group was 20 and around 70 for each of the three hearing-impaired groups. All hearing-impaired groups reported significantly increased effort and fatigue compared to the control group, but there was no difference between the three groups of hearing-impaired adults. There was a weak positive correlation between generic fatigue and listening effort (r = 0.40, p < 0.05). Study Two: There was a significant positive correlation between self-reported hearing difficulty (HHIE) and fatigue (r = 0.39, p < 0.05) and self-reported hearing difficulty and listening effort (r=0.73, p < 0.05). There were significant (but lower) correlations between speech recognition ability and fatigue (r = 0.22, p < 0.05) and listening effort (r=0.32, p < 0.05). There was no significant correlation between hearing level and fatigue or listening effort. Conclusion: Hearing-impaired individuals report high levels of listening effort and fatigue compared to controls. The similarity between the different hearing-impaired groups, and the lack of correlation with hearing level, suggest that audibility per se does not explain effort/fatigue. Perceived hearing difficulty (and to a lesser extent actual hearing difficulty measured using speech recognition in noise) predicts self-reported listening effort and
fatigue. The findings are consistent with the Motivation Control Model of effort and fatigue which hypothesises a relationship between effort/fatigue and perceived performance.

Presenting Author: Dr Piers Dawes
Session: Hot Topics in Audiology: Mental and Cognitive Health

Title and Content: Are changes in sensory function associated with cognitive decline? Longitudinal analysis in European older population

Background The prevalence of hearing and/or vision loss and cognitive impairment increases sharply in old age. Hence, the explanations for relationships between sensory and cognitive function remain unclear. The purpose of this study was to assess in an older European population: (1) any independent association between single and dual sensory impairment (hearing and/or vision) and cognitive decline; (2) cognitive trajectories according to the pattern of sensory impairment. Methods We used two surveys on older individuals in Europe: the Survey of Health, Ageing and Retirement in Europe (SHARE) for 10 Continental European countries and English Longitudinal Study of Ageing (ELSA). Growth curve analysis with time–variant variables of sensory impairment was performed to predict cognitive function measured by episodic memory score (range 0-20). Vision and hearing function in SHARE and ELSA were each coded on a scale from 1 (excellent) to 5 (poor). We recoded the scores of hearing and vision function into two categories by combining the responses excellent, very good and good into good sensory function and collapsing fair and poor vision into poor sensory function. We defined sensory impairment as having poor sensory function and categorised it into three: no impairment, single impairment (vision or hearing), and dual impairment (vision and hearing).Results Older adults in England with single (β=-0.154, ?<0.001) and dual impairments (β=-0.369, ?<0.001) performed less well than those with no impairment in final model, where the potential confounders, including socio-demographic, health behaviour and health status characteristics, were included. Similarly, older adults with single (β=-0.289, ?<0.001) and dual impairments (β=-0.727, ?<0.001) were able to recall fewer words than those with no sensory impairment in other ten European countries included in SHARE. In both surveys, the cognitive trajectories of older adults with no sensory impairment followed curvilinear shapes, while those of older adults with single and dual sensory impairments showed more precipitous pattern trajectory of cognitive decline after the age of 50 in both surveys. Conclusions: These findings suggest that sensory impairment was independently associated with cognitive decline among older adults in Europe. Further investigations should shed light on causal connections among them.
Introduction: Dedicated paediatric vestibular services are not widely available in the UK. However, there is a growing interest in vestibular disorders in children and young people. Children may present with otological, neurological, psychological, neuro-developmental and other causes. Therefore, the underlying diagnosis of the presenting clinical features may be different to that in adults. Objective: The objective was to demonstrate the variation in the clinical features, corresponding audiovestibular diagnostics and the final diagnosis in a cohort of children. Method: This is a retrospective service evaluation of the first 2-years (November 2014 to October 2016) of a dedicated paediatric vestibular service. Only a limited number of older children who completed vestibular diagnostics were included. This is due to numerous limitations in service delivery. Children are initially assessed clinically, along with auditory tests, by an Audiovestibular Physician jointly with a Senior Audiologist. Selected children subsequently undergo Video-Nystagmography (VNG) and Caloric tests, carried out on a monthly basis. There is access to other medical investigations and multi-professional rehabilitation services. Results: During the 24 months, 18 children (11 boys and 7 girls) completed clinical and diagnostic vestibular assessments. They ranged from 8 to 16 years (median age = 13.5 years). Referrals came from Paediatrics (10), Occupational Therapy (3), ENT (2), GP (1), Physiotherapy (1) and a Community Children’s Nurse (1). They had medical, neurological, neuro-developmental, otological, ophthalmological and psychological backgrounds. Audiologically, 14 children had normal hearing. Two had newly-diagnosed sensorineural hearing loss (SNHL), one had progressive SNHL and one had congenital profound SNHL (unilateral cochlear-implant user). Fourteen children had normal clinical vestibular examination. Abnormalities included ocular-motor dysfunction (2), significant central neurological signs (1) and abnormal Unterberger’s test (1). VNG was normal in 15 children. Two had abnormal nystagmus without visual fixation and one had significant central neurological features. Caloric test was normal in 10 children. Seven had unilateral Canal Paresis ranging from 24-41%, indicating peripheral vestibular dysfunction (PVD). One had bilateral absent responses. The final impression of aetiology was multi-factorial (4), migraine-related (3), neuro-developmental (3), psychogenic (2), normal (2), PVD only (1), Pendred syndrome (1), Acute Disseminating Encephalomyelitis (1) and labyrinthitis with a significant psychogenic overlay (1). Conclusion: Vestibular presentations in children are heterogeneous. Therefore, clinicians should be aware and explore the multi-faceted reasons, over and beyond otological causes, in children. At present, our vestibular diagnostics are limited to VNG and Calorics. In addition, we are currently working around the service delivery limitations and are networking with relevant stakeholders.
Friday 30th June

Presenting author: Kieran Joseph
Session: Paediatric Audiology Interest Group

Kieran Joseph¹, Sarah Laister¹

Children & Young People's Audiology Centre, St Thomas' Hospital²

Title and content: Moving beyond the warble tone: The Hummingbird clinic and assessment of children with Autism and complex needs.

It can often require a number of appointments to establish conclusive hearing test results in children with Autism and complex needs. To try and streamline the assessment process and reduce the number of appointments required for these children a specialist assessment centre called 'The Hummingbird Clinic' was created. Following a charity grant in 2010, the paediatric Audiology team at St Thomas’ Hospital in London were able to create an environment specifically for children with sensory processing difficulties and introduce a comprehensive assessment package. Prior to an appointment a pre-assessment questionnaire is completed by both the parent and the nursery/school. The results from these questionnaires are then used to tailor the session to each child. Not only does this allow us to select the most desirable toys for each child, it also allows us to pre-select the most optimal test stimuli and reinforcers. Our use of band-pass filtered music enables us to obtain frequency specific hearing information. As part of the redesigning of the clinic environment, the ability to use video to record sessions was also set up. This is particularly useful for analysing the results of children who elicited non-conventional responses to Audiological stimuli. In a few cases where we are unable to obtain satisfactory behavioural test results in the Hummingbird clinic, we have established a conclusive pathway with the Evelina children’s hospital for performing auditory brainstem response testing under sedation/general anaesthetic. Audit following the implementation of the clinic has revealed a significant reduction in the number of appointments required to meet local discharge criteria and patient feedback has been very favourable. Given the difficulty validating hearing aid fittings using behavioural assessment in some of our complex needs cohort we have recently introduced aided cortical assessments. Using the HEARlab system we are able to use ‘speech’ stimuli to assess aided benefit. This subsequently enables us to consider objective results, alongside the feedback received from significant others, when making amplification adjustments. Feedback from both parents and professionals has been extremely positive about the introduction of aided corticals as part of our complex needs assessment package for hearing aids users.

Presenting Author: Dr Soumit Dasgupta
Session: Paediatric Audiology Interest Group

Dr Soumit Dasgupta¹, Dr Spyridakou Chrysa²³⁴⁵
Assessing a child’s vestibular system entails special skills and expertise and is essentially an art. Children with vestibular disorders present with a different symptom spectrum than adults and often, the history is surrogate and obtained from the parents. A thorough history leads to formulate a cause for the problem. This is followed by a meticulous examination of the vestibular system in the child which involves a full dedicated and customised paediatric clinical test battery in children which has to be tailored to the child’s age and development. After the clinical test battery, vestibular investigations are undertaken that include a full VNG examination with and without optic fixation; vestibular spinal tests with static posturography; otolith function tests; the video head impulse test; rotatory chair tests and the vestibular evoked myogenic potentials. The eventual goal is to obtain frequency specific information of the entire vestibular sensory epithelia to customise rehabilitation to achieve the most favourable outcome. The cerebral plasticity in children dictate that the outcome following customised rehabilitation is probably better than in adults. Common difficulties in assessing children from the vestibular angle are difficult cooperation; difficulties in obtaining surrogate history; difficulties to follow instructions; difficult gaze fixation; small skull diameter for formal testing to attach the Frenzel head bands; significant comorbidities especially neurological and the significant overlapping with neurological disorders. Nevertheless, vestibular assessment in children need to be performed in every case especially due to the observation that as many as a third of hearing losses would be accompanied by a vestibular affliction as well and isolated vestibular involvement in children up to the age of 15 cannot be underestimated. In addition, effective diagnosis and successful rehabilitation lead to a rewarding outcome. General awareness is low about vestibular pathologies in children. This lecture discusses vestibular assessment in children by 2 senior audiovestibular consultants, both working in tertiary centres with a wide and varied clinical experience between them.

Presenting author: Dr Doris-Eva Bamiou
Session: Balance Interest Group

Bamiou DE 1, Kikidis D 2, Rammazzo L 1, Bibas A 2, Maes L 3, Mucci V 3, Celis L 3, Ihtijarevic B 3, Wuyts F 3, Maurer C 4, Luxon LML 1

UCL Ear Institute & UCLH Audiological Medicine Department 1, London UK
ENT clinic Hippokrateion Hospital University of Athens 2, Greece
Research center for Equilibrium and Aerospace University of Antwerp, Belgium
Neurology clinic University of Freiburg, Germany

Title and content: The European Commission FP7 funded EMBalance project aims to develop a Decision Support System (DSS) to support clinical decision-making and facilitate diagnosis and treatment of balance disorders.

The EMBalance DSS (Exarchos et al., Comput Biol Med. 2016) was validated with a randomised controlled clinical trial. 200 patients presenting with persistent dizziness (duration >3 months) were recruited at primary care services across Germany, Greece, Belgium and the UK and randomised in two groups, with DSS (+DSS) and without DSS (-DSS). In each group, non-specialist doctors examined the patients, and suggested a diagnosis and management plan. Subsequently, specialist consultants at tertiary care hospitals in the field of Neuro-otology/Audiovestibular Medicine, reviewed each patient’s case (blinded to use or non-use of the DSS and to the diagnosis provided by the non-specialist) and validated the diagnosis and management plan that were proposed by the non-specialist and by the DSS, according to a predetermined “gold standard” agreed by the consortium members. Primary outcome was the percentage of agreement between the non-specialist doctors’ recommendation (+/-DSS) with the supervising experts’ recommendation. Secondary outcome was the percentage of agreement between the DSS recommendation and experts’ recommendation and for the patients who received a correct diagnosis in the two groups, the patients’ dizziness handicap at 3 months follow up after management. 194 patients completed the study. The difference in percentage of agreement of non-specialist with experts in the +/-DSS use groups was statistically significant for management (in 48% of cases in the +DSS vs 31.2% in the –DSS group, p<0.05) and marginally not statistically significant for diagnosis (in 54% in the + DSS group compared to 41.5% in the -DSS p= 0.081). The diagnostic accuracy of the DSS for first and second line correct diagnosis (i.e. diagnosis that agreed with Expert opinion) was 63%. This was significantly better than no agreement (in 37%) at p < 0.01. The best diagnostic accuracy of the DSS was for Ménière’s disease (100%), Cerebellar/pontine lesion (86%), BPPV (80%) and “persistent postural perceptual dizziness” (PPPD) (75%). In terms of patient outcome the proportion of patients with moderate/severe and no/mild dizziness handicap was similar in the two groups at baseline but significantly different at 3 months after management in the two groups, p< 0.01, with a smaller proportion of patients with moderate/severe handicap in the +DSS group. In conclusion, the EMBalance DSS may provide a structured and detailed diagnostic and management plan for several common/high impact vestibular disorders that may improve patients’ diagnosis and symptoms. The EMBalance DSS will require further development, but holds promise in ensuring that patients with a vestibular disorder are diagnosed and managed in a timely, efficient and effective manner.
Patient preferences in tinnitus care

This is the first in depth exploration of what tinnitus patients hope for in terms of outcomes and treatments for tinnitus. This work is funded by the British Tinnitus Association. Background: Tinnitus patients are heterogenous with a range of responses and coping behaviours. At present patients tend to be prescribed interventions by clinicians and do not actively contribute to the decision making process. This leads to clinician led variation in preferences for intervention and disagreements about emphasis on psychological or neurophysiological approaches (McFerran and Baguley, 2009). There is considerable national variation in tinnitus care in the NHS in England (Hoare, 2010), which may reflect a lack of patient involvement in decision making. Where patient preferences are not recognized, clinicians are likely to prescribe interventions that do not meet their individual needs.

This study aimed to employ qualitative research approaches to bring patient report of preferences into the discourse on tinnitus care.

Objective: To identify patient preferences in care for tinnitus.

Methods: In depth interview study informed by Grounded Theory.

Results: We conducted interviews with 41 patients who had sought help for tinnitus across a range of locations and tinnitus services in England. Preferences for outcomes were for both the abolition of tinnitus and for improved coping and management of the tinnitus. Preferences for treatment were for individualised care, tailored information and for interventions to assist with psychological adjustment and auditory distraction. Adoption of interventions to manage tinnitus were based on a trial and error approach.

Conclusions: Patients preferences for individual interventions varied but were informed by the information they received. Practice implications: Information plays an important role in care for people with tinnitus. Patients hold individual preferences and require engagement in shared decision making.
Title and content: High Prevalence of Cisplatin-Induced Ototoxicity in Paediatrics in Johannesburg, South Africa

Background: Although Cisplatin is highly effective in the treatment of soft tissue cancers, it is also attributed to high incidence of ototoxicity, particularly in paediatrics, affecting 13%-96% of patients. Objectives: To document the prevalence of Cisplatin-induced ototoxicity in paediatric patients. Study design: A cross-sectional retrospective review using results obtained during ototoxicity monitoring for patients treated with cisplatin chemotherapy was conducted. Data obtained during ototoxicity monitoring including a baseline audiogram using both Conventional and Extended High Frequency Audiometry as well as Distortion Product Otoacoustic Emissions (DPOAEs), fortnightly screenings using the same baseline audiogram protocol, an exit audiogram as well as screening at 6 weeks post cessation of chemotherapy were used for analysis. Descriptive statistics in the form of percentages and frequency tables were used to determine the presence, type, and degree of hearing loss as well as the presence of tinnitus and otalgia. Study Sample: one-hundred and ninety-six patients aged between 11 and 18 years who underwent cisplatin chemotherapy at Charlotte Maxeke Johannesburg Academic Hospital between January 2010 and December 2015. Results: Twelve percent of the participants did not develop ototoxicity. A total of 84% of the participants developed hearing loss of varying degrees during treatment. In addition, 4% participants presented with delayed onset of hearing loss which was only detected at the 6 weeks post treatment screening. Additionally, while 60% of participants presented with profound SNHL, 12% had a moderate to severe high frequency sensorineural hearing loss and 12% presented with a moderate hearing loss in the extended high frequency range (8000 Hz to 16000 Hz). Diminished DPOAEs were observed in 72% of the participants with hearing loss. Worth noting, only 66% of the participants were diagnosed with ototoxicity with conventional audiometry. Three percent of the participants presented with mixed hearing loss while 4% had conductive hearing loss. In addition, 78% of the participants presented with chronic cerumen impaction throughout the course of chemotherapy. high pitched tinnitus was diagnosed in 56% of the participants while 27% reported otalgia. There were no other observed auditory deficits observed in the study sample. Conclusion(s): This study highlights a high prevalence of cisplatin-induced ototoxicity in paediatrics in Charlotte Maxeke Johannesburg Academic Hospital and thus recommends large scale research throughout tertiary hospitals in the country. In addition, this study also highlights the need for experimental studies in the prevention of cisplatin ototoxicity to prevent the negative impact of cisplatin-induced hearing loss in paediatrics.
Title: Personality trait and tinnitus habituation

Poster Number: 1

Author(s): Menbere Amsalu¹, Kai Uus¹, Justine Sweet², Kim Archary²

Affiliation(s):
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²Kingston Hospital NHS Foundation Trust, London

Content: Abstract Objective: The treatment outcome of tinnitus varies hugely between patients. Although certain personal characteristics such as neuroticism has been reported to be more predominant in patients with chronic tinnitus, no research has investigated how personality trait influence tinnitus habituation. We examined whether personality trait has an influence on tinnitus sufferers ability to adapt to a tinnitus sound. We also investigated if personality trait is stable after someone adapts to a tinnitus sound. Design: This is a single blind study. Participants completed the EPQ-R questionnaire and were grouped into the extraversion or neuroticism personality trait. All participants were fitted with noise generators and were followed up 1-month and 3 –months after treatment. The THI questionnaire was used to measure the participants’ habitation. Study sample: 19 participants with chronic subjective tinnitus Results: no significant difference were found in THI score change pre-and-post treatment between the extraversion and neuroticism group. A Mann-Whitney U Test revealed that there was no significant difference in the THI score change between the extraversion (n = 12) and neuroticism (n = 6) group, U = 23.5, z = -1.18, p = 0.24, r = 0.42. Personality trait remained stable pre-and post-treatment. Conclusions: Personality trait does not influence tinnitus habituation. As there is no previous study that have controlled personality as a variable in tinnitus patient’s ability to adapt to their tinnitus sound, this is a preliminary study for future researches.Key Words: Tinnitus; habituation; personality trait; noise generator
Introduction: Bimodal hearing through a cochlear implant (CI) and contra-lateral hearing aid (HA) may be considered an appropriate way to achieve the potential benefits of binaural hearing for deaf adults as NICE (2009) currently recommends only unilateral cochlear implantation in most cases. There is little research exploring the impact of bimodal hearing in daily listening situations, adults’ reasons for choosing to use the contra-lateral HA or why many give it up. Further, little is known about awareness, protocols or clinical practice of audiologists working in hearing aid clinics and the community regarding bimodal hearing and its management.

Methods: This study was carried out in three parts: 1) National online survey of adults with a unilateral CI regarding the decision to use a hearing aid and cochlear implant. 2) Qualitative interview study of adult CI users exploring their experience with bimodal and non-bimodal listening and the impact on communication and quality of life. 3) National online survey of audiologists working in hearing aid clinics and the community to consider awareness of bimodal hearing and current service delivery.

Results: The outcomes provide interesting findings about? Perceived quality of bimodal hearing in daily listening situations? Impact on communication, quality of life, benefits, challenges and future needs? Provision of advice to those contemplating a contra-lateral hearing aid and ongoing support? Influences on the decision to use the contra-lateral hearing aid or not.

Discussion: Adult users of bimodal hearing reported benefits in sound perception and quality; however some adults found limited or no benefit. Audiologists strongly influence decision-making; however advice about the introduction of a contra-lateral hearing aid and management of bimodal technology appears to be inconsistent. This presentation will discuss factors which influence decision-making and how clinicians may better support the provision of binaural hearing for adults with cochlear implants.
identified from their vestibular assessment appointments. They all then received the standard VR program of one initial appointment followed by a follow up in clinic in 6-8 weeks. The experimental group were then also given two Skype follow up appointments in between. Four questionnaires were used to assess outcomes: the international physical activity questionnaire (IPAQ), the vestibular rehabilitation benefit questionnaire (VRBQ), the agnew relationship measure, short-form (ARM-S) (to look at the clinician-patient relationship and its effects), and a meta-cognition questionnaire. These were all filled in by each participant twice once at the initial appointment and again at the face to face follow-up, where it was also assessed whether the patient could be discharged from clinic. An additional final questionnaire about participants feelings in regards to using a telecommunication system like Skype for health appointments (this was adapted dependent on which study group the participant was in). Study Sample: 15 participants were recruited, 14 of which completed the program. These were randomly assigned to either the experimental or control group (7 in each); 11 female participants and 3 male. All participants were found to have a clinically significant peripheral unilateral vestibular weakness (=20% asymmetry shown through caloric testing). Results: This study is part of an MSc dissertation project and the results are still being gathered. These will be included on the poster when presented.

Title: Listening across the life span: What you have to do determines how you listen
Poster Number: 42
Author(s): Johanna Barry12, Aina Casaponsa13, Viktoria Vianeva1, Michael Akeroyd1
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1 MRC Institute of Hearing Research, University of Nottingham, Nottingham, UK
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Content: Listening across the life span: What you have to do determines how you listen
Introduction: Speech-in noise listening is known to decline with age, with considerable evidence to suggest that as it does so older listeners become more reliant on cognitive and linguistic skills (Pichora-Fuller 2008). However, most of this research is based on tasks specifically sensitized to capture differences in cognition or language. In this study, we assessed the impact of task design on conclusions about how listening changes across the lifespan using two different tasks. One task (Cole et al. 1980) involved continuous listening while detecting mispronunciations. The second task (Barry et al. 2014) involved repeating short sentences out loud. In both tasks, linguistic context was modulated to assess the role of language in supporting listening. We predicted equivalently poor performance by the older adults for both tasks. We further predicted increased reliance on cognitive and linguistic skills in this group for both tasks. Methods: Two groups of participants with age normal hearing completed both listening tasks in quiet and in a 4-speaker babble noise and tests of non-verbal IQ, serial memory,
and working memory. The older adults (n = 32) had a mean age of 64 years with better-ear pure tone averages (PTA) between 2.5 – 41.5 dB (M = 15.8 dB). The younger adults (n = 32) had a mean age of 23 years and better-ear PTAs between -3.6 – 15.7 dB (M = 2.3 dB). Results: Continuous listening task: both groups were significantly worse at detecting mispronunciations in babble compared with quiet (p<.001). There was a significant predictability effect in the older adults only (p = .03). PTA primarily predicted mispronunciation detection. Sentences in noise test: The older adults performed significantly worse than the younger adults (p < .001) with a marked effect for predictability in both groups (p < .001). In addition to PTA, performance in the older adults correlated with working memory and non-verbal IQ. Discussion Task design plays an important role in influencing study outcomes. The continuous listening task involving error detection suggested changes in listening were primarily related to age-related hearing loss. By contrast, the more cognitively demanding task involving recall of sentences suggested cognitive abilities were also implicated. References Barry, J. G., et al. (2014). Poster. BSA. Keele. Cole, R. A., Perfetti, C. A. (1980). J. Verb Learn Verb Behav, 19, 297-315. Pichora-Fuller, M. K. (2008). Int J Audiol, 47 S72-S82.

Title: The Relationship Between Tinnitus Severity And Sleep Effort

Poster number: 3

Author(s): Hema Bath¹, Dr Sheila Fidler²

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Content: The prevalence of sleep disturbance amongst tinnitus sufferers is 50% (Hallam, 1996). Previous studies show a strong correlation between questionnaires assessing tinnitus severity and insomnia, exacerbating symptoms of day-time sleepiness, fatigue, anxiety and depression. Subjective insomnia occurs when individuals attend to the inability to sleep, has an unusually strong intention to sleep and consequently has increased effort to get to sleep, when sleep should occur naturally. This behaviour, defined as sleep effort, only results in increased stress arousal, agitation and inadvertently exacerbates insomnia. The Glasgow Sleep Effort Scale, developed by Broomfield & Espie (2005) is shown to have high sensitivity and specificity of differentiating between good sleepers and those with subjective insomnia. This is a 7-item questionnaire which measures sleep effort. Effective treatment for sleep effort include mindfulness meditation, cognitive-behaviour therapy and paradoxical intention therapy. There are currently no studies assessing the relationship between sleep effort and tinnitus severity. The aim of the study was to assess if there is a relationship between tinnitus severity and sleep effort. The objective was to see if there is a significant correlation between the Glasgow Sleep Effort Scale (GSES) and the Tinnitus Handicap Inventory (THI) while controlling for anxiety, measured using the Generalised Anxiety Disorder 7-
item scale (GAD-7). Thirty adults with tinnitus (and no history of insomnia, anxiety or depression) aged between 24-64, including 15 males and 15 females were recruited at Southend University Hospital (UK). Results show significantly strong correlation (r=0.721, p=<0.001) between the THI and GSES. Partial correlation also revealed the relationship between THI and GSES was significantly strong even when anxiety was controlled for (r= 0.683, p=<0.05). The findings indicate there is a strong relationship between tinnitus severity and sleep effort. The GSES may be a valuable clinical tool for identifying and providing treatment for sleep effort amongst tinnitus patients, however more research is needed in this area.

Title: North Wales Audiology Community Volunteers: Outcomes from the first year of a transitioned service
Poster number: 4
Author(s): Dr Sarah Bent¹, Dylan Williams¹, Natasha Roberts¹, Lowri Taylor¹, Julie Williams¹, Emma Cowan¹, Jane Wild¹
Affiliation(s): ¹ Betsi Cadwaladr University Health Board
Content: Introduction: Volunteer support for people with hearing aids in North Wales has been in place for a number of years, provided by both Action on Hearing Loss and Hearing Aid, a local Audiology-led charity. On the 1st April 2016, the Big Lottery funding for the Action on Hearing Loss scheme ‘Hear to Help’ ended in Wales. There was agreement that this valuable volunteer support will continue and that Audiology in Betsi Cadwaladr University Health Board would manage and coordinate the service in North Wales. Method: A plan was drawn up to detail the actions required to ensure both a smooth and effective transition, and the ongoing delivery and development of the volunteer support service. It was agreed that hearing aid volunteer support should be accessible for patients across all geographical areas of North Wales, through a variety of points of delivery to include home visits, drop in clinics and nursing/care home visits. The scheme also aimed to be coordinated with other volunteering and fundraising schemes where appropriate and beneficial to do so, and to follow a prudent service model of co-production and Aston team based working. Results: This poster describes the outcomes from the service over the first 12 months since the transition, including service uptake, geographical coverage, patient reported outcomes, patient reported experience and volunteer experience measures. Discussion: Service outcomes from year one have been demonstrated, along with initial progress with further developments to the service. Active involvement of volunteers and local stakeholders in further developments are in place to support this forward-looking service. This has been a successful transition to an Audiology-managed volunteer service across a large geographical area.
Title: Looking and Listening: Variability in the benefits obtained from visual speech when listening to clear and degraded speech in background noise

Poster number: 5

Author(s): C.L. Blackburn¹, P. Kitterick², G. Jones?, P. C. Stacey¹

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Content: Perceiving speech in background noise presents a significant challenge to listeners, particularly to individuals fitted with cochlear implants. However, seeing the face of a talker is known to improve speech perception. A recent study by Stacey, Kitterick, Morris & Sumner (2016) found that when listening to speech in multi-talker babble, participants obtained more benefit from visual speech information when presented with sine-wave vocoded speech than non-degraded speech. It is possible however, that benefits from visual speech information might vary according to the type of background noise that is used and according to the audio intelligibility of the target talker. Experiment one tested twenty-four participants on their ability to identify words in sentences when listening to sine-wave vocoded or clear speech in background noise that consisted of either (a) a single other talker, (b) two talkers, or (c) sixteen talkers. The results show a large benefit from visual speech information across all conditions, with the largest visual speech benefit found for conditions in which there was one background talker. However, there was no significant difference in benefit across the type of speech, clear or vocoded, or between background noise types. Experiment two tested whether the benefit from visual speech varies if the target talker used in the stimuli varies in audio intelligibility. Twenty-four participants were tested on the benefit received from visual information for four different target talkers who varied in their audio intelligibility for both clear and vocoded speech in a sixteen talker background noise. Results show visual speech benefit was found across all talkers and this benefit generally increased as the audio intelligibility of the talker decreased. These results have implications when conducting new research, when replicating other studies, as well as for assessment of performance of cochlear implant users. In particular, the audio intelligibility of the testing stimuli should be considered to enable accurate assessment of performance and to compare performance over time and across patients and cohorts. Reference Stacey, P. C., Kitterick, P. T., Morris, S. D., & Sumner, C. J. (2016). The contribution of visual information to the perception of speech in noise with and without informative temporal fine structure. Hearing Research, 336, 17-28.

Title: Development of a novel method for investigating acoustic stealth awareness
Content: Acoustic stealth awareness refers to the behaviour associated with remaining acoustically undetectable in the presence of a nearby enemy or prey. For example, if a soldier must approach an enemy and remain undetected, it is important that the soldier has an awareness of their acoustic output (footfall, communication) so as to avoid making themselves detectable by the enemy. The factors associated with acoustic stealth awareness are unknown and require research. An understanding of the role of hearing ability in acoustic stealth awareness is particularly relevant for assessing auditory fitness for duty in military personnel. The aim of the current project is to develop a robust method to assess the role of hearing ability in acoustic stealth awareness. This presentation shows progress to date on the development of the new method. The experimental task currently in development involves the subject estimating if a nearby observer can detect a sound that is presented close to the subject. To control the acoustic environment, the task takes place in an anechoic chamber. The visual environment and nearby observer conditions are created using a virtual reality headset. Initial findings are presented and discussed. An outline of further experimental work involving military and hearing impaired listeners is shown and implications for auditory fitness for duty are discussed.
varying quality that cannot be easily interpreted and applied in clinical settings. This issue is compounded by the marked variability in patient outcomes, lack of definitive studies of factors accounting for this variance, and the rapid expansion of candidacy criteria to include those with greater levels of residual hearing up to single-sided deafness. As a consequence, recommendation guidelines used around the world are variable and often largely written based on current clinical practices, as opposed to strong and un-biased objective evidence. This scattered evidence base may also be one of the barriers contributing to the low proportion of adults who may benefit from cochlear implantation who are actually referred for implantation candidacy evaluation. This scoping study, including over 10,000 peer-reviewed articles, aims to quantify the range of research topics, levels of evidence, and applicability of the evidence base available in the field. The methodology is based on an integrated interface developed specifically for the purpose of automating scoping and systematic reviews. This approach is chosen to facilitate updates of future scoping study, which would provide an overview of the development of the evidence base over time. This information will help better target future research, including the direction of systematic reviews, and support the development of objective clinical guidelines and decision-aids.

Title: Optimum Use of Tympanometry in Adults with Down Syndrome

Poster number: 7

Author(s): Dr Siobhan Brennan¹, Marie Kirkland¹

Affiliation(s): ¹Sheffield Teaching Hospitals

Content: People with Down Syndrome should have yearly hearing checks due to higher risk of middle ear problems and early onset hearing loss. Hearing checks are not always straightforward; relying on different tests including Tympanometry (middle ear check). Shallow or flat tympanometry results can suggest middle ear problems but not always in adults with Down Syndrome who tend to have small ear canals and middle ear features possibly causing misleading results. Referral to Ear, Nose and Throat specialists may be based partly on tympanometry results so it is useful to check the best test settings are being used for adults with Down Syndrome. For example their ear canal resonant frequency (on which test settings partly depend) may be very different from the general public. Perhaps this should mean using different settings for more accurate results, or different typical tympanometry values to compare with. Adults with Down Syndrome will be invited to have movement of their ear drum and ear canal volume measures (tympanometry), resonant frequency of their ear canal measured, their ear drum and ear canal looked at (otoscopy) and photographed (video otoscopy). Hearing assessment and informal questions will rule out current middle ear problems. Results will be explained and compared with a control group.
Title: Speech Localisation and Orientation when listening in noise: A developmental perspective

Poster number: 8

Author(s): Rhiannon Brook\textsuperscript{1}, Dr Owen Brimijoin\textsuperscript{2}, Professor Michael Akeroyd\textsuperscript{1}, Dr Padraig Kitterick\textsuperscript{3}, Dr Johanna Barry\textsuperscript{14}

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\textsuperscript{4}Nottingham University Hospitals NHS Trust

Content: Background - Listening to speech in a noisy environment can be challenging. Adopting a different head orientation, by turning or tilting the head, can alter the levels of signal and noise in a way that may be beneficial for listening. The optimum head orientation for a noisy environment will vary depending upon the locations of the signal and noise. Listeners do not always utilise the most beneficial head orientations, suggesting the use of head orientations is a complex skill. The aim of this study is to understand more about the developmental trajectory of these orienting skills and whether deficits in these abilities contribute to the listening difficulties associated with Auditory Processing Disorder (APD). Described here is the first stage of a study proposing to understand the role of orientation skills in APD. This study is aimed at understanding more about the developmental trajectory of localisation skills, specifically for speech in noise (SiN). Methods 20 children, age 6 to 16 years old, and 4 adults, aged 18 to 30 years old, will be tested. All participants will speak English as their first language, have normal hearing and no developmental or learning disorders. Listeners will sit within a ring of 24 speakers. Noise will be emitted from several speakers and a speech sentence will be emitted from one other speaker. The listener must indicate which speaker they heard the speech from. An adaptive test method will be used to find the signal-to-noise ratio (SNR) at which the listener achieves 50% left-right accuracy. Our hypothesis is that younger children will require a larger SNR to achieve 50% left-right accuracy than older children and adults. Discussion This study aims to increase understanding of the relationship between age and ability of children to localise SiN. Following this, orientation ability of children listening to SiN will be investigated. An experimental design similar to that of the initial study will be used, but will also track the head movements of listeners. It is important to understand localisation prior to orientation, so as to attribute any age-related changes to the correct process.

Title: Hearing screening in the state of Gujarat
Poster number: 50

Author(s): Jeff Davies¹, Wendy Stevens¹

Affiliation(s): ¹De Montfort University

Content: Background & aims
Hearing loss is an unseen disability which affects hundreds of millions of people around the world. In India, around 63 million people have a significant auditory impairment (WHO, 2016). Despite recent government efforts to prevent and control deafness, a severe lack of funding, facilities and manpower continue to restrict the initiative. Garg et al. (2009), report that the audiologist to patient population ratio is 1:500,000, however such healthcare practitioners are often located in urban areas whereas over 70% majority of India’s population are rurally located (Consensus, 2011). This creates additional geographical restrictions when trying to access audiological healthcare.

Recently, audiology staff and students at De Montfort University (DMU) launched the DMU square mile India hearing screening project. The aim of this project was to provide free audiological examination, hearing tests and hearing aids to the local residents of Wankaner, a small rural town in the state of Gujarat. In addition to the provision of audiological care, the DMU square mile hearing screening project also presented a timely opportunity to undertake a prospective, cross-sectional observational study of hearing loss.

Methods
Patients aged 5 years and older were invited for a free audiological consultation at Devdaya diagnostic centre in Wankaner. The hearing screening programme was advertised in local newspapers and through word of mouth. The consultation briefly comprised of an audiological history, otoscopy and a pure tone audiogram hearing check using a portable audiometer. Middle ear evaluation via tympanometry was also available. Digital receiver-in-ear hearing aids were fitted to patients deemed clinically suitable by the audiologists. Red flag otological symptoms were referred onwards to an ENT consultant. All aspects of the clinical consultations were translated into Gujarati by the local hospital staff. Written and pictorial information was also given and written informed consent was obtained from all patients or their legal guardians in the case of minors.

Findings
Over a two day period 170 patients were screened; 116 males and 54 females. Patients were aged between 6-94 years (mean: 58 years, S.D: 17.7 years). A wide range of otological symptoms and conditions were observed including tinnitus in 70 patients (41%), perforated ear drums (22%), active ear discharge (15%), occluding wax (12%), otalgia (8%) and a history of noise exposure (5%). Audiometry was carried out on 153 patients. Average hearing threshold configuration showed a bilateral moderate to severe sensorineural hearing loss which was slightly worse in males. Twelve patients had normal or mild hearing loss and did not require a hearing aid. Monaural hearing aids were offered to 97 (57%) patients, 88 of which reported listener benefit and agreed to wear the aids on a daily basis. The remaining 44 patients were not considered suitable for hearing aids.

Title: Auditory Processing, Receptive Vocabulary and Reading Comprehension in 5th Year Elementary School Students
Poster number: 30

Author(s): Ana Flavia de Oliveira Nalom¹, Professor Eliane Schochat¹

Affiliation(s): ¹USP, Sao Paulo, Brazil

Content: Introduction: Auditory processing (AP) is defined as the way in which the nervous system deals auditory information. The integrity of the auditory pathway is indicated as a prerequisite for an effective teaching-learning process (reading and writing). The receptive vocabulary refers to the words that the child is able to comprehend and is a predictor of reading performance in elementary and primary education, from 6 to 14 years old. Successful reading requires intact decoding skills (auditory and visual) and understanding of oral language. In this regard, verifying the association between such abilities in 5th grade students is relevant, since the recognition and understanding of the words’ meaning facilitates the process of decoding and reading comprehension. Aim: To verify the performance of 5th year elementary school students in AP, receptive vocabulary and reading comprehension and investigate possible correlations between the two. Method: The research corpus is composed of 15 subjects (7 female and 8 male) students of the 5th grade of private elementary school. The auditory abilities were evaluated with following behavioral auditory processing tests: pediatric speech intelligibility test (PSI), Dichotic Digit Test), Pitch Pattern Frequency Test and Staggered Spondaic Words Test (SSW). The receptive vocabulary was evaluated by the Vocabulary Test for Figures USP (TVfusp) and reading comprehension by the PROLEC test. Descriptive statistical analysis was performed to determine the means, medians and standard deviations of the variables of interest. To measure the correlation between such variables, the Pearson correlation coefficient (r) was calculated. Results: The means and medians of the PSI, Dichotic Digit and Test of Frequency Pattern Test were above the reference values for the age group. At least 50% of the individuals presented below-expected performance in SSW. The subjects’ performance in assessing receptive vocabulary and reading comprehension is, on average, within the reference values for the 5th year of elementary school. A linear correlation was observed between: Frequency Pattern Test and TVfusp (r = 0.20); SSW (left ear) and TVfusp (r = 0.38); Dichotic Digit (right ear) and TVfusp (r = 0.50); And TVfusp and PROLEC (r = 0.22). Conclusion: The worst performance of the subjects was observed in SSW test. The results observed in the behavioral evaluation of AP seems to predict the results in the receptive vocabulary test. It’s suggested that this topic be deepened with a larger number of subjects, in order to understand better the correlation of PA variables and receptive vocabulary in relation to reading comprehension, not only in private teaching, but also in the public school.
Title: Novel MRI techniques for examining structure and function of the central auditory pathway

Poster number: 34

Author(s): Dr Rebecca Dewey, Dr Garreth Prendergast, Professor Susan Francis, Professor Deborah Hall, Professor Christopher Plack

Affiliation(s):

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4Manchester Centre for Audiology and Deafness (ManCAD), University of Manchester

Content: Background: Animal studies show that short-duration noise exposure and low-level noise exposure are sufficient to cause permanent damage to high-threshold auditory nerve synapses. This does not affect sensitivity to quiet sounds, only to supra-threshold sounds, such as speech in noise. It has yet to be determined whether “hidden” hearing loss is associated with a physiological change measurable in humans. The long-term aims of this neuroimaging study are to determine: which MRI measures in the human central auditory system are associated with hidden hearing loss whether these measures are also associated with tinnitus or hyperacusis

Methods: Structural and functional MRI data were collected on a Philips Ingenia 3 T MR scanner with a 32-element head coil. We compare structural images with different image contrasts (T1 TFE, T2 TSE, balanced FFE), to improve the confidence in identifying the relevant nuclei involved in auditory processing. Detection of sound-evoked activation was optimised by comparing different functional MRI (fMRI) scan parameters: continuous versus sparse acquisition, cardiac gating, and active noise cancellation. In each condition, broadband noise was presented for 24 seconds followed by a rest period of either 42 or 64 seconds between successive stimuli. Data were corrected for distortion and motion, and spatially smoothed. Statistical analyses were performed using a general linear model of stimulus onset, offset and duration, with motion parameters, white matter and cerebrospinal fluid nuisance regressors as covariates of no interest.

Results: T2-weighted images provided the most useful structural information. fMRI data acquired using the cardiac-gated sparse scheme were limited to 10 slices, and thus challenging to plan to ensure total coverage. fMRI using continuous acquisition (TR = 2s) gave 20-slice coverage, as well as improved signal-to-noise per unit time. This provided adequate functional contrast-to-noise within the brainstem (specifically inferior colliculus). Following full optimisation of stimulus presentation to present at a higher level and reduction of the rest period to 42 s, activations in auditory cortex reached statistical significance in a single individual, corrected for family-wise error.

Conclusions: We have optimised structural and functional imaging schemes to allow anatomical definition of regions of interest and sound-evoked activations in the ascending auditory pathway. Acknowledgements: This work is supported by MRC reference MR/L003589/1 awarded to the University of Manchester. The authors report no conflicts of interest.
Title: Reducing social isolation in individuals with hearing impairment and dementia within a residential care setting.

Poster number: 9

Author(s): Nisha Dhanda¹, Dr Helen Pryce-Cazalet¹, Dr Amanda Hall¹, Dr Carol Holland¹

Affiliation(s): ¹Aston University, Birmingham

Content: The theories relating to the mechanisms underlying the association between hearing loss and cognitive decline broadly fall under two categories; neuro-psychological mechanisms and social isolation/withdrawal mechanisms. The former relates to physiological changes that result in a slowing of neural transmission, which are related to a slowing of information processing that may affect cognitive functions such as working memory, whilst the latter refers to daily functioning and communication. There has been limited research into the effects of social isolation on the relationship between hearing impairment and cognitive decline, and therefore a better understanding of this mechanism would present an opportunity to provide meaningful management solutions for individuals living with these two concurrent conditions. It has been well documented that cognitive decline and dementia do not only impact the individual alone, but their caregivers and society too (Wimo and Prince, 2010). Therefore any model that could prevent or reduce cognitive decline, and enhance an individual’s daily function and communication abilities would be of great benefit to patients in the community and residential care settings (Dawes et al., 2015). Our work aims to investigate older adults with hearing loss and cognitive decline, who are particularly vulnerable to social withdrawal and isolation, not least because of communication difficulties faced on a daily basis that are largely overlooked. Since existing interventions do not currently address the effects of hearing loss and cognitive decline as a dual impairment, an intervention to reduce social isolation in these individuals is required to impact quality of life in a positive way. As there is such a high prevalence of individuals with hearing impairment and cognitive decline living within a residential care setting, this community will be of specific interest and therefore the demographical data of participants will be sought to determine the amount of individuals living with both conditions, who are also experiencing social isolation. The specific social skills that have been affected will also be investigated in order to design an intervention that will optimise communication as both elements of hearing and cognition need to be incorporated, rather than just focussing on the ability to understand and produce speech alone. Furthermore, by improving the building blocks of social interaction such as communication and social inclusion, and identifying the impact on the ability of individuals to socially engage, there may be the possibility for a change in function relating to cognitive ability. This may initially involve interventions on an individual basis to understand the key components of social interaction, before group interventions are possible.
Title: North Wales Primary Care Audiology Service – Initial Evaluation and Future Developments

Poster number: 10

Author(s): Beverly Soden¹, Matthew Evans¹, Sarah Canton¹, Jane Wild¹

Affiliation(s): ¹Betsi Cadwaladr University Health Board, Wales

Content: IntroductionIn June 2016, Betsi Cadwaladr University Health Board (BCUHB). Recruited three Audiology Primary Care Area Leads to develop and implement the first Primary Care Audiology Service in the UK. This was driven by the current GP recruitment crisis across North Wales and a need to deliver a sustainable model of working. This new service allows patients with hearing, tinnitus and BPPV direct access to an Advanced Audiology Practitioner.

Method: BCUHB covers a patient population of 694,000. The Health Board consists of three main hospitals and is geographically divided into three areas across North Wales. The West area covers Gwynedd and Anglesey, Central area covers Conwy and Denbighshire and the East area covers Flintshire and Wrexham. Each Primary Care Lead is responsible for piloting the service within their area. Currently the service operates within 26 GP surgeries across BCUHB. Anticipated recruitment should increase capacity to allow for 6 more GP practices to be able to access the service, taking a predicted total during year 2 to 32 practices. This is just over a quarter of all practices in BCUHB. Data was recorded for each patient seen and results from a patient questionnaire analysed. This allows ongoing evaluation and monitoring of the service.

Results: The collection of audit data started in August 2016. Initial Pilot data was collected in the first 3 months prior to expanding the rollout. The service was rolled out to capacity in December 2016 and subsequently further data has been gathered to analyse the impact of the service.

Discussion: We evaluated the benefit of this service in terms of GP appointment time saved, patient satisfaction and quality of referrals into secondary care. The next steps in terms of service development and rollout are discussed.


Title: Hyperacusis in adults: a scoping review to assess the current position and determine priority research.

Poster number: 11

Author(s): Dr Kathryn Fackrell²³, Iskra Potgieter³, Dr Giriraj S Shekhawat¹⁴, Professor David Baguley²³, Dr Derek Hoare²³

Affiliation(s):

¹Health Systems, The University of Auckland
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Content: Background: There is no universally accepted definition for hyperacusis but in general it is characterised by decreased sound tolerance to ordinary environmental sounds. 8 - 15% of the general adult population experience hyperacusis, and for them it can have a devastating effect on daily life, negatively impacting on emotional well-being, hearing, sleep, and concentration, causing anxiety and interfering with speech perception in noise. Despite its prevalence and clinical implications, hyperacusis research is in its infancy and much remains unknown about the current management strategies. Purpose: To establish the current position of clinical research on hyperacusis, and identify research gaps to direct future research. Design Review strategy and reporting were based on the six-stage methodological framework of Asksey and O’Malley (2005). Study sample: Included records were identified using PsycINFO, Embase, PubMed, Google Scholar, and manual searching of relevant journals and a reference list of articles. Out of 2,622 titles identified, 44 records met our inclusion criteria. Incorporating content and qualitative thematic analysis approaches, the definitions of hyperacusis provided by authors and the management strategies and outcome measures were recorded and examined. Results: Over 30% of the studies did not define what they meant by hyperacusis. The remaining studies described hyperacusis as “unusual tolerance to ordinary sounds”, or “intolerance to loudness of sounds”, or “abnormal perception of loudness”. The main management strategies reported were Tinnitus Retraining Therapy, counselling and sound generators, surgery and Cognitive Behavioural Therapy (CBT). Only 14 studies included patients reporting hyperacusis as a primary complaint, and of these the majority were case reports. Only one study reported a randomised controlled trial specifically evaluating the effectiveness of CBT on patients with a primary complaint of hyperacusis, showing significant improvements in severity following CBT. Outcome measures reported for assessing hyperacusis included Loudness Discomfort Levels, the Hyperacusis Questionnaire, Tinnitus Retraining Treatment interview, the Sound Hypersensitivity Questionnaire and author-developed questionnaires. Conclusions: Management strategies were typically evaluated in patients reporting hyperacusis as a secondary compliant or as part of a symptom set. As such the outcomes reported only provided an indication that they are effective for hyperacusis. Randomised controlled trials are needed to evaluate the effectiveness of these management strategies for patients experiencing hyperacusis.

Title: Core Outcome Domains for early-phase clinical trials of sound-, psychological-, and pharmacological-based interventions to manage chronic subjective tinnitus in adults: The COMIT’ID study protocol for using a Delphi process and face-to-face meetings to es

Poster number: 51

Author(s): Dr Kathryn Fackrell, Harriet Smith, Adele Horobin, Veronica Colley, Brian Thacker, Haülá F. Haider, Alain Londero, Birgit Mazurek, Deborah A. Hall
Content: If all clinical trials for tinnitus used and reported results for the same set of agreed outcomes, they could be compared and combined. This would make it much easier and quicker to identify effective interventions and in turn improve management of tinnitus. A set of outcome domains (e.g. loudness, concentration or fatigue) and instruments that have been agreed upon is called a Core Outcome Set, which should be the minimum standard collected and reported in every trial of tinnitus. A crucial first step is to identify what outcome domains are important to measure (known as a Core Domain Set) from the perspectives of professionals and healthcare users worldwide. It is possible, given the diverse nature of tinnitus, that certain outcome domains are only meaningful to measure for particular types of treatment. The present study, using online Delphi surveys, aims to gain consensus on the important domains to measure corresponding to (i) Sound-based, (ii) Psychological-based and (iii) Pharmacological-based interventions. Three separate Delphi surveys corresponding to the three interventions were launched online in March 2017. We aim to recruit at least 420 participants, including healthcare users, healthcare practitioners, researchers, commercial/industry representatives and funders of tinnitus research worldwide. Each Delphi survey comprise three rounds of an online questionnaire. The questionnaire items are the same each round and in each Delphi survey. Questionnaire items are a list of candidate outcome domains generated from information gathered from two systematic reviews on outcome domains and qualitative analysis of existing questionnaires. Participants will be asked to rate how important each outcome is to measure when deciding if that particular tinnitus treatment is working using 1–9 scale. In the subsequent rounds, feedback will provide their previous scores plus a summary of the stakeholder groups’ scores. Based on this information, participants will be given the chance to change or keep their score the same. Outcome domains will only be considered for inclusion in the Core Domain Set, if 70% of all participants in each stakeholder group score 7–9 on the scale, and fewer than 15% score 1–3. The study will conclude with three face-to-face consensus meetings that will seek to finalise the Core Domain Set for each intervention category. The next stage will consider how the identified Core Domain Sets should be measured, which outcome instruments should be used, and establish the three intervention-specific Core Outcome Sets that should be adopted in all clinical trials for these interventions internationally. Funding Clinical advisors on the Research Steering Group were part supported by a COST Action framework (TINNET BM1306). Additional grants were obtained from the British Tinnitus Association for patient and public involvement and Action on Hearing Loss for the licensing of the bespoke Delphi Manager software (University of Liverpool).
Title: Are hearing aids effective for adults with mild to moderate hearing loss?

Poster number: 52

Author(s): Melanie Ferguson¹, Padraig Kitterick¹, Derek Hoare¹, Mark Edmondson-Jones¹, Fiona Barker²

Affiliation(s):
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² University of Surrey, Guildford

Content: Evidence-based practice requires the integration of individual clinical expertise, patient values and preferences alongside the best available clinical evidence. Systematic reviews including a meta-analysis provide the highest level of clinical evidence, with Cochrane Reviews at the pinnacle as they focus on well-conducted controlled trials. A Cochrane Review has been conducted to assess the effectiveness of hearing aids for adults with mild to moderate hearing loss (MMHL).

The review was prompted by two reasons. First, the last systematic review on hearing aids only included studies up until 2004 (Chisolm et al., 2007), and so the time is right to update this evidence. Second, potential changes to the funding of hearing aids in the NHS have highlighted the need for high-quality evidence to inform clinical decision-making.

The review protocol has been published by the Cochrane Collaboration (Ferguson et al., 2015). The review includes randomised controlled trials and cross-over studies only, and participant samples had MMHL as defined by the World Health Organisation. The primary outcome measure was self-report of hearing-specific health-related quality of life (QoL), and secondary outcome measures were health-related QoL, listening ability and adverse effects. If multiple questionnaires were used, we used outcome measures ranked using a pre-defined hierarchy in the meta-analyses.

The search was carried out on the 23rd March 2017 across a range of electronic databases. 2840 abstracts were identified for screening, which led to 5 studies being included in the review, and 3 in the meta-analyses. A large positive effect of hearing aids was shown for hearing-related QoL (MD = -26.47, 95% CI -42.16 to -10.77; participants = 772; studies = 3). There was a small positive effect for generic health-related QoL ability (SMD = -0.38, 95% CI -0.55 to -0.21; participants = 568; studies = 2). Two studies reported a large positive effect of hearing aids on listening ability (SMD = -1.88 95% CI -3.24 to -0.52, participants = 534). No adverse effects were reported.

The review shows that hearing aids are effective in improving hearing-related QoL, generic QoL and listening abilities. This is consistent with the hearing aid provision used as the first-line clinical management in those that seek help.
This Cochrane review alongside a registered systematic review on alternative listening devices, and a horizon scanning review of new and emerging technologies will provide up-to-date high-level evidence on the effectiveness of a wide range of listening devices for adults with MMHL.


Title: Optimising hearing-related communication for carehome residents with dementia (ORCHARD): a realist synthesis

Poster number: 66

Author(s): Melanie Ferguson1,2, Brian Crosbie2, Geoff Wong3, Dawn-Marie Walker4, Stevie Vanhegan5, Tom Dening2

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5Patient and Public Involvement

Both hearing impairment and dementia are common in care homes. Hearing impairment occurs in 70-90% of residents, and dementia in about 75%. Together, the two can be formidable barriers to communication. Managing hearing loss in care homes is complex. Testing hearing in dementia is difficult. Other problems contribute to poor communication: care homes are often noisy, making communication harder for people with poor hearing; aphasia in dementia exacerbates the impact of deafness; residents and care staff often have different backgrounds and some don’t speak English as their first language.

Hearing aids are often supplied, but problems can arise such as the resident doesn’t tolerate the aid or understand what it’s for, may be unable to operate it, or may simply destroy it. Care staff may lack knowledge and skills to support hearing aid use, or may not value the effort required to encourage the resident to wear the aid. Hearing aids are frequently mislaid, lost or broken. Thus, residents not using aids cannot readily access auditory stimuli required to communicate. Evidence on effective strategies to improve hearing-related communication in care homes is largely anecdotal,
with little evidence-base. Managing hearing loss in care homes is complex and it often co-exists with other problems such as dementia and changes in behaviour, all of which will affect staff attitudes and their approach to its management.

Realist synthesis is a theory-driven explanatory approach for evaluating health and social complex interventions. It draws on a range of different sources of data, thereby maximising the use of all available literature and resources. It is designed to address the questions of what works, how, why, to what extent, for whom and in what circumstances. Therefore, it uses a pragmatic approach to assess evidence, and seeks to explain why different outcomes can occur in different contexts. It has not previously been used in hearing loss research.

This ongoing study is undertaking a realist review of all forms of relevant information, including grey literature and relevant websites. The initial programme theory that is developed is considered by a ‘context expert’ group of practitioners, care home staff and the public who will review and refine the theory across 7 sessions across a 15 month period. The intended output will be (i) best practice guidelines in hearing management can occur in care homes, (ii) and the identification of research priorities with a focus on interventions, and importantly how these will be best measured.

Title: Assessing speech-communication performance: from intelligibility to comprehension
Poster number: 13
Author(s): ¹Lionel Fontan
Affiliation(s): ¹Archean Technologies, Division of Speech Analysis and Measurement Systems
Content: Speech-intelligibility tests are used in a variety of contexts to investigate the limitations imposed on speech-communication performance by: (i) human speakers (e.g. disordered speakers, second-language learners), (ii) human listeners (e.g. people experiencing hearing losses) and (iii) the transmission channel (e.g. for the evaluation of public address systems). Depending on the research question, the actual task will differ from: (i) reading out loud, (ii) over repeating to (iii) transmitting lists of language items (typically words) but in all cases, an intelligibility score is computed, corresponding to the percentage of speech units that were correctly identified. Unlike speech-intelligibility tests, speech-comprehension tests aim at quantifying the degree to which listeners are able to interpret the meaning of a spoken message. Speech comprehension may be measured through different tasks implying the correct understanding of a spoken message — e.g. answering to factual or inferential questions regarding a spoken text, associating pictures with sentences, or answering to oral commands by moving objects. Traditionally, it has been assumed that speech intelligibility and comprehension are positively and strongly related. However, several recent studies suggested that speech-intelligibility and speech comprehension tests may address different constructs, by showing that performing well in one task does not necessarily imply performing well
in the other (e.g. Smith & Nelson, 2008). The present study investigated the relationship between the intelligibility and comprehension of speech presented in babble noise. To this end forty participants listened to French imperative sentences (commands for moving virtual objects) in a multi-talker babble background for which intensity was experimentally controlled. Participants were instructed to transcribe what they heard and answer the commands in a software set up for this purpose (Fontan, 2012; Fontan, Gaillard & Woisard, 2013; Fontan, Tardieu, Gaillard, Woisard, & Ruiz, 2015). The former test provided intelligibility scores and the latter provided comprehension ones. Results reveal a globally weak correlation between intelligibility and comprehension scores ($r = .35$, $p < .001$), supporting the idea that the two tests may be thought as complementary.

References

Title: CarlW: an innovative tool for the objective assessment of human speech-processing performance

Poster number: 14

Author(s): Lionel Fontan

Affiliation(s): Archean Technologies, Division of Speech Analysis and Measurement Systems

Content: CarlW is a new system designed to assess hearing-aid (HA) performance in terms of gains in speech intelligibility and speech comprehension. CarlW implements the idea that Automatic Speech Recognition (ASR) can be used to replicate human speech-processing performance (Fontan et al., in press; Fontan et al., 2016; Fontan et al., 2015), and, thus, can potentially be used to fine-tune HA fitting. This principle, for which a European patent has been filed (Aumont & Wilhem-Jaureguiberry, 2009), is used to provide the audiologist/HA dispenser with fast, reliable and objective information on HA performances. This presentation focuses on the architecture, the way of functioning and the human-machine interface of the system, which consists of three main parts:?

1. A real-ear electronic device able to record speech stimuli inside the client/patient’s ear canal.
2. Software that simulates some of the perceptual consequences of hearing loss, such as elevated hearing thresholds, loudness recruitment and loss of frequency selectivity.
3. An ASR system. More precisely, CarlW is meant to work as follows. Speech samples (e.g. words, sentences) are recorded inside the patient/client’s ear canal, near the eardrum, both when wearing a HA and without a HA. The
recordings are processed in order to simulate the perceptual consequences of the hearing loss of the patient/client, based on his/her audiometric thresholds. The resulting audio files are then fed to the ASR system that tries to recognize the original speech stimuli, and the results are used to qualify the fitting of the HA through various scores (e.g. word error rate, phonological distances between stimuli and ASR results) and analyses (e.g. identification of underperforming frequency ranges).

References

Title: Development and evaluation of a new method for determining binaural sensitivity to temporal fine structure
Poster number: 43
Author(s): Dr Christian Füllgrabe1, Andrew J. Harland2, Dr Aleksander P. Sęk3, Professor Brian C.J. Moore2
Affiliation(s):
1Medical Research Council Institute of Hearing Research
2Institute of Acoustics, Adam Mickiewicz University
3University of Cambridge

Content: Speech identification in noise has been shown to be associated with a listener’s sensitivity to the temporal fine structure (TFS) of sounds. Both hearing loss and age adversely affect the ability to process TFS information. Hence, there has been interest in the development of tests that could be used in the clinic or in large-scale research studies to assess sensitivity to TFS. Hopkins and Moore (2010) developed a test of binaural TFS sensitivity that determines the detection threshold for an interaural phase difference (IPD) of a pure tone with a fixed low frequency (the TFS-LF test). However, many listeners cannot perform this test, so a graded measure of sensitivity to TFS is not obtained. To address this limitation, a new binaural test was developed, the TFS-AF (adaptive frequency) test, based on the observation that IPD discrimination is usually relatively good at low
frequencies but becomes impossible above a listener-specific frequency limit. Listeners are required to detect a fixed IPD in pure tones while the frequency is adaptively varied to determine the threshold. Normative data for a range of IPDs were obtained for young (>30 years) and older (>60 years) adult listeners with audiometrically normal hearing over the tested frequency range. All listeners were able to complete the TFS-AF test (even those who previously failed to perform the TFS-LF test) and there was no evidence for improved sensitivity following protracted practice. TFS-AF thresholds were constant for IPDs from 90º to 180º but declined markedly for smaller IPDs. Thresholds were moderately-to-strongly correlated with performance on the TFS-LF test. Mean IPD sensitivity was lower for the older than for the younger listeners. The TFS-AF test was also administered to older listeners with mild-to-moderate hearing loss for frequencies ≥1.5 kHz. All listeners yielded a graded measure of binaural TFS sensitivity and average sensitivity did not differ significantly from that of the older normal-hearing listeners. Finally, older listeners (N = 51, 47 and 20 for age groups 60-69 years, 70-79 years and 80+ years, respectively) with normal audiometric thresholds for frequencies ≥1.5 kHz and different degrees of hearing loss at higher frequencies were tested on the TFS-AF test using an IPD of 180º. Performance tended to worsen with increasing age, but less than 3% of the listeners could not perform the task. In conclusion, the TFS-AF test is suitable for the rapid assessment of TFS sensitivity in untrained listeners, independent of their age and hearing status, and age norms are available for the age range 60-90 years. Work supported by the MRC (grant number U135097130) and the Rosetrees Trust.

Title: Investigating the role of working memory in speech-in-noise identification
Poster number: 53
Author(s): Dr Christian Füllgrabe¹, Professor Stuart Rosen²
Affiliation(s):
¹Medical Research Council Institute of Hearing Research, Nottingham
²University College London

Content: With the advent of cognitive hearing science, increased attention has been given to individual differences in cognitive functioning and their explanatory power in accounting for inter-listener variability in understanding speech in noise (SiN). The psychological construct that has received most interest is working memory (WM), representing the ability to simultaneously store and process information. Common lore and theoretical models assume that WM-based processes subtend speech processing in adverse perceptual conditions, such as those associated with hearing loss and/or background noise. Empirical evidence confirms the association between WM capacity (WMC) and SiN identification in older hearing-impaired listeners. To assess whether WMC also plays a role when listeners without hearing loss process speech in adverse conditions, we surveyed
published and unpublished studies in which the Reading-Span test (a widely used measure of WMC) was administered in conjunction with a measure of SiN identification. The meta-analysis revealed little and inconsistent evidence for an association between WMC and SiN performance (Füllgrabe and Rosen, 2016). We also analyzed data from 132 normal-hearing participants sampled from across the adult lifespan (18 to 91 years), for a relationship between Reading-Span scores and identification of matrix sentences in noise. Performance on both tasks declined with age, and correlated moderately even after controlling for the effects of age and audibility. However, separate analyses for different age groups revealed that the correlation was only significant for middle-aged and older groups but not for the young participants (<40 years), illustrating the moderating effect of age on the relationship between WMC and SiN identification. A possible explanation for this increasing cognitive involvement with age is the accumulation of age-related deficits in supra-liminal auditory processing (e.g., sensitivity to temporal-fine-structure and temporal-envelope cues; Füllgrabe, 2013; Füllgrabe et al., 2015), resulting in under-defined and degraded internal representations of the speech signal, calling for WM-based compensatory mechanisms to aid speech identification. Füllgrabe, C. 2013. Age-dependent changes in temporal-fine-structure processing in the absence of peripheral hearing loss. Am J Audiol, 22, 313-315. Füllgrabe, C., Moore, B. C. & Stone, M. A. 2015. Age-group differences in speech identification despite matched audiometrically normal hearing: contributions from auditory temporal processing and cognition. Front Aging Neurosci, 6, 347. Füllgrabe, C. & Rosen, S. 2016. On the (un)importance of working memory in speech-in-noise processing for listeners with normal hearing thresholds. Front Psychol, 7, 1268.

Title: Parent views on the direction of future research about OME and hearing loss in children
Poster number: 15
Author(s): Dr Amanda Hall
Affiliation(s): 1 Aston University, Birmingham
Content: This study aimed to explore parent, patient and public views on the direction of future research about otitis media with effusion (OME) and hearing loss in typically developing children and children with Down syndrome (DS). An online survey was run for parents of children with OME to identify research topics and priorities relating to OME and hearing loss. Focus groups and interviews were also held with parents and carers of children with DS, young people with DS and charitable organisations representing people with DS. Parents and patients identify that future research should focus on improving decision support and information for managing newly diagnosed and on-going OME and hearing loss.
Title: An evaluation of service provision for managing otitis media with effusion and hearing loss in children with Down syndrome
Poster number: 16
Author(s): Dr Amanda Hall
Affiliation(s): 1 Aston University, Birmingham
Content: Glue ear or otitis media with effusion (OME) is one of the most common conditions of childhood. OME and its associated hearing loss is particularly prevalent in children with Down Syndrome (DS). This study aimed to evaluate current service provision across England regarding management of OME and hearing loss in children with DS. A telephone survey was conducted with 21 clinicians in England who had responsibility for hearing services for children with DS. Interviews were structured and covered the protocols for hearing surveillance, criteria for intervention for OME and hearing loss, types of interventions provided, outcome measures used, the level of multidisciplinary involvement and parent involvement in decision making in their service for children with DS. There is variation across clinical services in several key areas, including: the frequency of appointments offered to parents for assessing and monitoring their child’s hearing, in particular during pre-school years; approaches to managing conductive hearing loss identified by the newborn hearing screen; the provision of hearing aids in managing conductive hearing loss; access to ENT and grommets. There is a need to develop evidence based guidelines for managing OME and hearing loss in children with DS.

Title: To Implant or not to Implant?! That is the question!
Poster number: 17
Author(s): Nicola Hatton, Yu Chen
Affiliation(s): 1 Addenbrookes Hospital Cambridge University Trust
Content: Introduction Intraoperative testing was used to determine if cochlear implantation was suitable for a 1 year old child. The MRI scan indicated bilateral small internal auditory canals; the right had no visible vestibulocochlear nerve, the left had a questionable vestibulocochlear nerve. This is often a reason not to implant. However, audiological testing showed a consistent responses averaging 100dB HL across the speech frequencies in the left ear, demonstrating a degree of cochlear nerve function. Method A single use test electrode was inserted and used to electrically stimulate the cochlear to determine if this electrical stimulation would elicit an electrical auditory brainstem response. The test electrode, manufactured by Medel, had three electrode contacts, this was used to provide the electrical stimulus, and electrical Auditory Brainstem Responses (eABR) were recorded using a Viasys Synergy 5 evoked potential system. A standard cochlear implant
surgical approach was used to insert the test electrode and when inserted, telemetry measurements were made to ensure the test electrode was not damaged during the insertion. The eABR recordings were then attempted. Results The left ear gave eABR responses at the most apical electrodes, but no eABR responses were present on the right. Since eABR responses were present on the left, the decision was made to implant the left ear. As there were no eABR responses on the right it was decided not to proceed with cochlear implantation. Conclusion Cochlear implant assessment of this child showed conflicting results as the MRI suggested cochlear nerve aplasia, but behavioural Audiological tests showed reliable and consistent responses to sound in the left ear. Use of a test electrode at the time of surgery allowed confirmation of neural function, to decide whether or not to implant.

Title: The Hearing Handicap Inventory for the Elderly: A re-validation study using Rasch Analysis
Poster number: 54
Author(s): Dr Eithne Heffernan¹, Barbara Weinstein², Dr Melanie Ferguson¹
Affiliation(s):
¹National Institute for Health Research (NIHR) Nottingham Biomedical Research Centre and Otology and Hearing Group, Division of Clinical Neurosciences, School of Medicine, University of Nottingham
²City University of New York
Content: Background - The ‘Hearing Handicap Inventory for the Elderly’ (HHIE) is one of the most frequently used questionnaires in hearing research. It was developed in the United States in the 1980s as a means of assessing the emotional and social consequences of hearing loss. It was validated using traditional psychometric analysis, with several studies demonstrating that it has acceptable internal consistency, test-retest reliability, convergent validity, and responsiveness. However, the HHIE has not been validated using modern psychometric analysis, such as Rasch analysis or Item Response Theory. Modern psychometric analysis is increasingly recognised as being superior to traditional psychometric analysis in several respects. Consequently, it has been used to re-validate a number of hearing questionnaires, including the ‘Communication Profile for the Hearing Impaired’ and the ‘Amsterdam Inventory for Auditory Disability and Handicap’. The aim of this study was to use Rasch analysis to re-evaluate the HHIE in order to ensure that it has adequate psychometric properties by modern standards.
Method - Rasch analysis was performed on HHIE data collected from 277 adults with hearing loss. The psychometric properties of the response scale (e.g. threshold ordering) and the individual items (e.g. redundancy, fit to the Rasch model) were assessed. In addition, the psychometric properties of the questionnaire as a whole were assessed, including construct validity (e.g. fit to the Rasch model, unidimensionality) and reliability (e.g. person separation reliability). Results - The majority of the individual items in the HHIE had adequate psychometric properties. The response scale was found to be appropriate for use with all except one
item. The HHIE as a whole had high person separation reliability but displayed poor fit to the Rasch model and failed the test of unidimensionality. This suggests that it is not justifiable to calculate a total score for the HHIE by summing its items together. The deletion of four items improved the psychometric properties of the HHIE, including its fit to the Rasch model and its unidimensionality. Discussion - This study was, to the authors’ knowledge, the first application of modern psychometric analysis to the HHIE. The questionnaire displayed a range of strong psychometric properties, especially following the removal of four items. This research demonstrates the importance of using modern psychometric analysis to re-validate existing hearing questionnaires. In particular, this is the only form of psychometric analysis to permit a detailed assessment of each individual item and the response scale and to robustly test unidimensionality. Therefore, it is the only means of ensuring that hearing questionnaires have sufficient psychometric properties to be used as outcome measures in clinical trials and clinical practice.

Title: ‘Thinking Aloud’ to examine the usability, relevance and impact of a C2Hear mobile-enhanced multimedia video tailored to communication partners

Poster number: 12

Author(s): Dr Helen Henshaw¹ ², Dr David Maidment¹ ², Dr Alex Barker¹ ², Professor Heather Wharrad³, Dr Melanie Ferguson¹ ²

Affiliation(s):
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²University of Nottingham, Otology and Hearing Group, Division of Clinical Neuroscience, School of Medicine
³University of Nottingham, Health e-Learning and Media Group, Faculty of Medicine and Health
⁴Science, School of Medicine, Nottingham University Hospitals NHS Trust

Content: BackgroundC2Hear reusable learning objects (RLOs) are a series of 10 short multimedia videos, developed with and for people with hearing loss (PHL), addressing practical and psychosocial issues around hearing aid (HA) use and communication. The RLOs, which have been shown to provide multiple benefits to PHL in a randomised controlled trial of 203 new hearing aid users, are freely available via YouTube (www.youtube.com/C2HearOnline). One RLO (Communication Tactics) has been further developed as a mobile-enhanced RLO (mRLO) targeted to friends and family of PHL and the general public, with input from HA users and their communication partners (CPs). The C2Hear mRLO incorporates embedded interactivities to promote learning. MethodsA Think Aloud evaluation explored the benefits to CPs of having information tailored to them as well as the usability and impact of the enhanced mRLO. Think Aloud is a qualitative methodology where participants ‘think out loud’ while working on a task. Using concurrent and retrospective Think Aloud
techniques this research examined a) usability of the mRLO by CPs, both alone, and working together with PHL, and b) usability and impact of the enhanced mRLO, compared with the original, in 9 PHL and CP dyads. All participants rated the quality of the mRLO using the user version of the Mobile Application Rating Scale (uMARS).

Results To date (April 2017), data have been collected from 7 PHL/CP couples (CPs: 1 male, 6 female, aged 30-80 years (mean=64.9 years), and PHL: 6 males, 1 female, aged 68-81 years (mean=71.6 years) with a better-ear PTA of 46.9dB HL (range=21-78dB HL).

Main themes from preliminary TA analyses show: 1. Usability is high in both individual and joint working conditions, 2. mRLO content is aligned to CPs and PHLs own experiences, 3. the mRLO increased CPs knowledge of hearing loss, hearing aids and communication, 4. the mRLO prompted novel discussions between couples about communication difficulties (“I never realised [communication in that situation] was a problem for you...”), and 5. CPs would change their behaviour based on learning from the mRLO (“from now on I will choose a [restaurant] table with good lighting”). Participants rated the quality of the mRLO as high (CP mean uMARS score=3.81, PHL=3.93).

Discussion Both PHL and CPs preferred the embedded interactivities and modular presentation of the enhanced mRLO over the original and rated the materials high-quality. PHL found the mRLO useful in highlighting their own communication challenges to CPs. In the context of joint working, the mRLO resulted in novel discussions between CPs and PHL about communication in challenging situations and prompted CPs to change their behaviour to help improve communication.

Acknowledgments This is a summary of independent research funded by the National Institute for Health Research (NIHR).

Title: A systematic review and narrative synthesis of the measurement properties of patient-reported outcome measures (PROMs) used to assess listening effort in hearing loss

Poster number: 18

Author(s): Sarah Hughes

Affiliation(s):

1 South Wales Cochlear Implant Programme
2 Swansea University Medical School

Content: Introduction: Listening effort (LE) is defined as a specific form of mental effort associated with listening. Despite appropriate amplification of the auditory signal through hearing aids and/or cochlear implants, individuals with HL continue to find listening effortful with consequences for their quality of life. LE is not assessed routinely in the audiology clinic and the quality and availability of validated, self-reported questionnaires (i.e., PROMs), to measure LE have not been confirmed. This systematic review (PROSPERO registration number: CRD42016048808) aimed to identify PROMs (generic or condition-specific) used to measure self-reported LE in HL and to collate independent evidence from primary studies describing the development and validation of these measures.
Specific objectives were:• Assess the methodological quality of the studies included in the review. • Assess the quality of the identified PROMs’ measurement properties. • Determine the credibility of the evidence regarding the quality of the identified PROMs.

Methods: We reviewed primary studies of any design that were full-text, original articles in English reporting on any aspect of the development and/or psychometric validation of a PROM used to measure LE in individuals with any degree of HL. Studies utilising a PROM as an outcome (with no evaluation of its measurement properties) or reporting on the development and validation of instruments designed for completion by a proxy (e.g., clinician-reported outcome measures) were excluded. Articles in languages other than English were excluded due to lack of resources. The databases Medline, EMBASE, CINAHL, PsychInfo, and Web of Science were searched from inception until 13/11/2016. Further studies were identified by hand-searching the reference lists of included studies, the contents pages of key journals and conference abstracts from January 2010 to November 2016. Two reviewers independently completed title, abstract, and full-text screening to determine study eligibility. Study quality was assessed using the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN). The quality of included PROMs and the credibility of the evidence was assessed and summarised in a narrative synthesis.

Results: Of the 1180 retrieved studies, 29 studies reported on the measurement properties of 15 PROMs. With one exception, the PROMs assessed LE at item or factor level. Early findings show that of the 7 articles assessed to date for methodological quality, none achieved a rating of “good” or “excellent” in all of the COSMIN criteria. None were descriptive enough to complete the full COSMIN checklist. This review is on-going until May 2017.

Discussion: This systematic review will provide a comprehensive evaluation of PROMs currently available to assess self-reported listening effort in hearing loss. These findings will enable researchers and clinicians to understand the quality of existing measures and confirm the need for a new PROM of listening effort.

Title: Interdisciplinary Professional Learning between Audiology and Pharmacy Students: A Review of Content Development

Poster number: 19

Author(s): Saira Hussain¹, Jamie Miks¹, Emma Wilson¹

Affiliation(s): ¹Aston University

Content: Background: Provision of healthcare requires its clinicians to work in and across multi-disciplinary teams for the best patient outcomes. Employers consider the importance of teamwork critical and this has been translated into higher education through teamwork pedagogical teaching approaches, focusing on communication skills, interactivity and collaboration (Riebe et al., 2016). To provide an example of such interdisciplinary working, second year undergraduate audiology students and fourth year pharmacy students at Aston University took part in a one day structured
teaching and learning event with the opportunity to experience and learn from each other’s fields. 
Aim: To introduce the concept of interdisciplinary learning to Audiology undergraduate 
students.
Session: The overall aim of the session was to increase knowledge across groups and to 
facilitate discussions between professions in order to achieve a holistic view over patient care. A half 
day session was held with 28 audiology and 60 pharmacy students (across three sessions). In 
previous years, audiology students were asked to demonstrate and perform audiological 
procedures, resulting in a one-way form, of sharing. For these new session, there were four main 
components to the day: discussing and demonstrating otoscopy and unmasked PTA, a group 
matching task to discuss common medications in audiology/ENT, practice taking patient histories 
and finally working in groups on patient case studies with short class presentations. These case 
 studies were redesigned to include pharmacological medications relevant to the patient’s history or 
condition. Informal Feedback from students was obtained at the end of the session. Discussion: 
These sessions enabled the students to; have an awareness of the different healthcare courses; 
demonstrate and practice procedures, and discuss shared decision making in order to provide the 
best patient outcome. Further opportunities to expand these are currently being explored, and hope 
to include students from other healthcare professions. Formal evaluation will be implemented in the 
future.

Title: Auditory Neuropathy Spectrum Disorder (ANSD) – Audiological Assessment Audit(Birth Cohort 
October 2005 – October 2014)
Poster number: 21
Author(s): Stefan Kelf¹, Sally Wood²

Affiliation(s):
¹University Hospitals of Leicester NHS Trust
²NHS Screening Programmes, UK

Content: Introduction
ANSD is a term used to describe a pathology/ pathologies of hearing that 
present with the following pattern of audiological test results: • ABR absent or with severely 
abnormal morphology at high stimulus levels + OAEs and/or CM present. Aims1. Examine prevalence 
of the condition in the referred population in UHL and compare these estimates with those reported 
nationally and internationally2. Review outcome of behavioural assessments to determine the 
distribution of true thresholds of hearing in the affected ears3. Present data from re-assessment to 
determine prevalence of maturationMethod• Retrospective data collection• Data sources: 
Northgate eSP NHSP screening national database• Historical hearing test results analysed.
Results 29 babies identified with ANSD in one or both ears. Discussion• Findings agree with the literature that 
ANSD presents in about 10% of children with bilateral permanent hearing loss. We found ANSD was 
also present in 19% of unilateral cases also. The overall prevalence (unilaterals and bilaterals) was
13%. ANSD was identified on more occasions from within our well baby screen referrals (17 cases) than from the higher risk NICU group (12 cases). However, when looking at the total number of referrals as a whole, the risk for ANSD was still more than double for NICU babies (1 per 149 well baby referrals compared to 1 per 57 NICU referrals). Mean behavioural threshold was found to be 73dBeHL (range 25-128dBeHL). It was found that, as previously suggested in the literature, it is possible for ANSD to resolve and recover over time.

Title: Auditory Neuropathy Spectrum Disorder (ANSD) – A Service Provision Audit Birth Cohort
October 2005 – October 2014
Poster number: 22
Author(s): Stefan Kelf, Sally Wood

Affiliation(s):
1 University Hospitals of Leicester NHS Trust
2 NHS Screening Programmes, UK

Content: Introduction
It was noticed we were possibly getting more babies with confirmed ANSD than was suggested in the literature. Was this because we were not discharging on OAEs like many services? Aims:

- Examine ANSD prevalence in referred population and compare with reported
- Review local assessment procedures against national guidelines, identify and rectify any shortcomings and thereby improve service provision

Method: Retrospective data collection
Data sources: Northgate eSP NHSP screening database
Historical hearing test results analysed.

Results

- 29 babies identified with ANSD in one/both ears.
- 3 not offered the 8-10 week and 7 not offered 12-18 month repeat for maturation as recommended in NHSP guidelines. 4 did not receive the full requirement of recommended tests to confirm ANSD.
- 90% confirmed by 12 months of age
- 28 of 29 received referral to Hearing Support Services at appropriate time.
- 25 of 29 babies offered medical referral at appropriate time.

Discussion
Findings agree with the literature that ANSD presents in about 10% of children with bilateral PCHI. We found ANSD present in 19% of unilateral cases also. Overall prevalence (unilaterals and bilaterals) was 13%.

Conclusion/Action Plan

- Prevalence in line with estimates reported
- Checklist developed for clinical use which documents the full requirement of tests, when these are needed and allows on-going recording of which have been carried out and which still need completing.
- To prevent delayed/missed assessments a new care pathway document developed for use by all services involved with the child. This clearly outlines whose responsibilities it is and when they should be offering, referring for and carrying out (re-)assessments.

Title: Incidence of Permanent Childhood Hearing Impairment (PCHI) in the First Year of Life in the Bristol Area: Ethnicity and Socioeconomic Status.

Poster number: 23

Author(s): Vicki Kemp¹, Dr Amanda Hall¹, Dr Rachel Humphris¹

Affiliation(s): ¹ University Hospitals Bristol NHS Foundation Trust, Bristol

Content: Objectives: To investigate the incidence of permanent childhood hearing impairment (PCHI) diagnosed within the first year of life in the Bristol, North Somerset and South Gloucestershire area (BNSSG), and associations with ethnicity and socioeconomic status (SES) on the incidence of PCHI. Design: Retrospective study of all babies born in the BNSSG area between April 2006 and March 2014; data was extracted from the eScreener Plus (eSP) database. Results: Incidence of bilateral congenital PCHI was calculated at 1.19 cases per 1,000 live births. Relative risk of PCHI in the Asian population was more than twice that of the White population at 2.16 (p=0.0015). Incidence of PCHI was highest in the most deprived quintile. Conclusions: In keeping with other areas of the UK, incidence of PCHI in BNSSG is higher in the Asian population than in the White population. The association of PCHI with deprivation may reflect the higher number of ethnic minorities resident in these areas. These findings have implications for the delivery of paediatric audiology services that meet the needs of the local population.

Title: Clinically relevant long-term reliability of contralateral suppression of click-evoked otoacoustic emissions
Clinically relevant long-term reliability of contralateral suppression of click-evoked otoacoustic emissions (CEOAEs) are a potentially useful clinical tool. Recent studies have provided descriptions of the reliability of contralateral suppression of CEOAEs, indicating good to excellent reliability. However, these were limited in terms of their clinical relevance as they utilised custom-built measurement systems or were conducted by a single tester over a short time period. Further, previous studies typically report only group data. The present study addresses these limitations by reporting individual and group data collected by two testers, using standard clinical equipment over longer time periods. Contralateral suppression of CEOAEs was recorded from 12 ears using the ILO 292 system. Clicks and contralateral broadband noise (BBN) were presented at 60 dB p.e. SPL and 65 dB SPL respectively. Global and best ½-octave band suppression values (in dB) were measured on four separate occasions by two testers spanning an average time period of 35.5 days. Reliability was assessed using the intraclass correlation coefficient (ICC) and the standard error of measurement (SEM). Multilevel regression analysis was used to explore potential causes of variation in suppression (e.g. tester, middle ear status, stimulus properties). Global suppression reliability was shown to be worse than previous reports, with only fair to good reliability observed. ICC and SEM values were 0.57 and 0.47 dB respectively. Corresponding values for best ½-octave band suppression were 0.49 and 0.64 dB. Further analysis revealed no significant effect on contralateral suppression for a range of variables tested. Substantial variation (up to 2 dB) in contralateral suppression between test sessions was seen for individual subjects. Findings suggest that contralateral suppression of CEOAEs, measured by separate testers using standard clinical equipment, is not reliable over long time periods.
A number of self-report questionnaires have been developed to measure cochlear implant (CI) users hearing ability in real-world settings. For children, a modified version of the Speech, Spatial and Qualities of Hearing Scale (SSQ) is used to assess a child’s hearing ability via reports from parents (i.e. the SSQ-P). The SSQ-P consists of 23 items which assess various aspects of speech perception, sound localisation and identification and has been used within a range of clinical and research settings. However, clinical experience suggests that the length and complexity of the SSQ-P makes it overly time-consuming to complete, resulting in inaccurate or incomplete assessment of the child’s hearing ability. The aim of this study, therefore, was to develop a short form of the SSQ-P using statistical analyses of previously collected clinical data. Completed SSQ-P questionnaires were analysed for 66 cochlear-implanted children. Explanatory factor analysis (EFA) was used to identify latent traits within the data and confirmatory factor analysis (CFA) was used to confirm which trait each of the 23 items measured. Each item was then analysed using item response theory (IRT). Via statistical modelling, this assesses which items provide good levels of discrimination within each latent trait. EFA identified three latent traits (speech, spatial hearing and qualities of hearing) within the data. CFA confirmed latent traits were measured by their corresponding items, with the exception of one speech-related item which was more closely aligned to spatial hearing. IRT analysis excluded 13 items, so that the resultant short form version of the SSQ-P comprised of 10 items, with speech, spatial hearing and qualities of hearing assessed by 4, 3 and 3 items respectively. This shortened version, the SSQ-P10, is suitable for use in clinical settings with parents of children who use cochlear implants. Validation of this questionnaire, prior to recommending its widespread clinical use, is required.

Title: One versus Two Epley Manoeuvres in a Single Treatment Session: Are Two Epleys more Effective to treat Benign Paroxysmal Positional Vertigo (BPPV)?

Poster number: 26

Author(s): Karen Lindley¹, Clare Munro¹, Roger Esson¹, Ann Penny¹, Iram Zaman¹, Michael Howell¹, Liz Quibell¹

Affiliation(s): ¹University Hospital Birmingham NHS Foundation Trust, Edgbaston, Birmingham

Content: Background: The balance team see many patients diagnosed with BPPV and provide single treatment manoeuvres routinely. The patient is reviewed either by telephone or face to face and if necessary a second treatment is given. A review of the literature reveals the success rate for single treatments of BPPV is between 78 -90 % (Herdman et al, 1993, Fung et al, 1996). To ensure we were delivering an effective service for treating BPPV using the Epley manoeuvre (Epley, 1992)
we analysed data from patients referred for vestibular testing at the Queen Elizabeth Hospital Audiology Centre and compared it to the success criteria given in the literature. Reinink et al, (2014) raised the question of whether performing multiple Epley manoeuvres in a single treatment session would increase the success rate for treatment of posterior canal BPPV. Hypothesis: Performing two Epley manoeuvre treatments in one session would increase the success rate for treatment of posterior canal BPPV reducing the number of patient clinic visits.

Method: In 2013 a retrospective audit was undertaken of 98 patients treated in the years 2011 and 2012 to examine our success rate for treating unilateral posterior canal BPPV with a single Epley manoeuvre. In July 2014 we changed our clinical practice when treating unilateral posterior canal BPPV. We treated the affected side with an Epley and then in the same session repeated the Epley a second time for every patient. One week later each patient received either a telephone review or a face to face appointment and re-treatment given if appropriate. A total of 95 patients had been audited at the end of Jan 2017.

Results: Analysis of the 2011/12 data revealed our success rate to be 79.5% with one Epley manoeuvre. Analysis of the two Epley manoeuvre treatments per session revealed a 76.8% success rate.

Conclusion: Based on these findings there is no advantage in performing two Epley manoeuvres in a single session to treat unilateral posterior canal BPPV.


Title: Counselling as more than information giving: How active listening, use of language and co-production can inform individualised auditory rehabilitation plans for adult cochlear implant recipients.

Poster number: 27

Author(s): ¹Carol Llewellyn, ¹Sarah Hughes

Affiliation(s): ¹ Abertawe Bro Morgannwg University Local Health Board, Bridgend, South Wales

Content: OverviewCounselling is more than information giving. It is a constellation of skills and techniques, which can play an important role when building the therapeutic relationship in audiology and cochlear implant (CI) clinics. Active listening enables audiologists and hearing rehabilitationists to gain an understanding of how a client’s hearing impacts on their quality of life.
Also, the language professionals use, whether written or oral, affects how information is received and understood. The use of positive language can improve communication and reduce defensiveness. Counselling facilitates co-production, an outcomes-focussed approach to healthcare whereby the patient and professionals work together as equals to achieve outcomes that matter to the individual.

Aim

A quality improvement initiative was undertaken in a Welsh CI centre to develop a co-production-based outcomes tool (OT) that, together with the use of counselling conversations, would 1) allow patients to use their own words when exploring possible outcomes from cochlear implantation and 2) document changes after CI that were of specific importance to the patient.

Method

The new OT was developed by the CI rehabilitation team to align with NHS Wales initiatives of co-production and prudent healthcare. Prior to surgery, adult CI candidates (N=7) were asked to describe in their own words what they would like to be different after cochlear implantation and to rate using a visual analogue scale (VAS) 1) how important this was; 2) how motivated they were to achieve this as well as 3) to describe how they might achieve their goals. Patients were able to nominate as many goals as wanted. These individualised goals were recorded using the new OT and reviewed with each patient three months after switch-on of their CI. Discussions arising from the OT informed the rehabilitation process for these patients. To evaluate the clinical utility of the new OT, the completed forms were analysed for common themes using principles of thematic analysis. Descriptive statistics were used to examine changes in patients’ motivation, importance and confidence for their specific goals. Clinicians provided feedback on the ease of use and OT design.

Results

The findings will be reported in this poster. Briefly, there were a number of similar themes; as well as a diversity of outcomes. Patients scored achievability and motivation thoughtfully and were ready to discuss these scores in depth. Importance was not consistent from pre CI to post switch-on. Motivation, however, was consistently high. Conclusion. Not all patients were comfortable with the co-production style of the OT. Changes were noticeable in what was achieved as well as patients’ perceived importance of their goals. The OT allowed patients to think outside the more traditional outcome measures. The OT encouraged a more collaborative post-implantation auditory rehabilitation. Results will inform future iterations of the OT.

Title: Evaluating the effectiveness of alternative listening devices to conventional hearing aids.

Poster number: 55

Author(s): Dr David Maidment¹, Dr Melanie Ferguson¹

Affiliation(s): National Institute for Health Research (NIHR) Nottingham Biomedical Research Centre and Nottingham University Hospitals NHS Trust ¹

Content: Advances in technology have led to a rapid increase in innovative alternative listening devices to conventional hearing aids. These alternatives include listening devices that can be linked to smartphones or tablet computers, allowing the users to conveniently fit and/or adjust their device
settings to their preferred sound levels at a time that suits the user. Alternative listening devices subsequently require limited or no audiological input in terms of fitting and fine-tuning, and could potentially lead to new healthcare delivery models. Despite their growing popularity, a high-quality evidence base (i.e. randomised controlled trials) assessing the clinical and cost effectiveness of alternative listening devices is currently lacking. To begin and address this, we are undertaking a body of work in accordance with the Medical Research Council’s guidelines for evaluating complex healthcare interventions. The guidelines strongly advocate conducting a systematic review, followed by a feasibility study, to address any uncertainties and to ensure that an intervention operates as intended. This work is necessary to inform the robust design of a full-scale efficacy trial. In the first registered systematic review assessing the effectiveness of alternative listening devices to conventional hearing aids, we showed that alternatives improved outcomes relative to unaided and hearing aid conditions. However, the existing evidence-base in this area was judged to be of poor quality and subject to bias, leading us to conclude that the magnitude of benefit conferred by alternatives remains uncertain. Furthermore, no included studies evaluated devices that could be paired to Smartphone technologies. Following on from this review, we have adopted a mixed-methods approach to assess the perspectives of adults with hearing loss toward four alternative listening devices: (i) made-for-Smartphone hearing aid; (ii) personal sound amplification product; (iii) Smartphone app; and (iv) hearable. Each individual (N=20) used one device in the ‘real world’ for a period of two weeks. Overall, people with hearing loss expressed positive opinions in terms of usability, delivery, accessibility, acceptability and adherence of alternative listening devices. These results have also been supplemented by focus groups involving NHS audiologists (N=6). In general, audiologists were aware of the benefits that alternatives could provide in terms of self-management, but were mindful that devices need to be supplemented with additional rehabilitation and support. This previous preliminary work lays the foundation for the next stages of our research; a feasibility study leading to a clinical trial that will evaluate the effectiveness of alternative listening devices compared to conventional hearing aids. The long-term goal is to make it easier for patients to manage their hearing loss by providing them with more evidence-based options to suit their needs. This may increase the likelihood that people will successfully manage their hearing loss, improving their quality of life.

Title: Exploring attitudes to hearing aids amongst patients in hospital and the impact of hearing loss on patient experience

Poster number: 44

Author(s): Resham Matharu

Affiliation(s): University Hospitals Coventry and Warwickshire NHS Trust
Content: This project has been designed to explore how many patients with hearing loss in hospital actually wear hearing aids and the effect of hearing loss on patients' experience in hospital. It takes the form of a qualitative questionnaire targeted at patients with hearing loss and asks them key questions regarding whether they have been told that they have a clinical need to wear hearing aids, whether they wear them and the reasons if not. It then goes on to ask about how hearing loss impacts patients' ability to engage in the management of their health care and whether health care professionals are receptive and take appropriate measures to cater for patients with hearing loss. This data has been compiled together and analysed to provide an insight into what it is like for patients with hearing loss in hospital.

Title: The views of UK audiologists on cognitive assessment in audiology

Poster number: 28

Author(s): Rebecca Millman¹, Douglas Beck², Sarah Bent³, Siobhàn Brennan⁴, Christian Füllgrabe⁵, Helen Henshaw⁶, Alissa Moakes⁷ and Piers Dawes¹

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Content: Age-related hearing loss is highly comorbid with cognitive impairment and dementia. Assessment of cognition within audiology clinics may be important in terms of facilitating early detection of dementia and effective individualised hearing rehabilitation (e.g. by informing selection of hearing aid technology, or indicating a need for extra support). The British Society of Audiology (BSA) Special Interest Group (SIG) on Cognition in Hearing recently surveyed members of the BSA (N=37) on their attitudes towards carrying out cognitive screening for dementia/cognitive impairment in audiology clinics. The results of our survey showed that the majority of respondents were supportive of cognitive screening in audiological assessment and management: 92% of respondents agreed that 1) cognitive assessment carried out in the audiology clinic would be useful in informing hearing rehabilitation and management options and 2) clinical guidelines on assessing and using information about cognitive function in audiological settings would be useful to support clinical practice. Respondents had some reservations about conducting and using cognitive screening in clinic. These reservations included 1) how to use information about cognition in audiological management (58% of respondents), 2) how to refer patients who fail a cognitive screening test (60%
of respondents) and 3) a lack of training on the use and interpretation of cognitive screening tests (76% of respondents). The results of this survey suggest that there is a need for i) research evidence on how cognitive factors could inform audiological management, ii) development of appropriate care pathways, iii) training and clinical guidelines on cognitive assessment in audiology.

Title: What do adults with mild and moderate hearing loss tell us about their experience of hearing loss?

Poster number: 56

Author(s): Rosemary Monk1, Eithne Heffernan2, Alex Barker2, Melanie Ferguson2

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1Aston University
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Content: Introduction: It has long been known that there are weak relationships between pure-tone audiometric thresholds and self-report of activity limitations and participation restrictions (formerly known as hearing disability and handicap). Identifying the key difficulties for people with mild and moderate hearing loss is essential for providing appropriate patient-centred management, particularly in light of recent commissioning decisions and NHS funding pressures. Qualitative methodologies provide insights into what matters to the individual and are increasingly being used in healthcare to investigate the patient experience. The aim of this research was to explore the lived experiences of people with mild and moderate hearing loss. Methods: Semi-structured interviews were collected from 12 adults with mild hearing impairment and 12 adults with moderate hearing impairment (1). The majority of participants were hearing aid users. Thematic analysis was applied to the interview data to identify key themes for mild hearing loss and key themes for moderate hearing loss. Results: Participants described a wide variety of experiences with regard to diagnosis and management of the hearing loss, their communication difficulties and the impact of their hearing loss on their relationships, social activities, work life and emotions. Acceptance of the hearing loss was a significant hurdle for many participants, and the association between hearing loss onset and deterioration in health and function due to ageing caused many to view their diagnosis in a negative light. When engaging with formal intervention and choosing personal coping strategies participants often made daily decisions about hearing loss management by evaluating the expected benefit compared to personal cost, in terms of effort or consequences. This impacted on hearing aid use and social engagement for some participants. Increased effort was needed for communication, engagement in social activities or work, whether participants used hearing aids or not, and there was a general recognition of the effort required from others to support communication with participants in social and work situations. Participants engaged with a range of communication
strategies, but found that these could be misinterpreted by others because their behaviour did not comply with social norms. Discussion: Findings will be related to the existing evidence in the literature, and similarities and differences between the two groups (mild, moderate hearing loss) will be presented. Insights provided by the data into the impact of hearing loss on the everyday lives of people with mild and moderate hearing loss will be discussed. This research has implications for current clinical practice. (1) Heffernan E, Coulson N, Henshaw H, Barry J, Ferguson M. (2016). International Journal of Audiology; 55: S3-12. This research was funded by the National Institute for Health Research.

Title: Are the BKB scores different when tested with male and female voices: Results from Adult Cochlear Implant Candidates
Poster number: 31
Author(s): Joanne Muff¹, Bettina Berknov², Frances Harris¹, Debi Vickers²
Affiliation(s):
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Content: Introduction: Current NICE criteria stipulate that adults hearing levels must be at least 90 dB HL at 2 and 4 kHz in their better ear, and with optimally fitted hearing aids they must score less than 50% on BKB testing. The NICE criteria do not stipulate that the sentences be presented using the male or female voice, although both are available on the currently used software. However it has been traditional for the male voice to be used and quoted when completing clinical reports. The aim of this study was to investigate a difference between the male and female voices, when administered to CI candidates. In addition, this data was compared with a group of normal hearing (NH) listeners.

Method: BKB speech reception scores from 100 cochlear implant (CI) candidates referred for CI assessment at The Emmeline Centre for Hearing Implants (EC) between 2013 and 2015 were collated. 78 candidates had test scores for both conditions with male and female voices. A control group, consisting of 25 fluent English speaking normally hearing adults also participated in this study. The control group were presented the BKB in speech-spectrum-shaped noise to measure speech-reception-thresholds (SRTs) in decibel (dBA). The control group was also tested with the BKB in quiet initially but the results were excluded from this study as all participants generated high scores typically around 100%. Results: In the CI group, average keyword scores for the BKB were superior for the male voice presentation. The average pre-operative recognition with a male voice ranged from 0-100% with a mean (SD) of 53.09% (28.06). The average speech recognition score for the female voice ranged from 0-100% with a mean (SD) of 39.86% (29.83). The CI candidates performed on average, 13% better when tested with a male voice than a female voice with the BKB in quiet, a difference which was found to be highly significant (p < .001). The normal hearing adults
when tested and re-tested had lower speech-reception-thresholds (dB) for the male voice than the female voice on the BKB in-noise, a difference which again was highly significant, p<.001.

Discussion
The results show that cochlear implant candidates are more likely to score below the 50% criterion point with a female test voice and successfully meet the NICE guidelines. These individuals went on to do well with their cochlear implants suggesting that the using the male voice is disadvantageous. A review of NICE guidelines is needed because 13% of candidates who benefitted from receiving an implant would have been discharged if the male BKB criterion level was used. Additional research is needed to further support this study’s significant results and raise awareness of CI and the economical benefits it provides.

Title: Choosing not to proceed with a bone conduction hearing implant (BCHI): understanding the perspectives of patients and professionals in order to improve services

Poster number: 67

Author(s): Zheng Yen Ng¹, Sarah Allen¹, Imran Mulla¹, Sue Archbold¹, Melanie Gregory¹, Sheetal Athalye¹

Affiliation(s): ¹The Ear Foundation, 83 Sherwin Road, NG7 2FB, Nottingham, UK

Content: Financial disclaimer: This study is supported by the Oticon Foundation Objectives: • To explore the uptake of BCHIs amongst UK adults and the reasons for not proceeding • To provide recommendations for services to inform and improve hearing care Study design: Mixed methods (quantitative + qualitative) Participants: Adults who have considered BCHIs (n=115) and professionals working in BCHI centres (n=20, representing 802 patients). Methods: Data were collected through the UK National BCHI Registry, an on-line survey of BCHI professionals, and an on-line survey plus semi-structured qualitative interviews of adults who had considered BCHIs. Results: For many adults, choosing a BCHI resulted in benefits to hearing and confidence in daily life. However, findings showed that 38% of clinically suitable candidates decided not to proceed with BCHI, instead choosing to optimise existing or use other hearing technology and reporting concerns around surgery, care and maintenance of the device and cosmetic reasons. Decision-making was affected by a lack of information and opportunity to find out more about BCHIs from other users. Adults who did proceed with BCHIs indicated that key to their decision-making was the variety of sources providing good quality information, time for discussion, opportunity to experience BCHIs through a trial and speaking to BCHI users. They also encouraged candidates to have realistic expectations post-implantation. Conclusion: BCHIs have the potential to make a significant, positive impact on the life of a person with hearing loss, yet many are choosing not to proceed. Professionals need to be well-informed and up-to-date in order to provide consistent counselling and advice to patients. Patients need continued discussion with professionals and access to a variety of good quality information sources, including more opportunity for hands-on experience & contact with
other BCHI users. Making these changes to the vital decision-making process may encourage greater numbers in the uptake of BCHIs.

Title: Practice Patterns of South African Audiologists in Cerumen Management

Poster number: 45

Author(s): Dr Chad Mukovhe Phanguphangu¹

Affiliation(s): ¹University of Cape Town

Content: Background: Although previously falling within the scope of practice of Otorhinolaryngologists and Medical Officers, cerumen management now falls within the scope of practice of Audiologists in South Africa. Objective: To determine the theoretical and practical training, practical experience, competence and practice patterns of South African Audiologists regarding cerumen management. Methods: A descriptive prospective cross-sectional survey utilizing a questionnaire for data collection. A questionnaire adapted from Johnson et al (2013) was developed by the researcher and posted online on surveymonkey.com to be completed by South African Audiologists between July and September 2016. The questionnaire addressed sections on educational training, experience and practice patterns of South African Audiologists regarding cerumen management. Descriptive statistics in the form of percentages and frequency tables were used to analyze the data. Additionally, a built-in data analysis package on surveymonkey.com was also utilized for data analysis. Study sample: Three hundred and fifty-six South African Audiologists currently in practice. Results: Majority of participants (85%) indicated that they had been working for less than 10 years. Forty-nine participants reported that they received less than 10 hours of theoretical training while 57% received less than 10 hours in clinical education. Majority of the participants (61%) were employed in the public sector while 36% was practising in the private sector which comprised academia, private practice and research. A significant 91% of the participants reported they felt competent to perform cerumen management, with 96% preferring manual removal, aural irrigation or a combination of the two. Three percent of the sample reported that they preferred suctioning. Handwashing before and after the procedure was the preferred method of infection prevention and control in 87% of the participants. A further 66% indicated they only wore gloves. Additionally, a further 27% reported that they in addition to wearing gloves, they also wore facemasks and goggles to prevent spread of infection. A significant 85% of the participants indicated that they always explained the procedure as well as any possible complications of cerumen management to their patients. Ninety percent of the participants reported that they always performed an otoscopic examination after performing the procedure. Only 5% of the participants reported having experienced adverse events following cerumen management with patients needing additional medical intervention. Conclusion: South African Audiologists feel that they are competent and adequately trained to perform cerumen management against the set international standards. In
comparison to a study assessing their American counterparts regarding cerumen management, South African Audiologists reported to be performing better. This study highlights a need for continuous medical education sessions regarding informed consent for audiologists in cerumen management as a significant 15% (n=53) reported that they hardly, if ever, explain the procedure, its possible complications as well as obtained informed consent from their patients.

Title: High Prevalence of Kanamycin-Induced Ototoxicity in Paediatric Patients Treated for Drug-Resistant Tuberculosis in Gauteng, South Africa
Poster number: 46
Author(s): Dr Chad Mukovhe Phanguphangu
Affiliation(s): 1University of Cape Town

Content: Author: Mukovhe Phanguphangu, MSc Audiology
Affiliations: Faculty of Health Sciences, University of Cape Town, South Africa
Background: Kanamycin, administered as part of the second line regimen for Drug-Resistant Tuberculosis (DR-TB) for its high cure rate, is associated with high incidence of ototoxicity. Objectives: This study was conducted to determine the incidence of kanamycin induced ototoxicity and describe the hearing loss and other associated auditory deficits observed in DR-TB paediatric patients treated with Kanamycin. Methods: A prospective descriptive cross-sectional study was undertaken utilizing conventional as well as extended high frequency audiometry; to determine the type, laterality and degree of hearing loss and the presence of ototoxic hearing loss. The Tinnitus Handicap Inventory was utilized to determine the presence and type of tinnitus. Other associated auditory deficits were also noted during case history taking and otoscopic examinations. Descriptive statistics in the form of percentages and frequency tables were used to analyze the data and obtain a quantitative analysis of the prevalence of ototoxicity. Study Sample: Fifty paediatric patients aged between 5 years and 17 years who underwent Kanamycin treatment for DR-TB between January 2015 and December 2016. Results: A total of 50 participants successfully underwent Kanamycin treatment for DR-TB in Carletonville Hospital, South Africa, and had their hearing monitored for any signs of ototoxicity at the West Rand District Health Services, Merafong Sub-District Audiology unit. Twenty-nine participants were female and twenty-one were male. Thirteen percent of the participants had normal hearing and did not develop any signs of ototoxicity. Majority of the participants (86%) presented with high frequency tinnitus while forty-eight complained of otalgia. Chronic suppurative otitis media was observed in 12% of the participants. Eighty percent of participants developed various types of hearing loss during treatment, with 74% presenting with bilateral severe to profound sensorineural hearing loss, 2% presenting with mild to moderate conductive hearing loss and 4% with a mixed hearing loss. Seven percent of the participants developed delayed onset of moderate to severe sensorineural hearing loss post cessation of treatment, which was diagnosed at 6 weeks post cessation of treatment scheduled.
screening. Overall ototoxicity was diagnosed in 93% of the participants using case history, conventional pure tone audiometry, extended high frequency audiometry and the tinnitus handicap inventory. Conclusion: Although awareness of aminoglycoside ototoxicity and ototoxicity monitoring is reportedly high, this study highlights a significantly high incidence of aminoglycoside ototoxicity, particularly in paediatrics where the impact of hearing loss has the greatest dire consequences. This study therefore warrants a critical review of the current monitoring protocols as well as future studies on the treating clinicians’ practices regarding the audiologists’ recommendations following identification of patients with ototoxicity. Additionally, findings of this study recommend experimental studies in the prevention of kanamycin-induced ototoxicity.

Title: High Prevalence of Outer and Middle Ear Pathologies in Observed in Paediatric Patients aged between 4 and 7 years in Rural Limpopo, South Africa

Poster number: 47

Author(s): Dr Chad Mukovhe Phanguphangu

Affiliation(s): 1University of Cape Town

Content: Background: Outer and middle ear pathologies affect half of the 32 million children living with hearing loss worldwide, and the same could be true for the 1.6 million south African children aged below the age of 18 years living with hearing loss. Objective: To determine the prevalence of outer and middle ear pathologies in paediatrics in Limpopo, South Africa. Design: This was a descriptive cross-sectional retrospective review of otoscopy results obtained during a school health screening campaign conducted between March and June 2015. Otoscopic examinations were conducted by audiologists and used to collect the data for this study. Descriptive statistics through percentages and frequency tables were used to analyse the data. Logistic regression was used to determine associations between age, gender and pathologies observed. Study sample: Medical folders of 1089 children aged between 4 and 7 years in grade 1 who underwent hearing screening using otoscopic examinations. Results: Forty-nine percent had normal otoscopy results. A significant 36% had impacted cerumen. Furthermore, 45% of those with impacted cerumen were bilaterally impacted. Additionally, 4% presented with foreign bodies and a further 8% had otitis externa and otitis media. The remaining 3% had tympanic membrane perforations. The odds of developing outer and middle ear pathologies were higher in pupils below 6 years of age (p=0.046). Gender was associated with high prevalence of pathologies as the ratio of females to males presenting with these pathologies was 2:1. A statistically significant association between age and higher prevalence of outer ear pathologies was obtained using logistic regression analysis (p=0.053). Conclusion: This study highlights a high prevalence of outer and middle ear pathologies in paediatrics in Limpopo and therefore recommends comprehensive baseline and periodic screenings; to identify children with outer and middle ear pathologies and need further management, and consequently prevent the
complications of these pathologies. Additionally, this report highlights a rising need for large scale research to provide comprehensive analysis of these pathologies.

Title: Effects of auditory temporal training in children with replacement of voice and voiceless phonemes in written.

Poster number: 29

Author(s): ¹Mayra Pires, ²Eliane Schochat

Affiliation(s): ¹USP, Sao Paulo

Content: Introduction: In Brazilian Portuguese there are similar phonemes distinguished for being voiced and voiceless, like /p/ and /b/. These phonemes require a good auditory discrimination and appropriated mental phonological representation. In literacy it is common for children to replace graphemes, but the rates of orthographic replacement in voiced and voiceless phonemes over the years have been high. It is possible that these children may present deficit in temporal auditory processing, specifically in noticing auditory rapid changes, such as differences in voice onset time and rapid formants transitions. Objectives: The purpose of the present study is to verify if an auditory temporal training program (ATTP) can give support to auditory temporal difficulty and to the reduction of orthographic replacement in voiced and voiceless phonemes. Method: The participants were 16 children. They were nine to 11 years-old; presented normal audiological results, typical neurological development, normal IQ, no speech sound disorders and no speech sound rehabilitation. The children had low scores in Pitch Pattern Sequence Test and replaced voiced and voiceless phonemes in a dictation. Children were divided in two groups: a placebo group that performed passive visual activities and an experimental group that performed the ATTP. To specify the auditory temporal processing difficult, was used the Progressive Temporal Test (PTT), which is an adaptation of Repetition Test that presented variation in inter-stimulus interval of 250, 200, 150, 100, 50 ms (milliseconds) in two tones with different frequency. The ATTP was composed by four games with activities that involved discrimination and ordination of frequencies and discrimination of synthesized speech syllables and words. The auditory temporal training was undertaken in individual computers, in eight sessions of 30 minutes, two times a week. To compare the previous and subsequent evaluations results to the auditory temporal training, two variables were analyzed: the results of PTT and the dictation. Results: In regard to the PTT were found low scores previous the ATTP for both groups in an inter-stimulus interval of 100 ms (mean: 47%) and 50 ms (mean: 40, 7%). After the ATTP, the results of inter-stimulus interval improved 100 ms (mean: 77, 5%) and 50 ms (mean: 75%) in the experimental group. For this group, statistic differences were found between the results previous and subsequent to ATTP — 100 ms [F(1,22)=12.34,p=0.002] and 50 ms [F(1,22)=32.54,p=0.003] — while no statistic differences were found in the placebo group in regard to the passive visual activities. For the experimental group, after the ATTP no was found the
replacement of the following phonemes: /s/?/z/, /k/?/g/, /f/?/v/, /d/?/t/ in dictation, while in the placebo group the replacement of these phonemes were still present. Conclusion: The ATTP can contribute with the rehabilitation of children with orthographic replacement in voice and voiceless phonemes.

Title: Evaluating Gap Detection as an Index of Simulated Tinnitus in Humans and Rodents
Poster number: 32
Author(s): Gina Popal¹, Martine Hamann¹, Dr Doug Barrett¹
Affiliation(s): ¹ University of Leicester

Content: Tinnitus is the perception of sound in the absence of an external stimulus. The subjective nature of tinnitus makes its severity difficult to assess, and clinicians often rely on self-report data from questionnaires. Audiometric tests to quantify the internal percept have been developed, but these are time consuming, and rely on the patient’s ability to compare their tinnitus to an external sound. An alternative method that has been used extensively in animal research, is gap-induced prepulse inhibition of the acoustic startle reflex (GPIAS). The acoustic startle response (ASR) is triggered in the presence of a loud, unexpected sound, and can be quantified in terms of both amplitude and latency. When the unexpected sound is preceded by a prepulse (a lower intensity sound), the ASR is inhibited. When the startle stimulus is embedded in a continuous sound, a silent gap has also been shown to inhibit the ASR. This inhibition is observed in rodents that are assumed to have tinnitus following noise exposure, a finding that has been interpreted as evidence that tinnitus ‘fills the gap’. In humans, studies investigating GPIAS and tinnitus are relatively scarce and have produced conflicting results. The purpose of the current study, therefore, is to assess the extent to which GPIAS generalises from animal to human listeners. Experiment 1 was designed to establish whether GPIAS was robust in human listeners with normal hearing and compare those results to GPIAS in rodents. Experiment 2 tested whether GPIAS was abolished or reduced by the presence of an external sound used to simulate tinnitus in humans and in rodents. GPIAS was robust in rodents whereas they were highly variable in humans: Most showed no difference in the magnitude of ASRs in the presence or absence of gaps, while a minority (7 out of 40) showed a difference in latency in presence of gaps. Simulating tinnitus had little effect on the GPIAS in rodents (N=4) whereas it abolished the GPIAS observed in 6 out of 7 human subjects who had shown prior GPIAS. In conclusion, GPIAS in humans remains too variable to provide a reliable clinical measure. Differences in the effect of simulated tinnitus on GPIAS suggests differences in how external sound is processed in rodents and humans.
Title: Could high-frequency audiometric thresholds provide an understanding of sub-clinical listening difficulties?

Poster number: 33

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Content: Background: Recent work in our laboratory has focused on identifying sub-clinical changes in auditory evoked potentials and auditory perception in audiometrically normal young listeners in relation to lifetime noise exposure. Here we consider whether high-frequency audiometric thresholds could provide a marker of listening difficulties at lower frequencies.

Methods: One hundred and forty listeners aged 18-36 years with normal hearing in the standard audiometric range were tested. 16 kHz audiometric thresholds were acquired using a computer and external sound card with sounds presented over Sennheiser HDA200 superaural headphones. Listeners were required to detect a band of noise that was 4 kHz wide and centred at 16 kHz. A three-alternative forced-choice paradigm was used and the intensity of the target tone was adaptively varied using a two-down/one-up staircase in order to track 71% on the psychometric function. Lifetime noise exposure was estimated using a structured interview technique developed by Lutman et al (2008). A large range of dependent measures were acquired, including auditory brainstem responses (ABRs), psychophysical thresholds, and speech-in-noise measures.

Results: High-frequency thresholds were found to increase as a function of noise exposure in female listeners. There was no significant relation between noise exposure and 16 kHz thresholds in male listeners. Currently, it is unclear whether this is because low-noise-exposed males have higher thresholds than would be expected or whether highly noise exposed females are more susceptible to change in audiometric sensitivity.

High-frequency thresholds were positively correlated with age and a pure tone average taken between 2 and 8 kHz. High-frequency thresholds were also found to be negatively correlated with amplitude modulation detection thresholds and the amplitude of wave I of the ABR. However, the remainder of our behavioural measures, including speech-in-noise, showed no relation to high-frequency threshold sensitivity.

Conclusions: Although these data provide limited evidence that 16-kHz thresholds may reveal sub-clinical changes in auditory nerve function, these high-frequency thresholds do not seem to be strongly related to listening ability for listeners who fall in the normal-hearing range at standard audiometric frequencies. Further investigation is required to determine if high-frequency hearing sensitivity can be used as a more sensitive or earlier predictor of listening difficulties than more commonly used metrics.

Acknowledgements: This work is supported by MRC reference MR/L003589/1 awarded to the University of Manchester.
Title: Illness perceptions to predict hearing service use in people with presbyacusis
Poster number: 48
Author(s): Dr Lisa Wolber¹, Dr Helen Pryce²
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Content: This paper presents findings from a feasibility study to examine the role of illness perceptions in presbyacusis patients to predict service use from an adult audiology service in England. Objective: Hearing loss represents one of the most common features of ageing multimorbidity affecting an increasing proportion of the British population. Help-seeking in this group is characterised by delays in seeking clinical help. Variations in coping are to be expected in all health conditions and these variations are affected by differences in individual attitude and beliefs about the symptoms (referred to as illness perceptions). Methodology: This study aimed to determine the feasibility of using the brief illness perceptions questionnaire (bIPQ) to predict usage of NHS audiology services. The study examined:
• Recruitment and retention to an observational study.
• The acceptability and interpretation of the illness perceptions questionnaire to the target population.
• The risks and burdens inherent in such a study. Study design: A feasibility study using mixed methods. Results: The questionnaire is a comprehensive and quick tool to measure individual illness perception at minimal cost. We propose adaptations of three questionnaire items to increase comprehension. The approach revealed when participants prefer to complete. The approach was deemed low risk and with satisfactory levels of burden for research participants. Conclusions: This approach met our criteria for feasibility. This work prepares us for a full observational study to explore the potential for measures of illness perception to predict service use and uptake as part of coping with hearing loss. This presentation describes work presented in: Wolber, L. E., & Pryce, H. (2016). Measuring the impact of illness perception on NHS audiology service usage in presbycusis patients—a feasibility study. Hearing, Balance and Communication, 1-14.

Title: Beliefs and benefits: clinical approaches towards auditory training for adult cochlear implant users
Poster number: 35
Author(s): Mariana Reis¹, Emma Beedell¹, Dr Isabelle Boisvert¹, A/Prof Catherine McMahon¹
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Content: Despite several published studies on the topic of auditory training (AT), it is still unclear whether this should be delivered for adult cochlear implant (CI) users. While benefits of AT could improve speech understanding and social well-being, studies have shown that AT is not effective for everyone. The last systematic review in this area rated the evidence for AT as very low to moderate and concluded that the evidence was insufficient to guide practice. Therefore, it is still unclear whether resources should be invested in AT for adult CI users. Additionally, few studies have considered how AT is delivered, who is delivering it (i.e. the professional, a significant other, or self-administered), what is encompassed under the term AT and clinicians’ belief’s towards its usefulness. The aim of this study was to describe clinicians’ practices in relation to AT for adult CI users in Australia. A survey was developed and distributed through the professional association of audiologists in Australia, to assess whether and how AT was delivered, such as type, duration and resources allocated, as well as factors that may influence decision-making around these aspects. Seventy-eight audiologists who worked with adult CI users responded to the survey, however only 41 responded to all questions, therefore sample size varied across questions. Results suggested that the methods professionals employ with adult CI users fell into four categories: 1. do not deliver, recommend or refer their clients to AT; 2. refer their clients to a colleague for AT; 3. deliver face-to-face AT; 4. recommend home-based AT. Over 75% of professionals reported using more than one method. The average time allocated for face-to-face AT was 56 min per month, whereas the average time clinicians recommended for home-based AT was 5.5h per month. The most common factor reported by clinicians when deciding when to provide AT was clinical experience. Qualitative analyses of the open format responses showed that the main measures used to evaluate training benefit are subjective reports from clients or significant others, followed by speech perception measures and questionnaires of functional outcomes. Counselling, involvement of significant others and speech perception performance tracking were the main factors reported that were used to promote compliance with the training program. Overall, clinicians’ beliefs about the value of AT in clients’ motivation and confidence had an important influence in the approach that was chosen. These results highlight that current clinical practice related to AT for adult CI users is variable and spans beyond aspects commonly assessed in AT studies. These considerations are important when making clinical recommendations, evaluating the benefits of interventions, as well as when designing further AT studies.

Title: An evaluation of three different care pathways following first time hearing aid fitting.

Poster number: 57

Author(s): Scott Richards¹, Dr Carol Holland¹

Affiliation(s): ¹ Aston University
Scott Richards and Carol Holland, Aston University, Birmingham.

Newly fitted hearing aid patients on the National Health Service (NHS) rarely undertake a program of structured training. Evidence, although equivocal, has demonstrated that communication enhancement training offers improved listening performance for some patients. This study examined the hypotheses that, in addition to hearing and age, other factors may explain variance in speech-in-noise performance and therefore effectiveness of different training programmes. Specifically, the hypothesis was that executive cognitive functions such as ability to inhibit irrelevant processing would have an impact on listeners’ ability to discriminate speech in noise. However, given that listening to speech in noise is demanding of cognitive resources, it may also be hypothesised that improvement as a result of training would release cognitive resources leading to improvement in processing the heard information. Evaluation of three care pathways for mild/moderate hearing loss patients having bilateral hearing aids fitted was undertaken. The pathways were 1. Listening and Communication Enhancement (LACE) (training involved perception of speech in babble, memory, processing speed and inhibition tasks), 2. Structured listening activity training and 3. Standard hearing aid acclimatisation (current NHS practice). Alongside exploring ease of participant recruitment and acceptability of pathways, outcome cognitive function measures were also performed. In total, 37 first time bilateral hearing aid users were recruited, with access to a computer/internet (aged 53-80 years). Assessments involved the Quick Speech-in-Noise test (QuickSIN) with varying babble levels and a Boothroyd, Kowal and Bench (BKB) speech test in noise at a signal to noise ratio (SNR) of -4dB. Cognitive tasks and hearing rating questionnaires were performed before and after the intervention pathway. Hierarchical regression determining predictors of QuickSIN performance used age, hearing threshold and working memory span. There was a significant explanation of performance with more than 75% of variance accounted for. Within this model, working memory tasks accounted for almost 15%. In the ANOVA, there was a significant interaction between pathway/time on the QuickSIN score p<.05, with LACE demonstrating the greatest improvement. This interaction was not significant for the BKB speech in noise task. There were no significant interactions of cognitive tasks with time across the care pathways. There was no correlation post training of task performance with self-rated questionnaire scores examining perception of change. Working memory’s significant contribution to variance in speech-in-noise performance, indicates the role this cognitive ability plays for some listeners. Improvements for the key trained task were demonstrated but there was no evidence of transfer of benefit to either similar (near transfer) or different tasks (far transfer). Potential freeing up of cognitive resource was not demonstrated as there was no significant interaction of time/pathway on the cognitive tasks. Further, any speech-in-noise improvements were not correlated with participants’ self-rating of change.

Title: Design and optimisation of a self-report outcome measure tool in audiology for people with learning disabilities

Poster number: 58
Content: 1. Introduction Healthcare services are under increasing pressure, with the need to establish good outcome measures as part of evidence-based policy and should directly be related to a patient-centred plan. The Individual Management Plan – Outcome Score (IMP-OS) is a tool which not only assesses individual outcomes, but also can be attributed to a whole service (Meyer et al., in press). However, there are still barriers to recording outcomes in healthcare for people with learning disabilities. People with learning disabilities have the right to expect and receive effective evidence-based care. In current audiological practice there may be a tendency to ask a significant other to provide information. However, it is well documented that the outcomes of the patients themselves can differ greatly to that of a significant other report, and as such may not actually target the person’s specific health needs. This study aimed to design a self-report outcome tool for adults with learning disabilities enabling them to express how well we are meeting their needs.

Methods Both a paper-based outcome tool and an interactive tablet application (app) were designed, based on a 3 point Likert scoring scale with a choice of faces, numbers and words, all of which were colour coded similar to traffic lights. Pictures of common audiological needs were created to support the tool. The prototype tools and the research study information were taken to a focus group, with the feedback from the group used to optimise the tool ready for use in the pilot study. The study recruited patients with learning disabilities to score the outcomes of their hearing pathway, based on the agreed needs from their Individual Management Plan (IMP) using one of the two tools. The patient and their significant other or carer were also then asked about their experience of the tool; discussing accessibility, usability and preference.

Results 77% of participants preferred the application based tool rather than the paper-based tool. With regards to choice of scale; 77% preferred the faces scale, 23% the words and 0% the numbers. Themes were identified in the qualitative analysis of the discussions with patients, significant others and carers, clinicians and the focus group and are discussed in a narrative style alongside supporting quotes from the participants.

Discussion Overall, the pilot study gave initial evidence that an outcome tool is appropriate for this population. The flexibility, familiarity and simplicity of the tool developed, appeared to aid patients’ understanding. It also allowed patients to match their skills to an appropriate scoring method. Whilst further validation is now recommended, it was suggested that due to the flexibility and universal nature of the tool, it could be used in wider healthcare and not restricted to Audiological care.

Title: Hearing aid use in UK adults
Poster number: 36
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Content: Objectives: Only 26% of adults with hearing impairment regularly use hearing aids in the UK. The study aimed to determine the demographic, psychological, social and health correlates of hearing aid use among hearing impaired adults aged 40-69 years old in the UK. Method: The research was conducted using the UK Biobank resource. Hearing impairment was identified in 18,730 adults aged 40 and 69 years based on performance on the Digit Triplet test of speech recognition in noise. Participants completed a computerised questionnaire about demographic characteristics, lifestyle and environmental factors, medical information and hearing aid use. Results: Nine percent of adults aged 40-69 years with a hearing impairment reported using a hearing aid most of the time. The strongest predictors of hearing aid use were self-reported hearing difficulties (OR 31.81 (95% CI 21.28, 47.55)) and difficulties in background noise (OR 4.19 (95% CI 3.18, 5.53)). Individuals from an ethnic minority background were less likely to use a hearing aid compared to individuals from a white British ethnicity (OR 0.55 (95% CI 0.43, 0.70)). With each year of age individuals were 4% more likely to use a hearing aid (95% CI 1.03, 1.05). Sex and educational level were not associated with hearing aid use. Tinnitus (OR 1.39 (95% CI 1.24, 1.56)) and chronic illness (OR 1.88 (95% CI 1.65, 2.15)) were associated with hearing aid use. But individuals with poorer self-reported health were less likely to use their hearing aid compared to individuals who reported excellent health (OR 0.71 (95% CI 0.53, 0.94)). Social factors including living status and participation in social activities were associated with hearing aid use. Individuals who live alone were 0.78 times less likely to use their aid compared to individuals who live with others (95% CI 0.67, 0.91). For each social activity participated in, individuals were 8% more likely to use their aid (95% CI 1.01, 1.16). Conclusions Hearing aid use was associated with psychosocial and demographic factors including recognition of hearing problems, ethnicity, age, social factors and perceived health. Addressing low hearing aid uptake requires understanding of how psychosocial and demographic factors contribute to hearing aid uptake.

Title: Outcome measures and associated problem domains used in efficacy studies of combination hearing aids for tinnitus.
Poster number: 37

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Content: Background Sound therapy is the preferred mode of audiological tinnitus management and refers to a wearable sound generator or hearing aid. Recent innovations have seen the arrival of combination aids: hearing aids with built-in sound generators. The evidence for the efficacy of combination aids for tinnitus is limited due to a lack of well-designed definitive trials. One issue when designing a clinical trial is the choice of outcome measures. The aim was to collate a list of outcome measures used in the studies looking at the efficacy of combination aids for tinnitus and map them onto problem domains. Methods As a part of a scoping review to establish current knowledge around combined amplification and sound generation for tinnitus we populated the list of outcome measures used in published studies. We have identified the problem domains covered by items in the tinnitus-specific measures using an inductive thematic analysis approach. Results Forty three different outcome measures were identified. Researchers mainly used tinnitus-specific questionnaires (n=29) followed by Visual/Numeric Analogue Scales (n=16, across 9 studies). The most common questionnaires were Tinnitus Handicap Inventory (n=13), Tinnitus Handicap Questionnaire (n=5) and Tinnitus Functional Index (n=4). Visual/Numeric Analogue scales most commonly measured loudness (n=4) and tinnitus annoyance (n=3). We have identified 18 problem domains including interference with activities/relationships, coping styles, emotional impact, sleep, cognition and speech. Discussion There is a marked variability in the choice of outcome measures and domains measured when assessing clinical efficacy of combined amplification and sound generation for tinnitus. This points to the urgent need of developing a Core Outcome Set in Tinnitus. Standardisation of outcome measures would provide a framework for the design of clinical trials for tinnitus. It will also reduce variability in outcomes between studies therefore enhance future systematic reviews and meta-analyses.

Title: Combined amplification and sound generation for tinnitus: survey of UK clinical practice. 1 National Institute for Health Research (NIHR) Biomedical Research Centre, Nottingham, UK, 2 Otology and Hearing Gro

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Content: Introduction
Combination devices provide both amplification and sound generation, and new generation devices offer the same amplification features as their 'standard' hearing aid counterparts. A recent British Tinnitus Association service evaluation showed that 74% of UK audiology clinics can offer combination hearing aids. There is lack of any clear recommendations about candidature and prescription options for combination hearing aids. The purpose of this survey was to determine current clinical practice and the level of knowledge about combination hearing aids for tinnitus amongst clinicians in the UK.

Methods
An online survey consisted of 20 closed and 10 open questions. The survey gathered the opinions of UK hearing professionals regarding the criteria for candidacy and fitting practices for combined amplification and sound generation for tinnitus. Results
Ninety hearing professionals responded. They have either fitted (77%), considered fitting (18%), or would never fit (5%) combination aids for tinnitus patients. Main barrier for those who have not fitted combination aids was lack of expertise. Clinicians would consider fitting combination aids for those patients for whom amplification alone was not sufficient for managing tinnitus (81%) or if patients requested to try them (64%). There were differences in opinions regarding: 1) the level of noise to use; 2) time to wait between fitting amplification and adding noise; 3) recommended use during the day.

Conclusions
The survey is a first step towards development of recommended procedure for fitting of combination hearing aids for tinnitus that will aid clinical practice. This work was initiated by the British Society of Audiology Tinnitus and Hyperacusis Special Interest Group and is currently ongoing.
Content: Introduction: Sound therapy is a core component of many tinnitus management programmes. Recent years have seen a substantial increase in the use of mobile technology. This provided an additional medium via which sound therapy can be delivered. Despite increasing popularity of mobile applications (apps) in general it is unclear what proportion of people use apps for tinnitus management and which apps are most popular. Also deeper and independent assessment of tinnitus apps that would assess quality of apps and mechanisms of action is lacking. The purpose of the study was to identify apps that people use for tinnitus management, identify reasons for using and not using apps, evaluate their content and quality.

Methods: An online survey consisting of 33 questions gathered people’s views about mobile apps for tinnitus management, including reasons for use/non-use, factors important when choosing an app, preferred apps, perceived help for tinnitus and positive/negative aspects of the apps. We have also looked at the content of the apps listed by people to identify options and management techniques included in the apps. Quality of the apps was assessed using Mobile Application Rating Scale (MARS, Stoyanow et al., 2015).

Results: 643 people responded to the survey, 25% of people used an app and 75% have never used an app to manage their tinnitus. The main reason for not using apps was lack of awareness (79%). Ease of use was an important factor when choosing an app (87%), followed by trustworthy source (44%), reviews (39%) and cost (39%). People identified 53 different apps that they have tried for managing tinnitus, from which 13 were listed by at least two people. Content of the apps included: 1) various sound options; 2) relaxation/meditation; 3) information and advice; 4) psychological approaches. MARS quality scores varied between 1.6 and 4.2 (out of 5) for the 13 most popular apps.

Discussion: There is a wide variety of apps that people use to manage their tinnitus. Some of those apps were developed specifically for tinnitus management while majority were developed with other problems in mind (e.g. sleep difficulties, relaxation difficulties, stress). People who tried apps tended to find aspects that helped with their tinnitus or accompanying problems. However, lack of awareness was the main barrier to use of apps by people with tinnitus.

Conclusions: Further research should consider the place for apps in the tinnitus management (standalone self-management intervention vs part of the management by a hearing professional). As content of the apps varies in respect to sound options, information and management strategies it seems that the choice of the best management app should be guided by individual patient needs and preferences.
Content: Gatehouse et al (2006a,b) showed how the potential for a successful hearing aid fitting involved factors “beyond the audiogram”, such as lifestyle and cognitive capacity. In order to collect sufficient breadth of factors, their studies were laborious and costly, so limited to a small section of the potential population. Nowadays, the routine care pathway for hearing-impaired patients simultaneously generates a data record about the patient and their hearing loss. Additionally, the hearing aid records further information about how the aid is being used and how it is responding to the situations in which it is used. Combined, these paint a much wider picture about the requirements and behaviour of the patient than just the audiogram alone. The data sets generated by these automated methods are enormous, and not readily amenable to traditional statistical methods of analysis. The computer science field of “data mining” provides a suite of tools to perform such analyses. A heavily redacted database was obtained from a hearing aid manufacturer and subjected to data mining. A certain level of “cleaning” was required to remove incomplete or corrupt datasets. Findings from previous, labour-intensive studies were replicated such as the generic shapes of audiograms, and a linkage between style of device (BTE/ITE) and the sound environments in which the device was used, a proxy for patient lifestyle. Anomalous fittings, as well as anomalous device behaviour, were also identified. This “proof-of-concept” work shows how data mining may help improve the quality of service delivery from a variety of perspectives. References: Gatehouse S, Naylor G and Elberling C (2006a) Linear and nonlinear hearing aid fittings – 1. Patterns of benefit. Int J Audiol 45(3): 130–152. Gatehouse S, Naylor G and Elberling C (2006b) Linear and nonlinear hearing aid fittings – 2. Patterns of candidature. Int J Audiol 45(3): 153–171.
diagnosed in those with a diagnosis of dementia [8,9]. Despite the significant impact diminished cognition can have on individuals, care-givers, the healthcare economy and society; and hearing loss being one of the few potentially modifiable late-life risk factors for cognitive decline, there is no national strategy for the early identification and management of age-related hearing loss and there is a lack of national guidance for the effective assessment and intervention for the estimated 316,000 individuals living in the UK with hearing loss and dementia [1]. This can result in wide variation in clinical practices/service provision which can adversely impact individual decision making about healthcare choices leading to inconsistency in the quality of care provided. Improving the efficiency of healthcare provision, particularly within hospitals serving areas with higher life expectancy rates, has the potential to improve experience and outcomes, and reduce the pressures to provide efficient services to an ageing population.

Methods: In recognition of my interest in this area, I received the honour of a Winston Churchill Memorial Trust Fellowship. This allowed me to travel to the USA with the aim to source innovation and best practice, compare and contrast clinical practice and investigate the experience of individuals and their families. In recognition of the absence of national guidance and the need to provide innovative direction, all forms of evidence were considered. My itinerary, guided by personal experience, peer discussion and findings from a systematic literature review, allowed evidence to be gathered from a range of learning opportunities including observation of clinical practice, research studies, anecdotal reports and informal cohort studies.

Results: The evidence was recorded and reviewed on my return. Key themes, mapped into four overarching recommendations, are discussed. Conclusions: Evidence gathered suggests understanding is improving and advances are being made in the quality of care provided. Bourne from recognition of limited success administering standardised protocols due to the variability of symptomatic manifestations and abilities, clinicians have developed innovative approaches to evaluate and provide interventions that optimise communication and maximise meaningful social participation. Although largely unvalidated, they demonstrate that it is possible to complete assessment and develop interventions which offer great potential to positively impact disease prevalence, quality of life improvement and healthcare expenditure.

Title: A psychologically informed, audiologist-delivered, manualised intervention for tinnitus
Poster number: 60

Author(s): John A Taylor¹ ², Dean M Thompson¹ ², Deborah A Hall¹ ², Dawn-Marie Walker³, Mary McMurran⁴, Amanda Casey⁵, David Stockdale⁶, Debbie Featherstone⁷, Carol MacDonald⁸, and Derek J Hoare¹ ²

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Content: In the UK National Health Service (NHS) specialist tinnitus care is increasingly the domain of the audiologist yet there is no standard tinnitus protocol in use and treatment varies. Also, there is no evidence for the efficacy of psychological interventions for tinnitus when delivered by audiologists. The aim of this study was to develop a psychologically informed guidance manual to support audiologist management of tinnitus and conduct a feasibility randomised controlled trial (RCT) to establish whether this manualised care versus treatment as usual (TAU) can be evaluated in a fully powered RCT.

Material and Methods
From a scoping review and Delphi survey, core attributes of tinnitus counselling were identified. These were incorporated into a guidance manual underpinned by a cognitive model of tinnitus and the use of relational skills. Across 3 sites, 30 patients are being randomised to either 1) psychologically informed management from an audiologist trained in the manual or 2) TAU from an audiologist not trained in it. The feasibility and acceptability of the manualised treatment will be evaluated with patients and audiologists via qualitative interviews and completion of quantitative outcome measures. Results - The manual comprises the following treatment areas which can be selected from dependent on individual need: tinnitus education, the emotional consequences of tinnitus, relaxation, fear and avoidance, unhelpful thinking, physical exercise, sleep, attention, monitoring and acceptance, and sound therapy. Recruitment to the feasibility trial and intervention delivery are in progress.

Discussion
The feasibility of a fully powered RCT will be assessed via compliance with the manual, willingness to be randomised, number of eligible participants, rate of recruitment, retention, and collection of quantitative outcome measures and qualitative data. Conclusions - This research offers a first step to an evidence-based, standardised and accessible approach to tinnitus care. Acknowledgement: This abstract presents independent research funded by the National Institute for Health Research (NIHR) under its Research for Patient Benefit (RfPB) Programme (Grant Reference Number PB-PG-0613-31106). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.
Objectives: Responses to natural speech stimuli may have application to assess speech reception in people who are not able to respond reliably on behavioural tests (such as infants). Ideally, these tests would allow simultaneous measurement of speech processing by the auditory brainstem and cortex, such that audiologists can analyse the functionality of the auditory system at multiple levels. The use of natural speech could also be beneficial in optimising hearing aid fitting, as it would allow observation of the effect of the hearing aid settings to ecologically relevant stimuli. In the current work the feasibility of detecting objective brainstem and cortical responses to words using the electroencephalogram (EEG) was investigated. Design: Four repeated words were presented sequentially at 70dBA through ER-2 insert earphones to 12 normal hearing adults. The stimuli consisted of a prolonged vowel in a /hVd/ structure (where V represents different vowel sounds). Each stimulus was presented over 440 sweeps (220 condensation, 220 rarefaction). Stimuli were presented at a rate of one per second. EEG data were collected from 12 normal hearing adult participants. After pre-processing and artefact removal, brainstem responses were analysed based on envelope frequency following response (eFFR) detection. Strength of the eFFR was assessed using the Hotelling’s T2 test (HT2) in the frequency domain. This test allows response detection at multiple frequencies simultaneously, including both spectral amplitude and phase characteristics of the response. In this study, eFFRs were detected based on characteristics at the glottal frequency and its first two harmonics. Cortical responses were analysed using HT2 in the time domain. For this purpose, evoked responses over the 1-second segment were divided into 100 millisecond segments. To test whether a response could be detected beyond the onset response, a further test was performed on the first 5 segments (including the onset) and the last 5 segments (excluding the onset). Results: EFRs could be detected for 83% of 48 tests (4 wordsx12 participants), with each participant showing a response for at least one of the stimuli. Median response detection time was 72 s (85% range 36.7-158 s). Detection success and time showed strong inter-individual variability. Cortical responses could be detected in 98% of tests when including the complete response, and 85% of tests when excluding the onset response, with detection time of 45 s (85% range 19.15-140 s). Conclusion: The study shows a paradigm for simultaneously analysing brainstem and cortical responses to ecologically relevant stimuli on subjects with normal hearing thresholds using the HT2 test. Responses can be detected within a time interval relevant for clinical environments. Inter-individual variability in eFRs suggests the use of multiple stimuli would be beneficial for appropriate assessment of hearing function.

Title: The impact of hearing loss on television viewing preferences and behaviour
Poster number: 62
Introduction: A recently completed systematic review identified numerous studies that reported the negative impact of hearing loss on television viewing among hearing aid users and their partner (see poster by Vas, Akeroyd & Hall). In particular, individuals with hearing loss often report having to raise the volume of the television, even whilst wearing their hearing aid(s). Furthermore, several qualitative studies that have investigated the impact of hearing loss on partners of hearing aid users report the volume of the television being too loud for them as a consequent issue. Yet, there has been no attempt to objectively measure the impact of hearing loss on television viewing on hearing aid users and their partner. The aims of the current study are: (1) To measure and compare the preferred volume setting of participants who are hearing aid users, and their partners; (2) To identify agreement in the preferred volume-setting within couples; and (3) To identify self-reported television viewing habits.

Methods: The research was conducted using a single centre, prospective case-control design. Forty-two couples aged between 35 and 81 took part in the study, giving a total sample size of eighty-four participants. Each couple comprised of a hearing aid(s) user and a non-hearing aid user. Full pure-tone audiometry and uncomfortable loudness levels was performed on all participants. Participants were individually presented via a television screen a series of 12 short television clips taken from 6 different programmes. The duration of each clip was 1.5 minutes and all the clips varied in terms of their spectral and visual content. Participants were instructed to set their preferred volume for each clip using a remote control. The resultant sound level was measured with a sound level meter placed next to the participant. Each couple also viewed one television clip together and control of the remote was randomised so that either the hearing aid user or partner was able to set the volume. Hearing aid users were also required to complete part 1 of the Speech, Spatial and Qualities of Hearing Scale and all participants completed a survey that explored their general television viewing habits. Testing was conducted in a quiet, purpose-designed test room. Results: Recruitment and testing is now complete, and data analysis is ongoing. Indicative findings are of a substantial difference in preference for television sound level that is in the order of 5-6dB greater for the person with hearing loss than for their partner.

Conclusion: The impact of hearing loss on television viewing has been identified as an important issue for hearing aid users and their partners. The current study addresses this research gap. Our findings could help with rehabilitation discussions and with identifying suitable strategies for those couples where TV viewing is problematic.
Title: A systematic review of domains relating to the everyday impact of hearing loss, as reported by patients or their communication partner(s)

Poster number: 63

Author(s): Venessa Vas 12, Michael A. Akeroyd 23, Deborah A. Hall 12

Affiliation(s):
1 National Institute for Health Research (NIHR) Nottingham Biomedical Research Centre, Nottingham, NG1 5DU, UK.
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3 Medical Research Council Institute of Hearing Research, The University of Nottingham, University Park, Nottingham NG7 2RD, UK.

Content: Introduction: Adult onset hearing loss is the third largest cause of Years Lost to Disability, according to the World Health Organization. Several recent comprehensive reviews of the audiological literature have shown that there a large number of different assessment tools used to evaluate the impact of hearing loss, with very little consensus among clinicians and researchers as to either preference or psychometric adequacy. Furthermore, it is unclear whether multi-item questionnaire instruments adequately assess what patients report as the major consequences of hearing loss. This systematic review therefore seeks to identify the status of knowledge on what adults with hearing loss and their communication partners consider as problems occurring as a result of their hearing loss in their everyday lives. In the context of a systematic review, we have collated generic and hearing-specific complaints and grouped them into domains.

Methods: Electronic searches were conducted in Cos Conference Papers Index, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), EMBASE, PubMed, Web of Science, and Google Scholar to identify publications from 01 May 1982 to 15 August 2015. Of the 9516 titles identified, 76 records met our inclusion criteria and were taken through to data collection. All relevant data items were analysed using a meta-ethnographic approach, together with techniques from grounded-theory to form domain groupings representing the most commonly reported complaints of hearing loss. An inductive grouping approach was conducted separately for (i) adults with hearing loss, and (ii) communication partners to create two conceptual frameworks which were then evaluated.

Results: Domains and subdomains mutual to both empirically derived conceptual frameworks encompassed concepts related to “Auditory” (listening, communicating, speaking), “Social” (relationships, isolation, social life, occupational, interventions), and “Self” (effort and fatigue, emotions, identity, stigma). A number of subdomains were comprised of complaints that were specific to a particular situation or scenario, such as “listening to the TV or radio at a loud volume” or “conversing in noisy environments”. There was substantial overlap across the two frameworks, especially within the “relationships” and “social life” subdomains. The pattern of patient-reported complaints varied little as a function of hearing loss severity.

Conclusion: The frameworks aim to capture the far-reaching
effects of hearing loss from both personal perspectives. Patient-reported complaints provide a unique resource that can be used to inform the healthcare professional’s choice of questionnaire instruments for diagnostic assessment. Registration details: The systematic review protocol was registered on PROSPERO (International Prospective Register of Systematic Reviews) on 31st July 2015 and has been published: Vas V, Akeroyd MA, Hall DA (2016) Domains relating to the everyday impact of hearing loss, as reported by patients or their communication partner(s): protocol for a systematic review. BMJ Open 2016;6:e011463. doi: 10.1136/bmjopen-2016-011463.

Title: Bilateral symmetrical structural cochleo-vestibular abnormalities with asymmetrical cochleovestibular dysfunction

Poster number: 41

Author(s): Safeera Vavda¹, Dr Soumit Dasgupta¹

Affiliation(s): ¹Alderhey Childrens Hospital NHS Trust, Liverpool, UK

Content: Introduction
One of the commonest cochleovestibular structural abnormalities include Mondini’s defect and one of the rarest is an X-linked Gusher. These usually demonstrate bilaterally symmetrical structural cochleovestibular abnormalities. However, the cochleovestibular function may be asymmetrical. We present two such cases as part of our ongoing research in a tertiary teaching paediatric audio vestibular unit.

Case 1
A 6 year old girl was diagnosed with a congenital right sided profound hearing loss and a mild progressive left sensorineural hearing loss, currently amplified with a BICROS hearing aid. She was delayed in her motor development. On the vHIT, a significant reduction of the Vestibular Ocular Reflex (VOR) gain was observed on the right semi-circular canal system involving all canals with overt and covert saccades. In comparison, the left semi-circular canal system showed normal function. On the MRI, she showed symmetrical Mondini type 2 deformities bilaterally with absent modiolus at the apex and the middle cochlear turns and an intact basal turn and its modiolus. There is also evidence of bilateral semi-circular canal dysplasia along with dilated vestibules and dilated vestibular aqueducts. Case 2
A 12 year old boy was diagnosed with X-linked Gusher syndrome who presented with no recordable hearing thresholds in the left ear and a progressively severe sensorineural hearing loss in the right ear, currently amplified with a cochlear implant in the left ear and a hearing aid in the right ear. There were overt problems with his balance. On the video Head Impulse Test (vHIT), a significant reduction of the VOR gain was observed on the right anterior semi-circular canal with overt saccades whilst the left semi-circular canal system showed a significant reduction of the VOR gain on the anterior and posterior canals, again with overt saccades. On the high resolution CT scan, he showed bilateral symmetrical cochlear dysplasia and abnormal dilatation of both internal acoustic meati. The modioli are deficient bilaterally with loss of basal partition.

Discussion
The question therefore is why the symmetrical structural abnormality of the cochleovestibular system in the above two cases is manifesting in an
asymmetrical cochleovestibular dysfunction. We propose that the endolymphatic fluid movement in the bony labyrinth is different even in cases of anatomical symmetry which explains the discrepancy of function and also explains that in both cases, the relatively good side had shown worsening. In addition, this is the first time that we have objectively and successfully quantified vestibular function in these children which opens up a new dimension in management.

Conclusion

It needs to be borne in mind that symmetrical abnormal cochleovestibular anatomy on both sides is not necessarily accompanied with symmetrical dysfunction on either side.

Title: Take on Tinnitus - creating an e-learning platform for people with tinnitus

Dave Carr, British Tinnitus Association

Poster number: 64

Author(s): Nic Wray1, Dave Carr1

Affiliation(s): 1British Tinnitus Association

Content: Aim

The aim of the Take on Tinnitus project was to design and deliver online concise accurate information to people who were new to tinnitus in a timely and reassuring manner.

Material and methods

From conversations with people with tinnitus on the British Tinnitus Association’s (BTA) helpline and through the network of support groups, we identified that not everything on the internet is useful, accurate, or beneficial to people with tinnitus as quality and veracity is variable. Time can be wasted or anxiety increased by accessing online resources that make unsubstantiated claims.

After an initial scoping exercise an e-learning programme was developed based on training provided to BTA helpline volunteers, underpinned by BTA information resources. A specialist e-learning company worked alongside BTA staff to develop a series of modules each focusing on a common area of tinnitus. For each module a storyboard and script was produced. By working with the BTA Professional Advisers’ Committee, trustees, hearing professionals and people with tinnitus we were able to identify areas of need, test prototypes and check for bugs. Take on Tinnitus can be used on mobile phones, tablets or computers. After an initial taster unit, there are seven learning modules covering fundamentals of tinnitus, hearing and tinnitus, benefits of using sound, tinnitus and relaxation, sleep and tinnitus, benefits of talking about it and living your life with tinnitus. Each module takes 10-15 minutes to complete. Each includes interactive exercises, video clips and self-tests to keep users engaged.

A key aspect to the Take on Tinnitus site was using video. Three video subjects were selected: A BTA volunteer, case study member and a support group organiser. The subjects were chosen in part to bring a diverse feel to the video clips, but also because they all had very personal stories of how they live with tinnitus.

A bespoke Learning Management System (LMS) was developed to register users on to the site. This was to ensure the registration process was as user-friendly as possible and would allow for automatic follow up monitoring of users using quality of life questions based on the Tinnitus Functional Index.
Results
To date the Take on Tinnitus site has received over 1700 registrations from people with tinnitus and quantitative feedback from GPs, hearing therapists and audiologists has been extremely positive. Conclusions
E-learning has become an important part of the support provided to tinnitus patients. An e-learning site such as Take on Tinnitus can provide immediate reassurance to someone experiencing tinnitus for the first time, give basic information on the condition prior to visiting a GP and provide a useful support if waiting for a referral on from the GP to other NHS services.

Title: General Practitioner support for tinnitus – a survey of patient experience
Poster number: 65
Author(s): Nic Wray1, Emily Broomhead1
Affiliation(s): 1 British Tinnitus Association

Content: Introduction - Approximately 10% of adults in the UK experience tinnitus. In around 1% of adults, tinnitus may affect quality of life. There are approximately 750,000 General Practitioner (GP) consultations for tinnitus each year. Access to reliable information, on-going support and reassurance are key elements in the management and treatment of tinnitus. The British Tinnitus Association (BTA) aims to play a key role in the delivery of these functions and we wish to support GPs in their vital role

Method
A nine question survey was devised which asked basic questions about the respondent’s experience of asking for help for tinnitus from their GP, and the services that the GP offered them. The BTA distributed a link to the survey, which was hosted on SurveyMonkey, to all BTA members for whom we had an email address via Mailchimp. This was sent to 1539 people. We received 928 completed questionnaires.

Results
• 53 per cent of respondents were unsatisfied with their GP’s response
• 92 per cent of unsatisfied patients stated they felt their GP was ‘dismissive or unsympathetic’, or ‘didn’t have enough knowledge’
• 706 of 928 respondents were referred to ENT or audiology. Of those, 88 per cent had to wait up to four months for an appointment.
• In addition, 85 per cent were not offered any further support from their GP while they waited and just under half (48 per cent) said their tinnitus had a ‘moderate’ or ‘severe impact’ on their quality of life during this time.
• 42 per cent of people questioned also said they had to return to their GP about their tinnitus after their initial visit.

Discussion
It is clear that people with tinnitus feel they are not getting the best possible help when first diagnosed with the condition. There is a knowledge gap within the medical community about the impact tinnitus can have and many patients don’t feel listened to or supported enough. This is having an unnecessary impact on their quality of life and on the NHS as they make repeat visits to their GP. The BTA produced the first Guidelines for Tinnitus for GPs to address this knowledge gap.

References

Davis A, El Refaie A (2000) 'The Epidemiology of Tinnitus.' In Tyler R (ed.) The
Title: Does clinical history influence audiologists' task in estimating hearing threshold of auditory brainstem response (ABR) for infants

Poster number: 69

Author(s): Dr Maha Zaitoun

Affiliation(s): 1Jordan University of Science and Technology

Content: Abstract Aim: This study examined whether audiologists' performance in estimating hearing threshold for infants through the interpretation of auditory brainstem response (ABR) results is affected by the presence of clinical history information.

Methods: Comparison for the performance of 14 audiologists in evaluating ABR hearing threshold for 16 infants was conducted over two rounds. During the first round, audiologists were presented with ABR traces that included the age of the child at the time of the testing only. During the second round, audiologist were asked to interpret the same ABR traces but this time they were accompanied with detailed clinical history. Audiologist were not aware that they are evaluating the same set of cases over the two occasions. Audiologists' performance in regards to sensitivity, specificity and accuracy were evaluated on the two occasions.

Results: No statistical significance was observed in audiologist' performance when clinical history were provided with ABR results versus when it was not provided. Saying that, it was noted that the mean numbers of true negative (TN) incidences and true positive (TP) diagnoses incidences were slightly higher when full clinical history were provided to audiologists.

Conclusions: This study suggests that audiologist' performance in estimating hearing threshold for infants is not affected by the presence of clinical history information. Therefore, missing clinical information at the time of testing should not raise any concern regarding the radiologists' ability in reading of ABR traces.
Exhibitor Information

**Action on Hearing Loss**

Action on Hearing Loss is a national charity representing 11 million people with deafness, hearing loss and tinnitus across the UK. We help people confronting deafness, tinnitus and hearing loss to live the life they choose. We enable them to take control of their lives and remove the barriers that stand in their way.

Stand Number: 1  
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Website: [www.actiononhearingloss.org.uk](http://www.actiononhearingloss.org.uk)

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Website: www.auditdata.com

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Email: bsa@thebsa.org.uk

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**Stand 3** - Amplifon Ltd
**Stand 4** - IAC Acoustic UK Ltd
**Stand 4b** - Cochlear
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**Stand 6** - Oticon
**Stand 7** - Phonak
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**Stand 9** - PC Werth (an Intricon Group Company)
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**Stand 30** - BSHAA
Join the BSA

The British Society of Audiology (BSA) is one of the largest learned societies in Europe, the Society specialises in the research, and the practice of the Audiology Sciences. The Society is open to ALL people with an interest in Audiology and hearing science, including audiologists, otologists, hearing aid dispensers, speech and hearing scientists, hearing therapists, teachers of the deaf, educational audiologists, people with a hearing loss and their families or friends. Put simply, if you have an interest in Audiology, the BSA is for you.

We offer 3 different membership types at the BSA:

- BSA full membership
- BSA student membership
- BSA organisation membership

If you are interested in joining the BSA and becoming a member, please see one of our friendly staff members at the BSA stand within the exhibition. Alternatively, you can visit the BSA website for more information on each of our membership categories: [http://www.thebsa.org.uk/contact/join-british-society-audiology/](http://www.thebsa.org.uk/contact/join-british-society-audiology/)

Full membership is open to anyone with an interest in Audiology or Hearing Science; a qualification is not required.
Annual Conference 2018

We hope that you all enjoy the 2017 Annual Conference at the Majestic Hotel, Harrogate.

Please save the date for 2018...We will be taking the Conference to the Hilton Brighton Metropole on the 7th and 8th of June 2018.

This conference will encompass the theme of *Inspiring Connections*

We hope to see you all in Brighton next June!