**BSA Annual Conference Programme**  
**Keele University**  
**1st – 3rd September 2014**

**Quick guide:**  
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## MONDAY 1st September

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# Session 4

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End of meeting
BSA Annual Conference 2014

Oral presentations
Monday 1st September

Westminster Theatre

13.00. Opening Keynote I: Scientific evidence within the clinical context  
Prof. Anne Schilder, University College London.

14. 00. Symposium: From Hair Cells to Hearing

14.00. The sensory hair cell in normal hearing and disease  
Prof. Dave Furness, Keele University

14.35. Coding of acoustic information in the auditory pathway  
Prof. Alan Palmer, MRC Institute of Hearing Research, Nottingham.

15.10. Integrating acoustic and electric information following cochlear implantation  
Dr. Padraig Kitterick, NIHR Nottingham Hearing Biomedical Research Unit.

15.45 Break

16.15. Listening difficulties and auditory processing disorder (APD) in children: proposed mechanisms  
Prof. David Moore, Cincinnati Children’s Hospital, Cincinnati, USA.

17.15. The Twilight Lecture: The Acoustics Behind Sonic Wonderland  
Prof. Trevor Cox Salford University, Manchester.

18.00 Social event – wine and nibbles

Room 1.098

14.00. Sponsor Workshop – Oticon (Alison Stone)  
14:00 – 14:30 Evidence for a new compression strategy for children  
14:45 – 15:15 New clinical tools for paediatric fittings  
15:25 – 15:45 Connectivity for Kids

16.15 PM: Sponsor Workshop Interacoustics
Tuesday 2\textsuperscript{nd} September, morning  
Westminster Theatre

\textit{Dr Stefan Launer, Phonak, Zurich, Switzerland}

9.30. BSA AGM

10.30. Professional Practice Committee Symposium – How you can make audiology better

10.30. Introduction  
\textit{Graham Frost, PPC Vice Chair}

10.35. What PPC is doing to make audiology better  
\textit{Dr Daniel Rowan, ISVR, Southampton University.}

11.00. The impact of NICE accreditation  
\textit{Deborah Collis, Associate Director, Accreditation and Quality Assurance, NICE}

\textit{Dr Sebastian Hendricks, Barnet & Chase Farm Hospitals and the RNTNEH}

11.55 Summary  
\textit{Graham Frost.}

12.00 – 13.00. Lunch

\textbf{Room 1.098}

11.00. Sponsor Workshop – Tinnitus Clinic  
Tinnitus pathophysiology and evolving clinical options for therapy.  
\textit{Mark Williams:}

12.00 – 13.00. New/young members workshop
Tuesday 2\textsuperscript{nd} September, afternoon  
Westminster Theatre

13.00. Keynote III: Speech recognition and spatialisation in complex listening environments: effects of hearing aids and processing  
\textit{Prof. Todd Rickets Vanderbilt Bill Wilkerson Center for Otolaryngology, Nashville, USA}

\textbf{Oral Presentations}


15.00 – 15.15. \textit{L.Zhang, P.Jennings and F. Schlaghecken. Learning to ignore background noise in VCV test}


\textbf{Break}

16.15 – 16.30. \textit{Brian C.J. Moore and Sara M.K. Madsen. Preliminary results of a survey of experiences in listening to music via hearing aids}

16.30 – 16.45. \textit{J. L. Verhe and J. Hots} Mid-bandwidth loudness depression in hearing-impaired listeners


17.00 - 17.10. Action on Hearing Loss presentation.

\textbf{BSA Awards Ceremony and Poster Prizes}
Meeting Room 1.098

Paul Leeming, Support Audiologist

Meeting Room 1.099

14.00. BSA ARIG Discussion forum on patient-centred care: “Who defines rehabilitation?”

(i) shared decision making
(ii) facilitating change through developing self-efficacy
(iii) outcome measures for clinicians and researchers

Led by Amanda Casey, Dr. Helen Pryce and Dr. Mel Ferguson

19.30-23.00. Conference dinner in Keele Hall

Wednesday 3rd September, morning
Westminster Theatre

8.30-9.30. Large scale hearing studies using the UK Biobank resource

Introduction to UK Biobank session
Prof. Kevin Munro, University of Manchester.

Hearing in middle age: a population snapshot
Prof. Kevin J Munro.

Cigarette smoking, alcohol consumption and hearing
Dr. Piers Dawes, University of Manchester.

Speech in noise hearing, pure tone threshold and cognition
Prof. David Moore, Cincinnati Children’s Hospital, Cincinnati, USA.

Hearing loss and cognitive decline: the role of hearing aids, social isolation and depression
Dr. Piers Dawes

Concluding comments
Dr. Piers Dawes


12.30 Discussion on the future plans for the Annual Conference (open to all)
Lecture theatre 01

10.30-11.15. BSA Auditory Processing Disorder SIG update: Onwards and Upwards
Dr Nicci Campbell, ISVR, University of Southampton, and Prof Dave Moore, Cincinnati Children’s Hospital, Cincinnati, USA.

11.15-12.00. BSA Balance Interest Group update
The Video Head Impulse Test and its relationship to caloric testing
Dr Steven Bell, Hearing and Balance Centre, University of Southampton.

Motivational approach to behaviour change in vestibular rehabilitation to improve clinic attendance
Dr Nicola Topass, Audiology Department, Royal Surrey County Hospital.

Room 1.098

10.30-12.30 BSA Journal Club: Adult Hearing Screening
Led by Dr Cherilee Rutherford, Dr Lorraine Gailley, John Day

12.30 – 13.20. Electrophysiology SIG meeting

12.30 Lunch

Wednesday 3rd September, afternoon
Westminster Theatre


Oral Presentations
Parallel session 1


15.00 – 15.15. L.D. Orton and A. Rees. Commissural improvement of sound level sensitivity and discriminability in the inferior colliculi


15.45 – 16.00. N.P. Todd and C.S. Lee. Source analyses of vestibular evoked potentials (VsEPs) activated during rhythm perception

Lecture theatre 1

Parallel session 2


14.45 – 15.00. S.E.I. Aboagye*, M.A. Ferguson‡, N. Coulson‡, J. Birchall‡‡ and J.G. Barry*, “You’re not going to make me wear hearing aids are you?” Factors affecting adolescent’s uptake and adherence to aural habilitation

15.00 – 15.15. S. Dasgupta, S.Raghavan, M.O’Hare and L.Marl. X linked gusher syndrome – a rare cause for hearing loss in children

15.15 – 15.30. S. Wadsworth, H. Fortnum, A. McCormack and I. Mulla. What encourages or discourages hearing-impaired children to take part in sport?

15.30 15.45. G. Al-Malky, M. De Jongh, M. Kikic, S.J. Dawson and R. Suri. Assessment of current provision for auditory ototoxicity monitoring in the UK

15.45 – 16.00. D. Hewitt. Everything an Audiologist needs to know about speech in noise

16.00. Conference Close
Keynote speakers

Biographies and talk information

Professor Anne Schilder, ENT surgeon and NIHR Research Professor, leads the evidENT team at UCL dedicated to developing high quality clinical research and promote evidence based management of ENT, Hearing and Balance conditions. She is professor of Paediatric ENT at UCL's Ear Institute, Royal National Throat, Nose and Ear Hospital and University Medical Centre Utrecht, as well as Visiting Professor at Oxford University. She is an expert in clinical trials; her RCTs in the field of upper airway infections in children have influenced how global health-care systems think about the management of these conditions and have been translated in evidence-based guidelines and health policies. Her evidENT team brings together clinicians and researchers across the UK. evidENT works with patients, charities, industry and nother stakeholders to ensure patients benefit from new and better treatments and to learn how to improve ENT, Hearing and Balance services for the future. Her talk is entitled: Scientific evidence within the clinical context.

Trevor Cox is Professor of Acoustic Engineering at Salford University where he is a researcher and teacher in acoustics, signal processing and perception, and renowned for his media work, documentaries and communicating to the general population as well as to students. He has won prestigious awards from the Institute of Acoustics of which he is a former President. He has written many books, including Sonic Wonderland: A Scientific Odyssey of Sound and a substantial body of scientific literature and research articles. His talk is entitled:

The Acoustics Behind Sonic Wonderland
Sonic Wonderland is a popular science book about the most remarkable sounds in the world. This talk will look at some of the detailed acoustic science behind a few of the wonders, picking examples that required first hand research in preparing the book. It will include solving the mystery of Echo Bridge, something that first appeared in the Journal of Acoustical Society of America in the 1940s. The talk will include measurements on the badly tuned musical road in California. To finish, the talk will outline a search for places with excessive reverberation time. This will include the vast oil tank in Scotland where Trevor broke the Guinness World Record for the longest 'longest echo'. The author returned to the tank this spring to play the saxophone, and he will reveal what it is like to play in a space with a reverberation time of 75 seconds.

Stefan Launer has been Vice President Science & Technology of Sonova since April 2008 and joined the Management Board in April 2013. He started his professional career at Phonak in 1995 in the Research and Development department where he held various functions. Today he is in charge of managing the basic science and technology programs in various fields of hearing health care, the development of core technologies and intellectual property rights. Stefan Launer studied Physics at the University of Würzburg and in 1995 was awarded a PhD from the University of Oldenburg on
modeling auditory perception in hearing impaired subjects. His talk is entitled:

**Hearing Systems in a connected world.**

Over the last two decades hearing instruments have turned into intelligent systems offering a range of different algorithms for addressing listening needs in specific acoustic environments. More recently modern hearing systems are becoming wirelessly connected to each other to form body area networks. These ear to ear connections allow applying new features such as binaural signal processing techniques to improve communication in complex listening conditions. A second class of applications allows connecting hearing systems to external audio sources such as phones, remote microphones, TV, audio players etc. Today ear to ear wireless links allow to apply binaural signal processing mimicking the way the auditory system processes sounds binaurally. These algorithms can offer significant benefit in various difficult listening conditions beyond the performance of classical noise reduction and directional microphone systems. The second class of systems is particularly designed to improve communication over larger distances eg school environments. A third set of applications of wireless connectivity is to offer new approaches to service delivery and new fitting approaches to hearing impaired people. In this talk I want to present the state of the art of hearing instrument technology and discuss future perspectives of the new technology trends.

Todd A. Ricketts, Ph.D, CCC-A, FAAA, is an associate professor and the Director of Graduate Studies, Department of Hearing and Speech Sciences at the Vanderbilt Bill Wilkerson center for Otolaryngology and Communication Sciences; and, Director of the Dan Maddox Hearing Aid Research Laboratory. Todd has published more than 100 scholarly articles and book chapters. To date he has presented over 300 scholarly papers, poster presentations, short courses, mini-seminars, and workshops both nationally and internationally. He continues to pursue a federally and industry funded program studying various aspects of hearing, hearing aids and cochlear implants. He was named a Fellow of the American Speech Language and Hearing Association in 2006 and his article "Directional benefit in simulated classroom environments" received the Editors award from the American Journal of Audiology at the 2008 AHSA convention. He also is a past editor-in-chief of the quarterly journal Trends in Amplification, a current associate editor for the Journal of Speech, Language and Hearing Research and the past chair of the Vanderbilt Institutional Review Board. His talk is entitled: **Speech recognition and spatialisation in complex listening environments: effects of hearing aids and processing.**

Corné Kros is Professor of Neuroscience at the University of Sussex. Noted for his seminal studies of cochlear hair cell physiology, in particular the properties of spontaneous activity in pre-hearing inner hair cells and the process of mechanoelectrical transduction by which these cells detect sound, Professor Kros's research is at the forefront of basic science in hearing. His current interests lie in the effects of aminoglycoside antibiotics on hearing, and the development of blocking agents that might prevent aminoglycoside-induced damage to the hair cells. His talk is entitled:
Adventures in mammalian mechanotransduction: adaptation, aminoglycosides and anomalous currents

C.J. Kros*, §Sussex Neuroscience, School of Life Sciences, University of Sussex, Brighton, UK, §ENT Department, University Medical Center Groningen, Groningen, The Netherlands

Hearing requires sound being transduced into electrical signals in the brain. The key step in this mechano-electrical transduction (MET) occurs in about a hundred ion channels atop each of the auditory hair cells in the cochlea (Kros et al, 1992). Gated by tip links between adjacent stereocilia in the hair bundles these MET channels, when open, allow current flow from the endolymph into the hair cells, depolarizing them. Just two degrees of hair bundle deflection open 90% of the channels (Géléoc et al, 1997) to encode the loudest sounds. An adaptation process dependent on influx of Ca\(^{2+}\) ions through the MET channels keeps the hair cells optimally sensitive to small changes in sound intensity, and has been extensively studied in hair cells from lower vertebrates. Recent evidence suggests that in mammalian auditory hair cells adaptation is similarly Ca\(^{2+}\) dependent and rapid, with Ca\(^{2+}\) acting at or near the MET channel itself (Corns, Johnson, Kros & Marcotti, in preparation).

The unusual characteristics of ion permeation through the MET channels, favouring the entry of Ca\(^{2+}\) ions by a vestibule at the extracellular side of the pore, also makes the cells vulnerable to ototoxic damage by aminoglycoside antibiotics such as gentamicin and dihydrostreptomycin. The aminoglycosides enter hair cells through the MET channels and are effectively trapped once inside (Marcotti et al, 2005). We are currently screening for compounds that compete with the aminoglycosides for entry into the hair cells, as a potential means to reduce the ototoxicity of these otherwise clinically useful drugs.

Heretically, MET currents with unusual properties can be found under a variety of conditions in which tip links are absent (Marcotti et al, 2014). These large currents occur predominantly in response to stimuli of the opposite polarity to those that generate normal MET currents and have slower kinetics. The underlying ion channels appear to lack the vestibule of the normal MET channels and may be MET channel precursors situated at the base of the stereocilia.

Acknowledgements

Work in the Kros lab is supported by the MRC.

References


Symposium abstracts

From hair cells to hearing abstracts

The sensory hair cell in normal hearing and disease
D.N. Furness. Institute for science and technology in hearing, Keele University.

Hair cells are the sensory receptor of our hearing and balance systems. Their ability to detect mechanical stimuli caused by sound and head movements is based on a structure at their tops called the hair bundle, composed of a precisely organised array of minute hairs (called stereocilia). This bundle, as well as being physically highly sensitive, for instance to high impact sounds or certain drugs, is the target of a number of genetic abnormalities which underlie conditions such as Usher syndrome and other hearing impairments. One of the principal targets in Usher syndrome is the tip link, a structure found within the hair bundle that is composed of dimers of two molecules, cadherin 23 and protocadherin 15. Another common hearing impairment is associated with one of the candidate proteins for the hair-cell transducer channels, TMC1. Mouse mutations in these proteins have revealed much about how defects in them cause hearing loss by targeting the hair bundle and affecting both its structure and its ability to detect mechanical stimuli.

Coding of acoustic information in the auditory pathway
Professor Alan R. Palmer, Director, MRC Institute of Hearing Research, University Park, Nottingham, NG7 2RD, UK.

As a result of the mechanical action of the basilar membrane and transduction in the cochlear hair cells, responses of auditory nerve fibres are tuned like a series of overlapping band pass filters allowing a good representation of the frequency content of any sound, which becomes less clear at high levels as the filters broaden. Activity in the auditory nerve signals the frequency content, the timing and the sound level of the sounds. Pathways from the first brainstem nucleus (the cochlear nucleus) converge in the brainstem to allow combination of information from the two ears for analysis of the location of the sound source, which is then sent to the auditory midbrain. Pathways from the cochlear nucleus also send information about the sound spectrum and its pitch directly to the auditory midbrain where it is integrated with inputs from all lower brainstem nuclei, before sending the information on to the auditory cortex via the thalamus. The auditory cortex has several frequency mapped areas which process sounds in parallel. There is some evidence for processing of different aspects of sounds in different cortical areas, giving rise to suggestions of different anatomical and functional processing streams for different aspects of sound perception. The deeper layers of the cortex send projections back down the auditory pathway enabling the cortex to modulate the ascending flow of auditory information.

Integrating acoustic and electric information following cochlear implantation
P.T. Kitterick. NIHR Nottingham Hearing Biomedical Research Unit, Nottingham, UK

A cochlear implant evokes neural activity in the auditory nerve by delivering a train of electric pulses into the cochlea via a micro-electrode array. The amplitude of the pulses at each electrode is modulated by an externally-worn speech processor to encode the temporal envelope of sound energy within a particular frequency band. A unilateral cochlear implant provides sufficient temporal and spectral information to support speech understanding at
favourable signal-to-noise ratios, and bilateral cochlear implants provide access to inter-aural level cues which can support sound source localisation.

Traditional candidates for cochlear implantation in the UK have a bilateral profound hearing loss. Thus, their listening abilities following implantation primarily reflect access to the electric signals from the implant. However, some UK recipients may have access to residual acoustic hearing at low frequencies, and recipients in other healthcare systems are being implanted with increasing levels of residual acoustic hearing in the non-implanted ear.

While patients with well-preserved access to residual acoustic hearing report subjective differences in quality between the electric and acoustic signals, benefits arising from simultaneous access to both signal modalities have been demonstrated using tests of speech perception and localisation. Vocoder studies with normal-hearing listeners suggest that additional benefit may be obtained if electric and acoustic information is delivered to neural populations with similar characteristic frequencies in each ear.

Acknowledgements
Supported by infrastructure funding from the National Institute for Health Research.

Listening difficulties and auditory processing disorder (APD) in children: proposed mechanisms
D.R. Moore* * Communication Sciences Research Center, Cincinnati Children’s Hospital and Department of Otolaryngology, University of Cincinnati, Ohio, USA; § School of Psychological Sciences, University of Manchester.

Developmental APD is sometimes diagnosed for children presenting with listening difficulties (LiD), but normal audiograms, who score poorly on tests mostly of speech perception. However, most children with LiD, whether or not diagnosed APD, have difficulties with cognitive functions, also associated with other learning disorders. Here, I discuss two possible mechanisms underlying LiD/APD in children (see also Moore, 2014), first, that some children have ‘suprathreshold’ hearing loss, and second, that cognitive insufficiency may be modelled by dichotic listening. A link with cochlear deficiencies is suggested by (i) impaired temporal perception (e.g. frequency discrimination), which may indicate impaired phase locking in the brainstem, (ii) peripheral processing abnormalities (e.g. acoustic reflexes, MOC inhibition), found in some children with LiD, (iii) children with auditory neuropathy, without hearing loss, can also have LiD/APD. Dichotic listening, used frequently to diagnose APD, is also used in cognitive neuroscience to study executive function, strongly and specifically implicated in LiD/APD. By comparing the ‘free recall’ of dichotic CV syllables with ‘forced attention’ to right or left ear, Hugdahl (2009) has discovered a fronto-parietal network involved in top-down attention regulation of bottom-up auditory processing in individuals with learning disorders. We are currently examining this network in children with LiD/APD.

References
PPC symposium Abstract

HOW YOU CAN MAKE AUDIOLOGY BETTER.
A symposium by the BSA Professional Practice Committee.

You, the audiological professional, are fundamental to the development of best clinical practice within the UK and you have an obligation to ensure that others in both your and allied professions benefit from your knowledge, experience and ideas. Whether a student, recently qualified or are following a career in audiology, you can make a significant contribution to making audiology better.

The principle aim of the BSA is the advancement of Audiology. This not only includes the scientific study of hearing and balance function and other related sciences, but also, as importantly, the advancement of best clinical practice in the diagnosis, management and rehabilitation of hearing and balance and allied disorders.

The development and promotion of good clinical Audiological practice at all stages of care by the BSA is facilitated by its Professional Practice Committee which provides and disseminates guidance on good practice which is demonstrably high on relevance, quality and impact. This guidance is achieved through the provision of recommended procedures, guidelines, minimum training standards and training days.

As part of the ongoing process to optimise the impact of the BSA, the PPC is in the process of submitting an application to NICE for accreditation of its guidance. This symposium will include a presentation by Deborah Collis, Associate Director of Accreditation and Quality Assurance for NICE, who will be speaking about the accreditation process and its potential benefits.

This symposium will demonstrate the key role that you should be playing in the development and promotion of good Audiological practice and discuss how this may best be achieved in order to have greatest impact. This will include exploring ways by which you can effectively engage in and contribute to the process of making audiology better.

UK Biobank symposium abstract

Large scale hearing studies using the UK Biobank resource

P. Dawes¹, H. Fortnum², D.R. Moore²,³, R. Emsley⁴, P. Norman⁵, K. Cruickshanks⁶, A.C. Davis⁷, M. Edmondson-Jones², A. McCormack², Robert Pierzicki² and K.J. Munro¹,⁹

¹ School of Psychological Sciences, University of Manchester, UK, ² NIHR Nottingham Hearing Biomedical Research Unit, Nottingham, UK, ³ Cincinnati Children’s Hospital Medical Center, Cincinnati, USA, ⁴ Centre for Biostatistics, Institute of Population Health, University of Manchester, UK, ⁵ School of Geography, University of Leeds, UK, ⁶ Population Health Sciences and Ophthalmology and Visual Sciences, School of Medicine and Public Health, University of Wisconsin, USA, ⁷ Central Manchester Universities Hospitals NHS Foundation Trust, UK

The UK Biobank is a large data set established for investigations of the genetic, environmental and lifestyle causes of diseases of middle and older age. Over the course of 2006-2010, 503,325 UK adults between the ages of 40 to 69 years were recruited. Participants responded to questionnaire measures of lifestyle and demographic factors, performed a range of physical measures and donated biological samples. A subset of 164,770
participants completed a hearing test (the Digit Triplet Test, a measure of speech recognition in noise). During 2012 to 2013, 17,819 participants completed a repeat assessment, including 4,425 participants who completed the hearing test at both time points.

A multi-disciplinary team including researchers from Manchester, Nottingham, Leeds, Cincinnati and Wisconsin have been collaborating to analyse hearing and tinnitus data from the UK Biobank. In this symposium, we report the first analyses, including i) an overview of patterns of hearing impairment and hearing aid use, ii) cigarette smoking and alcohol consumption as risks for hearing loss, iii) relationships between speech recognition in noise, audiometric thresholds and cognitive performance and iv) how associations between cognitive performance and hearing loss may be mediated by hearing aid use and social isolation.

Acknowledgements
This research was based on data provided by UK Biobank. Additional support was provided by the National Institute of Health Research (Nottingham Hearing BRU and Manchester BRC), the Medical Research Council, and Cincinnati Children’s Hospital. DRM was supported by the Intramural Programme of the Medical Research Council [Grant U135097130]. KJC was supported by R37AG11099, R01AG021917 and an Unrestricted Grant from Research to Prevent Blindness. The Nottingham Hearing Biomedical Research Unit is funded by the National Institute for Health Research. This paper presents independent research funded in part by the National Institute for Health Research (NIHR). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health. This research was facilitated by Manchester Biomedical Research Centre. This research was conducted using the UK Biobank resource.

Special Interest Group Session Abstracts

APD

BSA Auditory Processing Disorder SIG update: Onwards and Upwards
N.G. Campbell* and D.R. Moore§, *Institute of Sound and Vibration Research, University of Southampton, UK, §Communication Sciences Research Center, Cincinnati Children's Hospital, Cincinnati, USA

Over the past 3 years the SIG has shaped international thinking. We published a peer-reviewed Position Statement and Practice Guidance Document (2011), and an ‘APD White Paper’ (2013) in the International Journal of Audiology. We initiated and collaborated with the American Academy of Audiology (AAA) to present very successful global APD days as part of the AAA conferences in Boston (2012) and in Orlando (2014). Since 2011, and our call for evidence based practice, there has been a surge in the number of randomised control studies. Finally, we hosted an APD Satellite Day at the 2013 BSA Annual Conference. This presentation reviews those past achievements and new and future developments in tests, resources and technology, and our new APD Position Statement and Practice Guidance Document. In our revised approach, the parcellation into Developmental, Acquired and Secondary APD, which has proven useful and popular, is retained. For Developmental APD, we emphasize the goal of management of children, with a more hierarchical approach to testing and diagnosis. Assessment starts with questionnaires, followed by testing; where-after individuals are guided towards various interventions that suit their specific needs. Theoretic underpinnings become more biological and, therefore, testable, preventable or treatable.
Acknowledgements
We acknowledge the anonymous reviewers, members of the BSA Professional Practice Committee and all that took part in the public consultation for the Position Statement and Practice Guidance Document. We further acknowledge the commentaries of the leading international researchers that formed part of the BSA ‘APD White Paper’.

References

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The Video Head Impulse Test and its relationship to caloric testing
SL. Bell*, F. Barker, §, E.Mackenzie*, H.Hesleton*, C.Parker*, A.Sanderson*, *Hearing and Balance Centre, University of Southampton UK, § Windsor ENT, Berkshire

The subjective Head Impulse Test (HIT) (Halmagyi and Curthoys, 1988) was proposed to indicate the status of the vestibular occular reflex (VOR) at high frequencies. It relies on direct observation of the eyes whilst rapid short duration impulses are applied to the subject’s head. The presence of overt saccades are an indirect indication of peripheral abnormality in the canal being stimulated. The Head Impulse Test tests the VOR at higher frequencies than the caloric test (Jorns-Haderli et al., 2007). However it relies on the detection of overt saccades by the observer. The video Head Impulse Test (vHIT) MacDougall et al. (2009) has been developed as an alternative system suitable for routine clinical use to make head impulse testing more objective. The system consists of software and lightweight goggles containing both an eye position camera that can track the subject's pupils, and a gyroscope that can track the angular movement of the head. The system records head impulse velocity, together with eye movement velocity in response to high velocity impulses that are applied to the head by the clinician. Impulses can be applied in the three planes of the semicircular canals. During this test the head is moved with acceleration that should be sufficient to cause the afferents of the semicircular canal on one side to be completely inhibited. Hence a semicircular canal on one side can be tested in effective isolation from the same canal on the other side

This study has two aims: To explore normative ranges for vHIT gain and to compare the results of vHIT testing with calorics in a sample of patients attending a clinic for balance disorder. Two normative studies were conducted to explore the normal ranges of vHIT gain in different semicircular canals. A clinical sample of 51 patients (20 male, 31 female) were tested with both lateral canal vHIT and air calorics.
Normative studies found that vHIT gain is near unity for lateral canals, but is significantly raised in the vertical canals. Care must be taken to avoid artefacts when recording from the vertical canals.

vHIT gain appears relatively insensitive to peripheral vestibular disorder as indicated by caloric testing, with low sensitivity but fair specificity. vHIT gain is abnormal in canals with no measurable function. The vHIT does not appear well suited to screen and identify patients who require caloric testing although the test may give complementary information to caloric testing.

Declaration of interest
The author reports no conflicts of interest. The authors alone are responsible for the content and writing of the presentation.

References

Motivational approach to behaviour change in vestibular rehabilitation to improve clinic attendance
N. Topass, Audiology Department, Royal Surrey County Hospital, UK

This study aims to compare how the use of a motivational approach to behaviour change would improve patient clinic attendance and thus therapy adherence. Vestibular rehabilitation is the recommend primary treatment for stable vestibular lesions (Shepard et al, 1995). The prognosis for uncompensated peripheral vestibular lesions is generally very good with the percentage of patients who dramatically or completely improve set at 90% (Shepard et al, 1995). Adherence to vestibular rehabilitation programs can however prove to be difficult as is the case in many chronic health conditions.

An important part of learning a new behaviour is for the patient to identify and acknowledge the value of the new behaviour (Konle-Parker, 2001). Motivational interviewing is a counselling technique which has been developed to help a patient to explore and resolve ambivalence related to behaviour change (Emmons & Rollnick, 2001).

A review of our clinic attendance was compiled to determine the efficacy of the customised vestibular rehabilitation program. The data was reviewed in terms of: attendance, did not attend(DNAs); and cancellation history for the six month period from September 2012 to February 2013. The percentage of DNA’s was 12.6% and the late cancellation rate was 15.4% (A late cancellation is made within 1 week of the appointment). A review of current literature revealed that patient motivation may be a key element to the high DNA rate for this particular speciality, thus a motivational approach to the patient pathway was introduced. The patient would then ‘opt in’ or ‘opt out’ of the therapy. The therapy program also included elements referred to as the ‘box’, the ‘line’ and the ‘circle’.

The results of the change in protocol was assess for the period from September 2013 to February 2014. The percentage of DNA’s was then 4.7% and the patient late appointment
cancellation rate was 4.7%. The conclusion is thus that a motivational approach to vestibular rehabilitation delivery can improve clinic adherence and thus patient adherence to therapy.

Acknowledgements
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References
Tønnesen H. 2012. Engage in the process of change: Facts and methods, WHO-CC Clinical Health Promotion Center Bispebjerg University Hospital Copenhagen, Denmark Health Sciences Lund University, Sweden

Sponsor workshops

**Monday 1st September at 2 PM: Oticon (Alison Stone)**

14:00 – 14:30 Evidence for a new compression strategy for children
14:45 – 15:15 New clinical tools for paediatric fittings
15:25 – 15:45 Connectivity for Kids

**Monday 1st September at 4.15 PM: Interacoustics**

Title TBA

**Tuesday 2nd September at 11 AM: The Tinnitus Clinic**

**Mark Williams: Tinnitus Pathophysiology and Evolving Clinical Options for Therapy.**

The investigation of tinnitus neural correlates within mammals has enabled the development of novel therapeutic approaches that strive to reduce or reverse pathological central changes in humans afflicted with bothersome auditory hallucinations. This talk will review the pathophysiology of subjective tinnitus and introduce evolving therapeutic intervention options.

**Tuesday 2nd September at 2 PM : GN Resound**

Paul Leeming, Support Audiologist