

CAA Canadian Academy of Audiology Heard. Understood. October 15th to 18th, 2014 Fairmont Chateau Whistler Whistler, BC

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Letter from the Conference Comittee Co-Chairs

On behalf of the Conference Organizing Committee, we are honoured and delighted to welcome you to the 17th installment of the annual meeting of the Canadian Academy of Audiology in stunning Whistler, British Columbia! The conference is Canada's largest annual event dedicated to the science and practice of audiology, and it gives participants the opportunity to learn about the most recent advancements in hearing and balance science, share best practices, reacquaint with colleagues and old friends, establish new connections, and shape the direction of audiology in Canada.

There are few highways in the world with as much awe-inspiring scenery as the Sea-to-Sky highway – what a fantastic way to begin this year's conference. Nestled at the base of Blackcomb Mountain, the meeting takes place at the landmark Fairmont Chateau Whistler; an ideal setting for CAA 2014.

The education program for the conference features an array of recognized leaders in audiology from across the globe who are eager to share their latest research findings and perspectives. Opening the conference, Dr. Dave Fabry will review the transforming retail landscape in audiology, with discussion topics to include the on-going shift away from "mom and pop" hearing clinics to chains and the role (or threat as some see it) of personal sound amplifiers (PSAPs). Dr. Fabry is an amazing and dynamic speaker and has been a respected industry leader for over two decades. Day 2 begins with Dr. Theresa (Terry) Chisolm discussing the benefits and limitations of evidence-based audiology when designing individual patient plans. Dr. Chisolm exemplifies what it means to be an educator and researcher, and her dedication and enthusiasm for audiology is sure to inspire. Day 3 will begin with a plenary presentation by Dr. Kelly Tremblay on the aging brain and the aging auditory system. Dr. Tremblay excels at conducting translational research that is clinically relevant, and has published over 80 peer-reviewed articles. This year there are two exciting pre-conference workshops with teams of world class presenters: A) Tinnitus Principles and Practice and B) Revolutionizing Audiologic Rehabilitation Using Approaches from Health and Social Psychology to Facilitate Adjusting to and Living with Hearing Loss.

In addition to our power-packed lineup of plenary and session speakers, there is the world-class trade show and exhibit hall, the poster and podium sessions, and the silent basket auction (the proceeds of which fund the Clinical Science Award). Wednesday evening opens with a Welcome Reception, on Thursday night there is the Exhibitors' Wine and Cheese reception featuring a "Sticky Fly" fundraiser for the student honourarium. Not to be missed, the "Whistler Tasting Tour" takes place on Friday night and features amazing cuisine from some of Whistler's top chefs.

As the conference co-chairs, we recognize that the success of the conference critically depends on a dedicated team. We are grateful for the contributions from our amazing Executive Director Jean Holden and Administrative Assistant Kathryn Knight together with David, Marianne and the team from Meeting Management Services (MMS). Our special thanks also go to Philippe Fournier and Angela Weaver for the various contributions. We are also grateful for the energy and efforts of our student volunteers.

Our conference would not be possible without the ongoing support of our sponsors and exhibitors who are acknowledged within this program.

In closing, on behalf of the Board of Directors and Conference Committee of the Canadian Academy of Audiology, we wish you a top-notch and memorable conference experience. Welcome to Whistler!

Gurjit Singh, Ph.D., Aud(C), Reg. CASLPO Barb Bentley, Au.D., Reg. CASLPO

Program -October 15th to 18th, 2014

Wednesday, October 15th

10:00 am – 7:00 pm Frontenac Foyer	Conference Registration
11:00 am – 5:00 pm Frontenac A	 Pre-Conference Workshop A Tinnitus: Principles and Best Practice Glynnis Tidball Richard Tyler Carol Bauer
11:00 am – 5:00 pm Frontenac B	 Pre-Conference Workshop B Revolutionizing Audiologic Rehabilitation Using Approaches from Health and Social Psychology to Facilitate Adjusting to and Living with Hearing Loss Kathy Pichora-Fuller Gaby Saunders Paul Mick Gurjit Singh Arlene Carson Ariane Laplante-Lévesque
1:00 pm – 2:00 pm Frontenac C	Pre- Conference Lunch
3:30 pm – 3:45 pm Frontenac C	Pre-Conference Refreshment Break
5:00 pm – 6:00 pm Empress C	Student Meeting & Reception
5:30 pm – 7:00 pm Frontenac ABC & Foyer	Welcome Reception

Thursday, October 16th

8:00 am – 6:00 pm Frontenac Foyer	Registration	12:30 pm – 1:00 pm Frontenac Foyer	Members AGM Registration
9:00 am - 11:00 am Frontenac ABC	Session 1 Opening Keynote Avoiding commoditization of Audiology in the hearing aid distribution process • Dave Fabry	1:00 pm – 2:30 pm Frontenac ABC 3:00 pm – 4:15 pm	President's Lunch and AGM Concurrent Afternoon Sessions
11:00 am - 11:15 am Frontenac Foyer	Break, Posters, and Networking Opportunities	Frontenac A	Session 5 Tinnitus Retraining Therapy – Evidence for Efficacy • Carol Bauer
11:15 am - 12:30 pm Frontenac A	Concurrent Morning Sessions Session 2 The Role of the Audiologist in the Interventional Audiology Movement	Frontenac B	Session 6 What Every Audiologist Needs to Know About Autism Spectrum Disorders (ASD) • Gail Whitelaw
Frontenac B	 Brian Taylor Session 3 Auditory Processing Disorders in Children David Moore 	Frontenac C	Session 7 The Hearing Loss Epidemic: Implications for Healthy Aging • Paul Mick
Frontenac C	Session 4 Outcome Measures: What can they tell me that my patient can't? • Gaby Saunders	4:15 pm – 6:45 pm MacDonald Foyer	Exhibitor Reception

Friday, October 17th

8:00 am - 6:00 pm Frontenac Foyer	Registration	3:00 pm – 4:15 pm Frontenac A	Concurrent Afternoon Sessions <mark>Session 9</mark> Everything I know about Hearing Loss – Part 1
9:00 am – 10:30 am Frontenac ABC	Session 8 Plenary Presentation Evidence-Based Audiology: Benefits and Limitations for Your Patient's Intervention Plan • Theresa Chisolm	Frontenac B Frontenac C	• Mead Killion Session 10 Podium Sessions Session 11 Use of the Extended Speech Intelligibility Index (ESII) and the Hearing In Noise Test (HINT) to Quantify Functional Hearing Ability
10:30 am – 3:00 pm Macdonald BCDE	Exhibit Hall	4:15 pm – 5:30 pm	• Sig Soli Concurrent Afternoon Sessions
10:30 am – 10:45 am Macdonald BCDE	Morning Refreshment Break in Exhibit Hall	Frontenac A Frontenac B	Session 12 Everything I know about Hearing Loss – Part 2 • Mead Killion Session 13 Management of Older Adults with Hearing
12:15 pm – 1:15 pm Macdonald BCDE	Lunch in the Exhibit Hall		Loss and Dual Sensory Loss: Insights from the Blue Mountains Hearing Study and Dual Sensory Loss Study in Australia • Catherine McMahon
1:30 pm – 2:30 pm Macdonald Foyer	Poster Presentations and Evaluations	Frontenac C	Session 14 Communicating Audiologic Findings in the Medical Setting • Virginia Ramachandran

Saturday, October 18th

8:00 am – 2:00 pm Frontenac Foyer	Registration	12:15 pm – 1:15 pm	Buffet Lunch			
9:00 am – 9:05 am Frontenac ABC	Poster Award Presentation					
9:05 am - 10:30 am Frontenac ABC	Session 15 Plenary Presentation Aging Ears and the Aging Brain: Information about the Brain for the Clinician • Kelly Tremblay	1:30 pm – 2:45 pm Frontenac A	Concurrent Afternoon Sessions Session 19 Early Spoken Language Development Following Pediatric Cochlear Implantation: Direct Comparison of Nen tonal (English) and Tonal			
10:30 am – 10:45 am Frontenac Foyer	Morning Break and Networking Opportunity		• Sig Soli			
10:45 am – 12:00 pm Frontenac A	Concurrent Morning Sessions Session 16 Hearing Restoration: A Surgical Perspective • Jane Lea	Frontenac B	Session 20 Occupational Hazards of Delivering Health Care: Stress and Burnout • Kathy McGilton			
Frontenac B	Session 17 Hyperacusis and Misophonia in Clinical Practice • Glynnis Tidball	Frontenac C	Session 21 Assessing the Impacts of Age, Hearing Loss, and Brain Injury on Central Auditory Function • Erick Gallun			
Frontenac C	Session 18 The Life of the Inner Ear • Sumitrajit Dhar					

Abstracts

Pre-Conference Workshop A

Tinnitus: Principles and Best Practice

Glynnis Tidball; Richard Tyler; Carol Bauer

Wednesday, October 15th, 2014 | 11:00 am - 5:00 pm | Frontenac A

Knowing what to say and how to help patients find the right solution to manage tinnitus is a challenging area of audiologic practice, one that often requires more time and expertise than many of us feel able to provide. Patients turn to us for answers to their tinnitus questions: "Why do I hear this noise in my head? What pill can I take to stop it? Why did my physician tell me I need hearing aids when it's the tinnitus that makes it hard to hear? And what about this treatment from Germany I read about?" We bring out our hearing instruments. Which one is best? How do we program hearing aids for tinnitus? Are hearing aids sufficient to manage tinnitus? What do I do if the patient has mental health issues? Acronyms float in our head: What about TRT? PTM? CBT? MBSR? Where do we send patients who need more than what we can offer?

This pre-conference workshop will provide participants with an up-to-date review of the theoretical and clinical aspects of tinnitus care. Topics covered will include models of tinnitus mechanisms and generation, medical management of tinnitus, current and prospective treatment and management options, and the best practice guidelines based on current evidence and clinical experience. We will also discuss how best to direct patients to appropriate resources for funding and multidisciplinary care. Learning objectives:

- Provide patients with current theoretical and evidence-based information on tinnitus and its management
- Provide patients with tools and strategies to effectively manage tinnitus
- Direct patients to appropriate resources for funding and specialized care

Pre-Conference Workshop B

Revolutionizing Audiologic Rehabilitation Using Approaches from Health and Social Psychology to Facilitate Adjusting to and Living with Hearing Loss *Kathy Pichora-Fuller; Gaby Saunders; Paul Mick; Gurjit Singh; Arlene Carson; Ariane Laplante-Lévesque*

Wednesday, October 15th, 2014 | 11:00 am – 5:00 pm | Frontenac B

Many individuals with hearing loss not seek or get the help they need to function well in everyday life and achieve their quality of life aspirations. Health and social psychology approaches have been effective used in programs for people living with a wide range of other chronic health conditions. Applying these approaches, audiologists may be able to reduce delays in help-seeking, predispose and accelerate readiness for action-taking, support behavior change by the person and communication partners, and design follow up to maintain benefits and prevent relapse. Part 1 of the workshop will familiarize audiologists with health psychology models of behavior change that are inspiring new approaches to audiologic rehabilitation. Pichora-Fuller will introduce the general concepts and Saunders and Laplante-Levesque will examine the application in audiology of the Health Belief Model and the Stages of Change Model. Part 2 will showcase illustrations of what the new AR revolution might look like if the application of a health psychology approach were more widely adopted to address the many unmet needs of people who are hard of hearing. Carson, Singh and Mick will explore re-framing hearing health care with emphasis on social support, community involvement and interprofessional efforts to promote healthy aging.

Learning objectives:

- Learners will be able to explain the Health Belief Model and the Stages of Change Model with examples from audiologic rehabilitation.
- Learners will be able to explain how hearing loss may be related to other health issues.
- Learners will be able to develop plans for bolstering the engagement of family and community members in providing social support for people who are hard of hearing.

Session 1 - Opening Keynote

Avoiding Commoditization of Audiology in the Hearing Aid Distribution Process Dave Fabry

Thursday, October 16th, 2014 | 9:00 am - 11:00 am | Frontenac ABC

Commoditization has been cited as one of the greatest risks for any healthcare provider in the 21st century. Essentially, technology threatens to usurp the role of the clinician, unless professional expertise is valued as a differentiating factor on outcome. This session will review the current situation with regards to hearing instrument dispensing, and discuss threats and opportunities for the Audiology. Topics will include internet and PSAP sales, threats from "Big Box" stores and third-party payment, and the emergence of the Baby Boomer generation as the dominant patient population for hearing instrument sales. Audience participation is strongly encouraged. Learning Objectives:

- Participants will learn about conventional and alternative distribution pathways for hearing instrument sales in North America.
- Participants will discover threats and opportunities for the Audiology by focusing on enchantment, rather than mere satisfaction, for patient outcomes.
- Participants will identify strategies for focusing on the Baby Boomer generation with regards to hearing aid.

Session 2

The Role of the Audiologist in the Interventional Audiology Movement

Brian Taylor

Thursday, October 16th, 2014 | 11:15 am - 12:30 pm | Frontenac A

There is a growing awareness in the role hearing loss of adult onset has on public health, long term wellness and healthy aging. This concept is commonly referred to as interventional audiology. This course will review the relationship between hearing loss, healthy aging and public health. The clinical audiologist's role in this emerging healthcare system, and the opportunities for practices to position themselves as the pillar-of-community with respect to these trends, will be discussed.

Healthy aging is best described as the ability to maintain optimal health as we age. In other words, looking and feeling like you are 45, even though your chronological age might be over 80. We now have some of the first well-designed longitudinal studies suggesting there is a systematic pathway through which age-related hearing loss contributes to accelerated declines in the cognitive and physical functioning of older adults. Through this line of research we are beginning to understand that age-related hearing loss may actually accelerate some disabilities such as cognitive dysfunction and vestibular impairment. The prevalence, co-morbidity and disabling effects of hearing loss underscore the need for aggressive preventive programs that identify conditions such as hearing loss which threaten health outcomes in some of the other areas, such as quality of life, physical functioning and even earning potential.

Additionally, interventional audiology may require the profession of audiology to create new and novel ways to deliver clinical services. This may necessitate a "back to the roots" strategy in which tools such as aural rehabilitation, auditory training and motivational interviewing are combined with new technology like smartphone apps to create value for younger patients with milder degrees of hearing loss.

Learning Objectives:

- Operationalize the age-related, co-morbidity research presented in this seminar so that you may attract more patients to your practice and successfully address their needs •
- Describe the public health significance of age-related hearing loss and its relationship to healthy aging.
- Discuss comprehensive hearing rehabilitation strategies for adults of all ages and how they may be implemented in a private practice
- Consider how to engage with other health care professions to raise awareness on issues related to hearing loss and healthy aging.

Session 3 Auditory Processing Disorders in Children David Moore

Thursday, October 16th, 2014 | 11:15 am – 12:30 pm | Frontenac B

Auditory processing disorders (APD) may be broadly defined as listening difficulties in the absence of hearing loss. It has been reasoned that, because the cochlea functions normally, APD must arise through malfunction of the central nervous system. In several professional society position statements, APD has been considered primarily a problem of sensory, 'bottom-up' processing. This is the way the central auditory nervous system (CANS) codes, transforms and interprets neural signals arising from the cochlea and involved in simple (e.g. temporal processing) and complex (e.g. speech perception in noise) auditory tasks. However, increasing evidence over the last 5 years suggests that impaired performance on these same tasks may primarily reflect 'top-down' modulation of auditory perception by multimodal cognitive systems including attention, memory and learning. A third perspective is that both sensory and cognitive processes are involved in all aspects of hearing, and that they cannot be segregated. Most current clinical tests for APD involve language-based testing that necessarily involves brain mechanisms beyond the CANS. An important professional issue is whether audiologists can or should test for these higher-level functions. Recent findings suggest that, while most APD is primarily top-down, impaired temporal processing in the cochlea and brainstem may also be involved. Learning objectives:

- Convey brief history, presentation, and hypothesized nature of developmental APD.
- Discuss more general interaction between hearing, listening, cognition and language.
- Ask whether APD could result from a newly discovered 'hidden hearing loss', a mild form of auditory neuropathy.

Session 4

Outcome Measures: What can they tell me that my patient can't?

Gaby Saunders

Thursday, October 16th, 2014 | 11:15 am – 12:30 pm | Frontenac C

While most audiologists acknowledge the value of measuring hearing aid outcomes, remarkably few routinely do so. The reasons are somewhat understandable – a lack of time during clinic visits, an overwhelming choice of measures, and possibly uncertainty as to what to do with the data once they are collected. In order to address some of these issues, practical ways in which measurement of hearing aid outcomes can be used to enhance evidence-based practice will be described. This will be done within the framework of the World Health Organization's International Classification of Functioning, Disability and Health (ICF) because the ICF provides a rationale for assessing outcomes measurement in different domains. As a result, audiologists will be able to more knowledgeably select the most appropriate measure(s) for the purpose at hand. Specific examples of outcome measures in each outcome domain will be described and evidence demonstrating their value in clinical practice will be presented. It is the goal of this presentation to convince the audience of the value or even necessity of measuring hearing aid outcomes for every hearing aid fitting and to suggest ways in which this can be achieved in a time- and cost-efficient manner. Learning Objectives:

- List three reasons for routinely measuring hearing aid outcomes
- Select outcome measures appropriate for the task at hand
- List two behavioral and two self-report hearing aid outcome measures

Session 5

Tinnitus Retraining Therapy – Evidence for Efficacy

Carol Bauer

Thursday, October 16th, 2014 | 3:00 pm – 4:15 pm | Frontenac A

There is a significant clinical need to develop effective therapies to treat chronic bothersome tinnitus. The incidence and prevalence of chronic debilitating tinnitus is increasing, primarily because of noise-exposure in recreational and military settings. Although there is a long history of using counseling and sound therapy to treat tinnitus, there have been few clinical trials investigating the efficacy of these interventions. Factors impacting clinical trials include use of appropriate controls, the placebo effect, metrics with sufficient sensitivity and specificity to detect clinically relevant improvement, and limited funding for tinnitus research. In consequence, there has been little advancement in the clinical science of applied tinnitus treatments in recent years. Tinnitus retraining therapy has been popularized worldwide, although the evidence for treatment efficacy has been restricted to Levels 3, 4 and 5 data. The scientific rationale for treating chronic tinnitus with counselling and acoustic stimulation will be presented. The technique of tinnitus retraining therapy (TRT) as proposed by Jastreboff and Hazell will be reviewed. (Continued)

The challenges inherent in investigating treatment efficacy using valid, well-controlled trials will be presented. Finally, data from two clinical trials investigating the effect of tinnitus re-training therapy on chronic tinnitus will be presented.

Learning Objectives:

- At the conclusion of this presentation, learners will understand the basic elements of tinnitus retraining therapy.
- Learners will be familiar with the challenges inherent in conducting valid clinical trials that assess treatment efficacy for chronic tinnitus.
- Learners will have increased knowledge of current outcomes data comparing TRT with standard of care aural rehabilitation

Session 6

What Every Audiologist Needs to Know About Autism Spectrum Disorders (ASD)

Gail Whitelaw

Thursday, October 16th, 2014 | 3:00 pm - 4:15 pm | Frontenac B

Currently estimates by the Centers of Disease Control and Prevention indicate that 1 in 68 children are identified as having an autism spectrum disorder (ASD). Based on these demographics,

audiologists are certainly involved in the evaluation and treatment of children with ASD and their families. In some cases, the audiologist will be the first professional to evaluate a child with ASD due to initial concerns regarding communication. In other cases, the audiologist will be involved in providing information regarding about hearing and how this impacts the child's communication abilities. Dual diagnosis of hearing loss and ASD must also be considered. This session is designed to address the major aspects of working with children with ASD, with a focus on providing practical suggestions with this population. A brief overview of current diagnostic criteria will be provided. Myths and facts regarding hearing and listening behaviors will be discussed and evidenced based research will be provided to support clinical approaches. Specific approaches that will enhance the amount information that is obtained during the assessment will be presented. Treatment recommendations will be discussed. Research on parental perceptions regarding hearing loss and ASD will be presented to help guide counseling with this population.

Learning objectives:

- List current diagnostic criteria for ASD and describe how these criteria may impact audiologic assessment of children
- Describe modifications that will maximize the ability to obtain accurate audiologic data in children with ASD
- Discuss audiologic treatment criteria and options for children with ASD

Session 7

The Hearing Loss Epidemic: Implications for Healthy Aging *Paul Mick*

Thursday, October 16th, 2014 | 3:00 pm – 4:15 pm | Frontenac C

Age-related hearing loss (ARHL) is emerging as a major global public health concern. Estimates suggest that by 2030, as life expectancies rise and populations age, ARHL will be responsible for more worldwide disability than all but 8 other medical conditions, affecting hundreds of millions of people. Recent evidence has demonstrated associations between ARHL and declines in psychosocial, cognitive and functional health outcomes. Studies have also shown a link between ARHL and early mortality. It is still unclear if hearing loss or confounding factors are causing the observed declines in health. The possibility is raised, however, that treating hearing loss might improve health and lengthen life.

In the first part of the talk, I will outline the rising prevalence and public health burden of ARHL and discuss contributing factors. In the second part, the results and limitations of research linking hearing loss and psychosocial, cognitive, psychiatric, and functional health outcomes will be discussed. The impact of these conditions on healthy aging will be described from the individual and societal perspectives. Finally, I will discuss current and potential solutions to the ARHL epidemic, including future research needs. There will be ample time for discussion with and among the audience.

Learning objectives:

- Its increasing prevalence and public health burden
- The association between hearing loss and psychosocial, cognitive, psychiatric and functional health outcomes
- Current and potential solutions to the age-related hearing loss epidemic at the individual and societal levels

Session 8 - Plenary Presentation

Evidence-Based Audiology: Benefits and Limitations for Your Patient's Intervention Plan

Theresa Chisolm

Friday, October 17th, 2014 | 9:00 am - 10:30 am | Frontenac ABC

In this era of evidence-based care, emphasis is placed on the importance of randomized controlled trials for demonstrating treatment efficacy. While critical to improving the evidence-base for audiology intervention, randomized trials alone cannot provide all the relevant information that clinicians need to determine the best treatment of individual patients. In this presentation the results of RCTs – one examining the efficacy of auditory training for adults and the other focused on hearing aids, will be examined in order to highlight the strengths and limitations of RCTs in providing information needed for decision-making about individual patients. Approaches to developing "patient-centered evidence" which takes into account individual differences and preferences for guiding clinical care will be discussed. (Work supported, in part, by VA Rehabilitation Research and Development Grants #C6303R and #C6028R). Learning Objectives:

- Participants will be able to describe the critical elements of a well-controlled randomized controlled trial
- Participants will be able to identify the role of RCTs in patient-centered care.
- Participants will be able to describe how to utilize evidence from an RCT with consideration of a patient's individualized goals and preferences in clinical decision-making.

Session 9 Everything I know about Hearing Loss - Part 1 Mead Killion

Friday, October 17th, 2014 | 3:00 pm - 4:15 pm | Frontenac A

Causes of diplacusis, threshold loss, SNR loss, hidden loss with detached terminals will be discussed in context of the AI and a Magic Formula that takes all these into account. The last half of session 2 will include a brief review of brain rewiring and the importance of the dispenser's non-technical skills in providing a good hearing aid fitting. Learning objectives:

- Causes of various forms of hearing loss
- Method for predicting intelligibility in various situations from a single formula and AI dots
- Why the placebo effect is often more important than the medicine.

Session 10 Podium Sessions

Friday, October 17th, 2014 | 3:00 pm – 4:15 pm | Frontenac B

Session 11

Use of the Extended Speech Intelligibility Index (ESII) and the Hearing In Noise Test (HINT) to Quantify Functional Hearing Ability Sig Soli

Friday, October 17th, 2014 | 3:00 pm – 4:15 pm | Frontenac C

The Extended Speech Intelligibility Index (ESII) is used to predict the speech reception thresholds (SRT) in real-world fluctuating noise environments (Rhebergen et al., 2008). For individuals with normal hearing the SRT is typically -2.6 dB S/N and the ESII is about 0.34. Thresholds above the norm indicate that a larger ESII is needed to achieve the same level of intelligibility. This relationship between the ESII and HINT threshold elevation can be used to quantify the impact of threshold elevation on functional hearing ability, especially speech communication, in real-world noise environments.

Elevation of a HINT threshold above the norm increases the ESII criterion value and thus reduces the likelihood of effective communication. For example, a 1 dB threshold increase corresponds to an increase in the ESII of approximately 0.03. Using this relationship, it is possible to make quantitative estimates of the impact of threshold elevation on the likelihood of effective communication during hearing-critical activities on the job and, in so doing, to establish and validate hearing screening criteria for specific jobs and workplaces. The results of this effort will be reported.

Learning objectives:

- Understand the Extended Speech Intelligibility Index (ESII) and how it is calculated
- Understand the relationship between ESII and speech reception thresholds
- Understand how the ESII can be used to calculate the likelihood of effective speech communication in real-world noise environments
- Understand how this likelihood can be used to define quantitative measures of an individual's ability to perform hearing-critical job tasks in real-world noise environments

Session 12

Everything I know about Hearing Loss - Part 2 *Mead Killion*

Friday, October 17th, 2014 | 4:15 pm - 5:30 pm | Frontenac A

Causes of diplacusis, threshold loss, SNR loss, hidden loss with detached terminals will be discussed in context of the AI and a Magic Formula that takes all these into account. The last half of session 2 will include a brief review of brain rewiring and the importance of the dispenser's non-technical skills in providing a good hearing aid fitting. Learning objectives:

- Causes of various forms of hearing loss
- Method for predicting intelligibility in various situations from a single formula and AI dots
- Why the placebo effect is often more important than the medicine.

Session 13

Management of Older Adults with Hearing Loss and Dual Sensory Loss: Insights from the Blue Mountains Hearing Study and Dual Sensory Loss Study in Australia

Catherine McMahon

Friday, October 17th, 2014 | 4:15 pm – 5:30 pm | Frontenac B

Adult-onset hearing loss is typically diagnosed and managed several years after onset, often, after leading to multiple negative consequences including effects on employment, depressive symptoms and increased risk of mortality. While hearing aids are associated with reduced depression, longer life expectancy and retention in the workplace, several studies show high levels of unmet need for hearing health services in older adults and poor use of prescribed hearing aids, in cases leading to their abandonment. The population-based Blue Mountains Hearing Study (BMHS), a longitudinal study of older adults of a representative older Australian community sample, which commenced in 1992, provides key information about prevalence, incidence, modifiable risk factors, comorbidities and mortality risk associated with age-induced hearing loss as well as hearing aid ownership and use. BMHS data showed that dual sensory loss is more prevalent in the older population and is associated higher mortality risk than a single sensory loss. Combined with separate systems of health care and poor recognition in health policy, we assumed that this would result in poorer management of this vulnerable population. Therefore, we piloted a hearing screening and educational model (HSEM) targeting individuals from a low vision clinic and referring those with unmet hearing needs to appropriate services. In this presentation we provide data from both studies and discuss implications for policy and practice. (Continued)

Learning Objectives:

- Understand the associations between age-related hearing loss, depression, mortality risk and the major factors which contribute to the cost to society.
- Understand some of the key similarities and differences in hearing loss prevalence, hearing aid use and the delivery of hearing healthcare for older adults in Australia, the UK and USA.
- Identify some limitations in the current models of hearing health care.
- Understand some of the influences on decision-making for older adults to seek help for hearing loss.

Session 14

Communicating Audiologic Findings in the Medical Setting

Virginia Ramachandran

Friday, October 17th, 2014 | 4:15 pm – 5:30 pm | Frontenac C

With the advent of the electronic medical record and changes in communication modalities, methods of conveying audiologic information have evolved. In addition, criteria for documentation continue to change over time. This presentation will include the rationale for and distinction between reporting and documentation. The latest evidence to support effective communication among healthcare providers will be discussed, as well as strategies for implementation in the audiology clinic.

Session 15 - Plenary Presentation

Aging Ears and the Aging Brain: Information about the Brain for the Clinician *Kelly Tremblay*

Saturday, October 18th, 2014 | 9:05 am - 10:30 am | Frontenac ABC

In this presentation, behavioral and electrophysiological research on auditory and cognitive aging will be described as it applies to issues in adult audiological rehabilitation, including hearing aids, training and counseling. Specifically, a focus will be how aging impacts the quality of the 'bottom-up' signal such that amplification or implantation may not be sufficient to yield accurate perception.

Learning Objectives:

- Understand that hearing loss impacts the way sound is encoded in the brain.
- Understand why hearing technology helps to improve signal audibility but does not guarantee improved speech understanding.
- Identify ways you can include information about the brain when counselling patients.

Session 16

Hearing Restoration: A Surgical Perspective

Jane Lea

Saturday, October 18th, 2014 | 10:45 am - 12:00 pm | Frontenac A

A broad overview of surgical procedures available to restore hearing will be discussed including candidacy criteria. Topics covered include tympanoplasty, ossicular reconstruction, bone anchored hearing systems and cochlear implantation.

Learning objectives:

- To provide an overview of surgical procedures to restore hearing in the setting of conductive hearing loss.
- To provide an overview of surgical procedures to restore hearing in the setting of sensorineural hearing loss.
- To review the candidacy criteria for hearing restoration procedures.

Session 17

Hyperacusis and Misophonia in Clinical Practice

Glynnis Tidball

Saturday, October 18th, 2014 | 10:45 am - 12:00 pm | Frontenac B

Decreased sound tolerance is a common complaint among tinnitus patients and one that may develop with or without hearing loss. Hyperacusis, here defined as the discomfort from moderately intense sounds, and misophonia, a strong aversive reaction to sounds, can cause significant distress in patients. Patient distress is often heightened by lack of understanding or validation by healthcare professionals. In the audiology setting, hyperacusis and misophonia can result in lowered tolerance of test stimuli and can complicate instrument fitting. Patients with decreased sound tolerance may find amplification intolerable and sound generators for tinnitus therapy aggravating. This session will focus on the clinical presentation of hyperacusis and misophonia, possible mechanisms and triggers, assessment, comorbid contributors to hyperacusis and misophonia and treatment options. Learning Objectives:

- Identify patients with hyperacusis and misophonia and modify assessment accordingly
- Provide educational counselling to patients presenting with hyperacusis and misophonia
- Tailor management of patients to accommodate hyperacusis and misophonia

Session 18

The Life of the Inner Ear

Sumitrajit Dhar

Saturday, October 18th, 2014 | 10:45 am - 12:00 pm | Frontenac C

Otoacoustic emissions are sounds generated in the ear and have long been accepted to be an outcome of the amplification process in the cochlea. However, the cellular mechanisms responsible for their generation, their modulation by efferent input, and possible modes of their backward propagation to the ear canal are still being debated. Current knowledge in these domains will launch our discussion about these faint sounds generated in the inner ear.

Significant advances have recently been achieved in delivering accurate signals to the human ear canal for the evaluation of the entire hearing range up to 20 kHz. These methods are currently being leveraged to evaluate hearing thresholds and otoacoustic emissions across this wide frequency range. The effect of age on these estimates of auditory function are revealing trends in aging not evident before. The use of objective measures in detecting early signs of aging and chemotoxicity will be discussed from dual perspectives. Results from a large-scale study will be used to trace the trajectory of otoacoustic emissions across a significant portion of the human lifespan. In parallel, individual case studies will be used to illustrate the power of stable measurements in tracking auditory function in individuals.

Learning Objectives:

- Attendees will be able to identify complexities in presenting high frequency signals with accuracy to the eardrum.
- Attendees will be able to evaluate the role of ultra high frequency hearing thresholds in detecting age related changes to human hearing.
- Attendees will be able to differentiate between otoacoustic and threshold changes as a result of aging.

Session 19

Early Spoken Language Development Following Pediatric Cochlear Implantation: Direct Comparison of Non-tonal (English) and Tonal (Mandarin) Language Development

Sig Soli

Saturday, October 18th, 2014 | 1:30 pm – 2:45 pm | Frontenac A

A primary goal of our research has been the development, validation, and use of practical clinical assessment tools for objective evaluation of speech and language development in children with hearing aids and/or cochlear implants. A hierarchically structured assessment battery has been developed and is now in use. This presentation will describe the assessment battery, focusing primarily on the study of early language development. Receptive and expressive vocabularies were measured with the Simplified Short Form (SSF) version of the Mandarin Communicative Development Inventory (MCDI) in a sample of 112 pediatric implant recipients at baseline, 3, 6, 12, and 24 months after implantation. Implant ages ranged from 1-5 years. Scores were expressed in terms of normal equivalent ages, allowing normalized vocabulary growth rates to be determined. Scores for English-speaking children reported by Niparko et al. (2010) were also re-expressed in these terms, allowing direct comparisons of Mandarin and English early spoken language development. Results showed that effects of implant age and duration of implantation can be compared directly across languages using normalized vocabulary growth rates. (Continued)



Such comparisons for Mandarin and English revealed closely comparable results, despite the diversity of these languages, underscoring the universal role of plasticity in the developing auditory system.

Learning objectives:

- Understand methods for assessment of early language development
- Understand how simplified measures of language development have been adapted for practical clinical use
- Understand the concepts normal equivalent age and normalized vocabulary growth rate, as used to characterize early language development
- Understand how these concepts can be used to directly compare early language development in different cultures and languages

Session 20

Occupational Hazards of Delivering Health Care: Stress and Burnout

Kathy McGilton

Saturday, October 18th, 2014 | 1:30 pm - 2:45 pm | Frontenac B

Burnout is a potential reality for all health care professionals. The term "burnout" was coined 40 years ago to describe a state of exhaustion and frustration experienced by health care workers upon whom excessive demands are placed. Multiple factors such as workload, fatigue and work-life imbalance, have been found to affect burnout among audiologists. Factors contributing to burnout for audiologists will be considered and compared to recognized predictors of burnout for other health care professionals. Strategies to modify individual and organizational factors contributing to burnout used by other professional groups will be examined. The potential usefulness and applicability of these strategies to reduce burnout for audiologists and enhance the quality of work life of attendees will be discussed.

Learning Objectives:

- At the end of the presentation, participants will be able to:
- Identify the predictors of burnout common across health care disciplines and specific to audiologists
- Describe strategies that reduce burnout and contribute to professional quality of work life

Session 21

Assessing the Impacts of Age, Hearing Loss, and Brain Injury on Central Auditory Function *Erick Gallun*

Saturday, October 18th, 2014 | 1:30 pm - 2:45 pm | Frontenac C

Communication in a complex auditory environment can be impaired for a variety of reasons, but one the questions that most concerns our laboratory is whether or not the central nervous system is impaired. Two lines of research will be discussed, one involving current and former members of the U.S. armed services who were exposed to high-intensity explosions in the line of duty, and the other involving Veteran and non-Veteran listeners experiencing normal age-related changes in auditory sensitivity. In both studies, the ability to perform complex auditory tasks are shown to be impacted both by peripheral and central dysfunction. The challenges related to distinguishing among the various factors will be discussed, but the emphasis of our research is identifying the types of diagnostic tests most sensitive to central dysfunction and to developing new tests that can be used to bring such evidence to the clinic. Recent work on developing a new headphone-based test of spatial hearing that simulates listening in a multitalker spatial environment will be highlighted. Learning Objectives:

- Attendees will be able to describe the central auditory processing pathways.
- Attendees will be able to discuss ways in which central auditory dysfunction can impair communication
- Attendees will be able to describe a range of diagnostic tests sensitive to central auditory dysfunction.

Podium Abstracts

2014 CAA Conference: Poster Presentation

Friday, October 17th, 2014 from 3:00pm – 4:15pm in room Frontenac B

Please note below the order of the podium sessions.

1. A survey of audiologists' preferences for patient centeredness

Ariane Laplante-Lévesquea,b, Louise Hicksonc and Caitlin Grennessd

- ^a Eriksholm Research Centre, Oticon A/S, Denmark
- ^b University of Linköping, Sweden

^c University of Queensland, Australia

^d University of Melbourne, Australia

Background: Patient-centredness is becoming a core value of health services worldwide, however it remains largely unexplored in audiology.

Objectives: This study investigated audiologists' preferences for patient-centredness and identified factors that explain audiologists' preferences for patient-centredness.

Methods: All members of the Audiological Society of Australia received two questionnaires by mail: (1) a descriptive questionnaire (e.g. age, gender, place of residence, years in practice, employment setting), and (2) a modified patient-practitioner orientation scale (PPOS; Krupat et al, 2000) which measures preferences for two aspects of patient-centredness, sharing and caring. In total 663 (46%) audiologists returned both questionnaires fully completed.

Results: Mean PPOS scores indicated that audiologists prefer patient-centredness. Linear regression modelling identified that older audiologists, that had practiced longer, and that were employed in a public setting had a significantly greater preference for patient-centredness than their peers.

Conclusions: Audiologists prefer client-centredness and age, years of experience, and employment setting can partly explain preferences for patient-centredness. Future research should explore patients' preferences for patient-centredness as well as the relationships between patient-centredness and intervention outcomes in audiology.

2. The auditory and linguistic skills of French-speaking children with school-based learning problems living in an English-speaking region

Bigras, Jacynthe; Lagacé, Josée; Breau-Godwin, Stéphanie; Savard, Jacinthe; Fleuret, Carole & Martini, Rose.

University of Ottawa

Objectives: The aim of this study is to examine motor, auditory and linguistic skills in a group of French-speaking children experiencing school-based learning problems and living in the Ottawa region (Ontario), where English is the predominant language of the population.

Background: In Canada, it is estimated that 10 to 15% of school-aged children are experiencing learning problems in school. Many of these children show developmental delays in many areas, such as language, information processing, motor abilities, etc. The identification of the conditions responsible for learning difficulties is usually done through an elimination process, which can be lengthy. Few studies have attempted to capture group and individual trends in language, motor and auditory information processing development.

Methods: Forty children from 8 to 12 years old with school-based learning problems participated in this study. Standardized measures of language achievement, auditory and visual processing abilities, and motor function were administered to participants.

Results: Among all the measures performed, deficits in the linguistic skills and the auditory processing abilities are the most frequent.

Conclusions: Preliminary results suggest that a significant proportion of French-speaking children living in the Ottawa region and who are experiencing school-based learning problems show delay in the development of their linguistic and auditory processing abilities. It is hoped that the results of the study will contribute to the development of a decision tree that will allow professionals to identify children's difficulties early, as well as provide direction for intervention.

3. Is there a relationship between speech ABR measures and performance on a word-in-noise-test in 6 years old French-speaking children?

Isabelle Mineault-Guitard, Pascale Barry-Cossette, Stéphanie Breau-Godwin et Josée Lagacé

University of Ottawa

Objectives: The aim of this study was to investigate a possible correlation between speech ABR results and the performance on a word-in-noise test measured in six years old children. **Background:** Children with language development problems and children with auditory processing disorder have similar speech recognition performance in background noise. It is difficult to determine if the underlying cause of their hearing difficulties is related to language or auditory deficits. On the other hand, it is widely acknowledged that electrophysiological measures provide information about the sequence, timing, and location of neural events involved in auditory processing. Several studies of the brainstem encoding of speech sounds have revealed that the specific characteristics of the acoustic signals are maintained and are reflected with an impressive precision in the subcortical pathways. For example, a number of studies using speech signals have shown that the neural encoding of the speech stimulus /da/ is compromised in individuals with abnormal language, reading and learning abilities. Motivated by these findings, we wanted to investigate the relationship between children's performance on a word-in-noise test and the speech-evoked ABR components.



Methods: Twenty children six years of age (n=20) with normal pure tone hearing thresholds participated in this study. Speech recognition in noise was tested with the Test de Mots dans le Bruit (TMB; Lagacé, 2010). Speech-evoked ABR were measured using a recording of the syllable /da/ graciously provided by the Nina Kraus Laboratory. The behavioural and physiological measures were conducted separately in two different quiet and empty classrooms.

Results and conclusions: The data will be presented with some interpretations about the relationship between brainstem function and speech perception in noise performance. This study contributes to further the knowledge regarding the usefulness of brainstem response as a quantifiable measure of the neural encoding of speech sounds.

4. Working memory in children: Implications for auditory comprehension

Jessica Sullivan

University of Washington

Objectives: 1) Identify the role of underlying processes (e.g. working memory) involved in speech recognition and comprehension in noise. 2) Establish a framework to developing intervention to improve speech recognition in noise based on our finding. We believe working memory could be an important component in understanding the variability of speech understanding in noise.

Background: Despite the adult-like development of the sensory peripheral auditory system in children have difficulty with more complex listening tasks such as speech recognition in noise and auditory comprehension. One explanation for this difficulty is the simultaneous development of higher-order cognitive processes such as auditory working memory. Working memory is the temporary storage and processing of information while other cognitive tasks are being performed. It is the implicit assumption that individuals have different working memory capacities and can be affected differently by extrinsic factors such as noise.

Methods: Children with and with hearing loss between the ages of 7 to 10 were administered working memory, speech recognition in noise, and comprehension task in quiet and noise in a series of studies.

Results: Performance on auditory working memory and comprehension tasks were significantly poorer in noise than in quiet. The relationship between auditory working memory and comprehension was stronger in noise than in quiet, suggesting an explicit role of working memory. In addition, further examinations of the types of errors made by children indicate that the effect of noise is closely related to increase processing demands.

Conclusions: These data suggest that school-aged children's auditory working memory and comprehension are negatively affected by noise. Performance on comprehension in noise is strongly related to demands placed on working memory, supporting the theory that degrading listening conditions draw processing resources away from the primary task. Implications for intervention will be discussed.

5. Literacy achievement of Deaf learners with cochlear implants

Dr. Connie Mayer ,Dr. Pamela Millett

Faculty of Education, York University

Objectives: To examine phonological processing, reading and writing abilities of a cohort of school-aged, Canadian children with cochlear implants and compare performance to that of hearing peers.

Background: As growing numbers of deaf children are receiving cochlear implants (often bilaterally and before the age of 12 months), studies of literacy development are essential to establish whether predictions for age-appropriate literacy outcomes as a consequence of enhanced access to auditory input, are being achieved. There is a particular scarcity of Canadian outcome data.

Methods: Research was conducted in a large urban school board in Ontario. Data were collected from 64 students (mean age 9 years, 2 months, range from 5 years, 4 months to 19 years, 3 months). The majority (58) used spoken language, and 6 used spoken language with sign support. There were no exclusion criteria; all students with cochlear implants were included irrespective of age of implantation, placement, achievement level, home language, or additional disabilities. Five subtests of the Woodcock-Johnson Diagnostic Reading Battery-III [WJ III-DRB] (Woodcock, Mather & Schrank, 2004) and six subtests of the Comprehensive Test of Phonological Processing [CTOPP] (Wagner, Torgensen & Rashotte, 1999) were administered to assess phonological processing and reading. Uncorrected written language samples were also collected and analyzed.

Results: Findings indicate that 67% of students performed in the typical range for hearing learners (within 1 standard deviation of the mean), 55% performed in the typical range for phonological awareness, and 60% for phonological memory. Data analysis of individual subtest performance, relationships between outcome measures, and qualitative analysis of writing samples will also be discussed.

Conclusions: These are encouraging results and speak to the need to systematically track literacy development to determine the extent to which these learners achieve age-appropriate outcomes, to consider reasons why some continue to face challenges, and to reflect on implications for intervention.

6. Use non-sedated ABR test for adults with cognitive and memory impairment

Li Qi, Ph.D., R.Aud

Vancouver General Hospital, Vancouver, BC

Objective: To evaluate feasibility of using a non-sedated Auditory Brainstem Response test for adults with cognitive and memory impairment



Background: Research has shown that traditional audiological tests are not appropriate for adult with cognitive or memory impairment due to lack of cooperation, short attention/memory issues. Sedated Auditory Brainstem Response test might be needed; however, it is rarely used due to associated costs and risks. An effective and reliable audiological assessment is needed for adults with cognitive and memory impairment in order to preserve and enhance their quality-of-life.

Methods: A retrospective case review was performed. 5 adult patients with cognitive and memory impairment were identified. Standard and play audiometry were attempted first; however, test reliability was poor, reportedly. Non-sedated tone-evoked Auditory Brainstem Response tests were performed at 500 and 2000 Hz for both ears on these 5 patients when they were awake. Different intensity levels were used to determine which levels generate detectable V wave responses.

Results: Tone-evoked ABRs were completed on 4 patients for both ears at 500 and 2000 Hz. One patient could not tolerate insert earphones. Published research has shown that estimated ABR threshold in nHL are typically higher than behavioral thresholds (HL), the correction value is subtracted to provide a better estimate of behavioral hearing thresholds (Stapells, 2000).

Conclusions: This study suggested a non-sedate ABR test might be an appropriate approach to assess hearing thresholds for adults with cognitive and memory impairment. Further study with a large number of subjects is needed.

Reference: Stapells, D.R. (2000), Threshold estimation by the tone-evoked auditory brainstem response: A literature meta-analysis. Journal of Speech-Language Pathology and Audiology, 24(2). 74-83.

7. Acoustic analysis of Mandarin retroflex sounds processed with and without noise reduction Foong Yen Chong1,2, M.Sc, & Lorienne M. Jenstad1

1 University of British Columbia.

² Universiti Kebangsaan Malaysia (National University of Malaysia).

Objective: The aim of this study is to determine the acoustic effects of single-microphone noise reduction (SMNR) on Mandarin retroflex fricative and affricates.

Background: SMNR is used in hearing aids to suppress background noise. Most SMNR studies have used English speech materials. However, no study has investigated the effects of SMNR on the acoustics of Mandarin affricates and fricatives that are not in the English phonemic inventory. Constituting half of Mandarin consonants, affricates and fricatives play an important role in Mandarin.

Methods: Sets of speech-plus-noise signals were presented to, and recorded from, a behind-the-ear hearing aid (Phonak Solana M H20) mounted on KEMAR under SMNR-on and SMNR-off conditions. The hearing aid was set to provide linear gain for moderate to moderately-severe hearing loss. Two listening programs were configured with SMNR enabled in one program and disabled in the other. Omnidirectional microphone mode was activated and all other advanced signal processing features were disabled. The speech signals were retroflex affricates and fricatives in vowel-consonant-vowel format concatenated into word strings; the noise was pink noise. Speech was extracted from the recordings after processing using the Inversion Technique (Hagerman & Olofsson, 2004). Long-term and short-term acoustic measurements were performed on the retrieved-speech signals processed with and without SMNR.

Results: The Hearing Aid Speech Quality Index (Kates & Arehart, 2010) measurement showed that the envelope modulation and long-term spectra of speech stimuli processed with and without SMNR were essentially unchanged. Short-term analysis revealed that frication noise amplitude was reduced in the SMNR-on condition.

Conclusions: Acoustic analysis of SMNR-processed stimuli suggests that some implementations of SMNR have measurable short-term acoustic effects on Mandarin retroflex fricative and affricates. Future research will test whether the acoustic effects will affect perception of Mandarin fricatives and affricates in noise among naive listeners. (293 words) **References:**

Hagerman, B., & Olofsson, Å. (2004). A method to measure the effect of noise reduction algorithm using simultaneous speech and noise. Acta Acustica United with Acustica, 90(2), 356-361.

Kates, J. M., & Arehart, K. H. (2010). The hearing-aid speech quality index (HASQI). Journal of the Audio Engineering Society, 58(5), 363-381.

Poster Abstracts

2014 CAA Conference: Poster Presentation

Friday, October 17th, 2014 from 1:30pm – 2:30pm in the Macdonald Foyer outside the Exhibit Hall.

Poster award presentation for Outstanding Student Poster Award (*): Saturday, October 18th, 2014 at 9:00am in the Frontenac ABC Conference Hall.

Poster Placement Assignments:

1. The effects of multilingualism on auditory brainstem evoked potentials*

Koravand, A.¹, Côté, D.¹, Mac-Clinton, E.¹ & Soueidan, PL¹

¹Audiology and Speech-Language Pathology Program, University of Ottawa, Ontario, Canada

Background & Objectives: The purpose of this study is to use auditory stimulation to explore the Auditory Brainstem Response (ABR) in individuals who speak more than one language. ABR can be measured in reaction to simple or more complex sounds.

We are interested to further our knowledge of the way the central auditory system of monolinguals and multilinguals reacts in favorable and non-favorable listening conditions (Noisy sitution)

Method: Data collection is in progress. A total of 60 young adults aged between 18-25 years are invited to participate in this study. 20 monolinguals (anglophones or francophones), 20 bilinguals as well as 20 multilinguals are participating in this study.

ABR will be recorded using verbal, consonant-vowel syllable (da), (complex sounds) and nonverbal stimuli (clicks).

Expected Results: Timing and magnitude analyses will be conducted to describe brainstem neural activity to speech in quite and noisy conditions. These types of analyses consist of studying rapid temporal changes (Temporal Analysis) and complex spectral distributions (Frequency Analysis). Similar pattern of brain-stem responses to click sound would be obtained in three groups of participants. However, different pattern of responses to speech sound would be observed among the groups indicating faster and/or more efficient auditory processing. The Speech-ABR would be considered as a neurophysiological marker identifying central auditory processing efficiency in participants having different language experience

2. Bonebridge implantation: Outcome measures in performance and quality of life

K. Williams^{1,2}, V. Lin^{1,2}, L. Smith^{1,2}, Jafri Kuthubutheen^{1,2,3}, J. M. Nedzelski^{1,2}, Rebecca Vanderelst¹, Samidha Joglekar¹, Gloria Camacho¹, J. M. Chen^{1,2} ¹Sunnybrook Health Sciences Centre, Otolaryngology, Toronto, ONTARIO, Canada; ²University of Toronto, Otolaryngology, Toronto, ONTARIO, Canada. ³University Of Western Australia, Perth, Australia

Objectives: To present early Bonebridge test results.

Background: The Bonebridge is an active, transcutaneous bone-conduction auditory prosthesis for patients with conductive or mixed hearing loss and single-sided deafness. It reduces skin-related issues of percutaneous devices.

Methods: Nineteen patients were implanted with the Bonebridge device, twelve of which had conductive or mixed hearing loss and seven had single-sided deafness.

Assessment included audiometry and Hearing In Noise Test (HINT) measurements. Patients completed The Hearing Utility Index Mark 3 (HUI-3), the Speech, Spatial and Quality of Hearing Scale (SSQ), the Tinnitus Handicap Inventory (THI) and the Bern Benefit in Single Sided Deafness (BBSS) questionnaires.

Patients were assessed pre-implantation and 1 and 6 months post-activation.

Results: HINT Outcomes: SNR improvement from 1 to 6 months post-activation in the speech at implant side and noise at 0 degrees azimuth' condition, ranging from 2.24 to 4.94 dB. Speech And Functional Gain: Average aided word recognition score at 60 dB was 96% (24% unaided); average functional gain at PTA4 was 38 dB; average functional gain was 20 dB at 6000 Hz and 25 dB at 8000 Hz.

THI Outcomes: Tinnitus improvement was noted from pre-implantation to 1 month post-activation. The 'Functional' subcategory revealed statistically significant improvements from pre-implantation to 1 and 6 months post-activation (36.46 to 25.00).

HUI-3 Outcomes: Mean utility improvements were statistically significant from pre-implantation to 1 and 6 months post-activation (.63 to .82 and .85).

SSQ Outcomes: Speech Hearing Scale: statistically significant mean improvements from pre-implantation to 1 and 6 months post-activation (4.41 to 6.62 and 7.07); Spatial Rating Scale: statistically significant improvements from pre-implantation to 6 months post-activation (2.19 to 5.17); Sound Qualities Rating Scale: statistically significant improvements from pre-implantation to 1 and 6 months post-activation (4.59 to 7.81 and 7.20).

Conclusions: Bonebridge implantation is an effective option for those with appropriate indications. Benefits are significant in reducing tinnitus perception, improving SNR, and enhancing health-related quality of life measures.

3. Language acquisition of cochlear implant recipients in bilingual environments*

Brendan McDonald

School of Communication Sciences & Disorders, Western University, London, ON

This systematic review details the findings of a literary search into the ability of children with cochlear implants to acquire language in bilingual environments. The goal of this review is to better understand how well cochlear implant users acquire multiple languages and what factors affect development.

Cochlear implants transduce auditory signals to electrical impulses; these signals are dynamically different than the original acoustic input. Pediatric implant recipients learn to make sense of these electrical signals and from them develop spoken language—a challenging task given the complex nature of speech. Acoustic cues used in spoken language vary widely—prosody, stress patterns, & phonology are all part of the puzzle when learning a new language. A child's capacity to develop language relies on their ability to both perceive and produce these linguistic qualities. Acquiring one language is difficult enough; this challenge increases when adding a second (or third) language into the mix.

The objective of this review is to investigate language development in oral and sign-oral bilingual environments. Factors such as language assessment tools, implantation age, and research quality were included in the evaluation of oral and sign-oral bilingual literature in assessing the level of language development of these children. Data extraction and quality assessment tools were used to evaluate the literature.

Results show that there is quality of evidence for normal developmental outcomes of oral bilingual children, and some, but limited, quality of evidence for similar outcomes with sign- oral bilingual children. The literature stresses that speech therapy in bilingual settings is crucial in allowing successful transference of linguistic skills. Although there are still unexplored barriers and factors of language acquisition with cochlear implants, the quality of evidence found in this review lends strong support of normal language acquisition in both types of bilingual environments.

4. Effect of noise on the relation between auditory working memory and comprehension for children with normal hearing*

Homira Osman, PhC.¹, Jessica R. Sullivan, PhD.¹, Erin C. Schafer², PhD.

¹ University of Washington - Seattle, Department of Speech & Hearing Sciences.

² University of North Texas, Department of Speech & Hearing Sciences.

Objectives: The objective of the study was to examine the effect of complex noise on the relationship between auditory working memory and comprehension in school-aged children. **Background:** Children are especially vulnerable to the negative effects of background noise. A child's ability to understand speech in noise is associated with language, literacy, psychosocial development, and academic progress. No assessments are available to evaluate the higher auditory and cognitive demands placed on a child in the classroom. Yet, most classrooms today fall short of the recommended signal to noise ratio (SNR) of +15, and have SNRs that range from -7dB to +4dB. Given that learning often occurs in noisy environments, tasks that require greater engagement of working memory resources are especially at risk in noise.

Methods: Twenty children with normal hearing between the ages of 8 to 10 (mean age 9; 0, SD.76) participated. The backward digit recall and listening recall tests of working memory were administered in two conditions (quiet and noise at -5 dB SNR). In addition, children were asked to answer a set of questions after listening to narratives. Each question evaluated a particular listening behavior that falls within one of the five subtests: main idea, details, reasoning, vocabulary, and understanding messages.

Results: Performance on auditory working memory and comprehension tasks were significantly poorer in noise than in quiet. The reasoning, details, understanding, and vocabulary subtests were particularly affected in noise (p < .05). The relationship between auditory working memory and comprehension was stronger in noise than in quiet, suggesting an explicit role of working memory.

Conclusions: School-aged children's auditory working memory and comprehension are negatively affected by noise. Performance on comprehension in noise is strongly related to demands placed on working memory, supporting the theory that degrading listening conditions draw processing resources away from a primary task.

5. Could cognitive screening improve the delivery of audiology services to older adults?

Akram Keymanesh¹, Kate Dupuis^{1,2,3}, Marilyn Reed¹, Heather Finkelstein¹, Debbie Ostroff¹, & M. Kathleen Pichora-Fuller^{2,3,4,5}

¹Department of Audiology, Baycrest Health Sciences, Toronto, Ontario, Canada

²Department of Psychology, University of Toronto, Toronto, Ontario, Canada

³Toronto Rehabilitation Institute, University Health Network, Toronto, Ontario, Canada

⁴ Rotman Research Institute, Toronto, Ontario, Canada

⁵Linnaeus Centre HEAD, Swedish Institute for Disability Research, Linköping, University, Linköping, Sweden

Objective: To evaluate the usefulness of cognitive screening in a geriatric audiology practice.

Background: Concurrent cognitive impairment in a hearing impaired individual could influence the provision and success of audiologic rehabilitation. Results from cognitive screening tests may help audiologists better tailor their care to the client's cognitive abilities.

Methods: 47 participants (60% female, Mage=85 years, half first-time hearing aid users), were administered the Montreal Cognitive Assessment (MoCA). Audiologists recommended management and categorized client's cognitive status. Subsequently, they were provided the MoCA results and could revise their recommendation and cognitive categorization. Intervention outcomes were examined at follow up.

Results: Based on the MoCA, 15% of participants scored in the normal range, 40% in the mild cognitive impairment range, and 45% in the dementia range. Audiologists' categorizations agreed with MoCA results for 28% of cases, but in most cases (67%) they estimated cognition to be better than the MoCA category. The audiologists reported feeling very confident in categorizing 24% of cases, but were only somewhat confident for most cases (73%). Importantly, access to MoCA scores increased their confidence such that they became very confident for most cases (58%). Furthermore, 50% of recommendations were revised when the MoCA results were considered, mostly when the MoCA category was poorer than estimated initially by the audiologist. To date, half of the participants have completed follow ups, with high test-retest reliability for MoCA scores. Of note, the majority of individuals who did not try or keep hearing aids were cognitively impaired. However, outcome measures for those who purchased hearing aids did not depend on cognitive status.

Conclusions: These results suggest that it is useful for audiologists to screen cognitive status because this information increased their confidence in evaluating clients and informed management recommendations.

6. Initiating and supporting change on the older adult's journey in hearing healthcare*

Heather Holliday, Lorienne Jenstad, Garnet Grosjean, Barbara Purves all affiliated with University of British Columbia

Objectives: The purpose of this investigation was 1) to evaluate a presentation on Hearing Health in Older Adults and 2) to explore hearing health change from the perspective of older adults.

Background: Age-related hearing loss (ARHL) is a common health problem with wide-spread implications. Despite its common occurrence, wide-spread consequences and effective management options, ARHL is left untreated by the majority of older adults who are affected by it. Understanding the reasons for low uptake of management options can inform how hearing health might be supported.

The term "hearing health change" is used here to encompass any step that a person takes that propels the individual towards improved ability to communicate. Resistance to taking steps towards hearing health change may be due to many factors such as perceptions of susceptibility, benefits, and barriers; self-efficacy and outcome expectations; and, lack of access to appropriate and trusted information (Cox et al., 2005; Egger et al., 1999; Hickson & Scarinci, 2007; Winsor, 2011).

Methods: An information-sharing presentation, Hearing Health in Older Adults, was designed with the seniors' advocacy group Council of Senior Citizens' Organizations of British Columbia (COSCO). The presentation combined participatory action learning, peer teaching, peer learning, and narrative case studies to promote the health literacy of older adults about hearing health. Four minimally-led focus group discussions were held following the COSCO presentation Hearing Health in Older Adults. The data from these discussions were analyzed using the inductive techniques of qualitative description and thematic analysis.

Results: Five central themes emerged under the overarching theme of initiating and supporting change: Recognizing and Admitting hearing loss; Understanding the Options; Sharing Stories and Experiences; Barriers and Facilitators; and Peer Teaching.

Conclusions: The themes that emerged support the use of information-sharing tools and group discussion, such as were fostered with this presentation, to effectively approach the topic of hearing health with older adults.

7. Altered emotional reactivity in tinnitus sufferers

Philippe Fournier (1,2,3,4), Marie-Andrée Cormier (3), Pierre Rainville (2,3,4,5), Sylvie Hébert (1,2,3,4)

(1) School of Speech Language Pathology and Audiology, Université de Montréal, (2) International Laboratory of Music, Sound and Brain Research (BRAMS), (3) Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM), (4) Centre de recherche en Neuropsychologie et Cognition (CERNEC), (5) Stomatology Department, Université de Montréal

It has recently been postulated that the limbic system might be involved in the generation of tinnitus. In this model, tinnitus-related neural activity would be produced by peripheral hearing damage at low levels of auditory system activity and adaptively filtered out via inhibitory connections from limbic regions, thereby preventing the perception of tinnitus. In tinnitus sufferers, altered limbic inhibitory influences would fail to cancel out the tinnitus signal, which would then be transmitted to the auditory cortex and produce tinnitus perception. Accordingly, emotional reactivity should be expected to be altered among affected individuals. The objective of this study was to examine emotional as well as physiological responses of tinnitus sufferers to visual, auditory and nociceptive stimuli (hand immersion in hot water), in comparison with matched controls without tinnitus. Sounds and images were selected from the International Affective Digitized Sounds and Pictures and included stimuli of positive, neutral, and negative valence. Subjective judgments and physiological responses including electro-myographic zygomatic muscle activity, cardiac rhythm, and skin conductance were measured and comparisons were made between groups. Twenty-four elderly tinnitus sufferers (x🛛=66 ±6 years old) and nineteen matched controls (x🔅=63 ±6 years old) were tested. Appreciation of positive valence stimuli was blunted in all stimulus modalities and zygomatic muscle responses to stimuli of negative valence were diminished among tinnitus sufferers when compared to controls. The tinnitus group also displayed significantly less cardiac rhythm deceleration in response to auditory and nociceptive stimuli, whereas deceleration of similar magnitudes occurred in both groups in response to visual stimuli. The data are consistent with the proposition that emotional reactivity may be altered among tinnitus sufferers.

8. Sustainable hearing healthcare: iPad point of care diagnostic audiometry in Uganda

Katie de Champlain, R.Aud^a, Jennifer Bornstein^b, Dr. Andrew Thamboo^c, Dr. Ryan Rourke^d, Dr. Brian Westerberg^e, Dr. JP Vaccani^f, Dr. Doreen Nakku^g, Dr. Victoria Nyaiteera^g, Dr. Matthew Bromwich^f

- ^a Alberta Health Services, Calgary AB
- ^b Alberta Health Services, Edmonton AB

^c Faculty of Medicine, University of British Columbia BC

^d Faculty of Medicine, University of Ottawa ON

^e Otology and Neurotology, St. Paul's Rotary Hearing Clinic, Vancouver BC

^fOtolaryngology, Children's Hospital of Eastern Ontario, Ottawa ON

^g Mbarara University of Science and Technology, Mbarara, Uganda

Objectives: To perform hearing screening in children using an iPad application, "Shoebox Audiometer" in order to estimate the prevalence of hearing loss and demonstrate the need for such equipment in Mbarara, Uganda, a setting with inadequate audiological resources.

Background: Audiological resources and trained personnel are limited in developing countries, including Africa. In Canada, audiometry testing typically takes over 10 minutes to complete and costs approximately CAD 300, which is unaffordable in developing countries. This application presents a portable and low-cost medium to perform audiometry in low resource settings. It provides information on the degree of hearing and can be administered by any personnel trained to use it.

Methods: Different classrooms were randomly selected from six schools. In total, 639 pupils (4-18 years) were screened within a two-week time period. Screenings were completed using supra-aural headphones at 500, 1000, 2000 and 4000 Hz bilaterally, as well as otoscopy. The procedure entails moving a visual image to one side of the screen if a tone is heard. Potential hearing losses were identified and referred for medical follow-up.

Results: The average test took 303.68 seconds (SD = 113.26). The mean pure tone average (PTA) was 20.49 dB HL (SD = 8.63) and 20.98 dB HL (SD = 7.78) on the left and right side, respectively. There were 40 children with a PTA of 30 dB HL or greater for the left and 63 for the right side. Of those, abnormal otoscopy was found in 18 for the left ear and 13 for the right ear.

Conclusions: The application is easy to learn and enables many patients to be screened in a short time, creating a more efficient healthcare system. By introducing these alternatives to testing we hope to see an increase in identified hearing losses in low resource settings. Future studies may include the use of tele-audiometry.

9. Uganda hearing healthcare program: A humanitarian effort to improve hearing healthcare in a low resource setting

Katie de Champlain, R.Aud (Team Audiologist)^a

^a Alberta Health Services, Calgary AB

Objectives: The Uganda Hearing Healthcare Program is not-for-profit and focuses on establishing collaborative relationships with stakeholders to generate sustainable solutions for improving hearing healthcare in a low-resource setting. Our program is driven by the needs identified by our Ugandan stakeholders and a common goal of improving healthcare, advocacy and research is shared.

Background: Communities in Uganda are under resourced in the field of hearing healthcare, with no audiology training available. A high prevalence of preventable hearing loss and otologic diseases, with many left untreated, signifies the need for better hearing healthcare. The program has been led by Vancouver based otolaryngologist, Dr. Brian Westerberg since 2001. **Methods:** A team of otolaryngologists, audiologists, nurses and other health professionals voluntarily visit Uganda annually for a two week mission to provide education and resources to healthcare workers. Educational and clinical training are provided and include, but are not limited to, hearing assessments, hearing aid fitting and ear surgery.

Results: Our team has visited multiple health care facilities throughout the country, including those in Kampala, Mbarara, Mbale and Jinja. Many individuals received audiological training and all centres are now equipped to conduct hearing testing. Ugandan otolaryngologists have increased their confidence and improved surgical skills through the education they have received. A strong partnership has been formed, with all members learning from one another.

Conclusions: There is an art to doing humanitarian work in developing countries, and one should never push their own country's way on another. The success of any humanitarian program begins with creating collaborative partnerships with stakeholders, creating goals that fit the needs of the community and identifying sustainable solutions that all members will be motivated to work towards. Our hope is to continue to enhance skills in audiology and otolaryngology in Uganda so that patients have better access to healthcare.

Retracted Posters:

10. The effects of musical training on cortical auditory evoked responses in children with and without hearing loss* (retracted)

Koravand, A.¹, Martel-Lamothe, P.¹, Avoli, E.¹ & Comeau, G.²

¹ Audiology and Speech-Language Pathology Program, University of Ottawa, Ontario, Canada

² School of Music, University of Ottawa, Ontario, Canada

Background & Objectives: The aim of the study was to investigate the neurophysiological responses in children with and without hearing loss after a special auditory training program. Several studies have shown learning enhancement after intensive musical training. We investigated how the brain develops differently in children with different hearing conditions undergoing musical training. More specifically, the purpose of this study was to explore the changes caused by piano lessons on types of brainwave called the Auditory Evoked Potentials in children with and without hearing loss. These brainwaves can be measured noninvasively in reaction to simple or more complex sounds.

Method: Twenty 4 to 9 year-old children with normal hearing and with hearing loss participated in the study. Auditory event–related potentials were recorded with standard and deviant verbal and nonverbal stimuli presented in a passive oddball paradigm. Cortical auditory evoked responses, P1, N1, P2, N2, and mismatch negativity (MMN) were measured. Cortical data have been analyzed with the Brain-Vision Analyzer software.

Results: Different pattern of results have been found; N1 and P2 deflection were absent in more children with Cochlear Implant (CI) compared to children with normal hearing. Moreover, the N2 and MMN latency and/or amplitude values were significantly different between the two groups of participants for the verbal and nonverbal stimuli.

Conclusion: Findings indicated different patterns of cortical responses in children with CI and or with Hearing Aid. Results suggest maturational delays and/or slower auditory processing mechanism in these children, as shown by the neurophysiological markers N1, P2, N2 and MMN.

11. Smoking as a risk factor for the development of noise-induced hearing loss: A literature review* (Retracted)

Khalil A. Surahyo

School of Communication Sciences and Disorders, Western University

Objective: To systematically search the literature to determine whether noise-exposed smokers have a greater likelihood of developing a noise-induced hearing loss than noise-exposed non-smokers.

Background: Noise-induced hearing loss is one of the most common occupational disease. Smoking has been associated with noise-induced hearing loss but there are no systematic reviews which have examined smoking and the risk of noise-induced hearing loss in adult workers.

Methods: I searched Pubmed, EMBASE and Medline to identify pertinent studies.

Results: A total of twenty-two cross-sectional studies were identified that examined the effects of smoking on the development of noise-induced hearing loss. Eighteen studies found that current smokers exposed to noise were significantly more likely to develop a noise-induced hearing loss than non-smokers exposed to noise whereas four studies did not find a significant association. Five studies studied the association between noise-induced hearing loss and cumulative tobacco use. In all five studies, the risk of hearing loss increased with increased pack-years of smoking. Four out of the five studies that looked at the interactive effect of smoking and noise exposure on hearing loss found that the combined effect of noise and smoking on hearing loss was greater than the sum of the effects of noise and smoking.

Conclusions: The evidence suggests that smoking combined with noise exposure increases the risk for developing noise-induced hearing loss. The effect is dose-dependent and the combined effect of smoking and noise exposure on hearing loss is greater than the sum of the individual effects of smoking and noise exposure.

Speakers



Carol Bauer

Dr. Carol A. Bauer is an Otologist at Southern Illinois University in Springfield, Illinois. She completed her residency at the University of Iowa in 1994 and a Neurotology fellowship at Baylor College of Medicine in 1995. She has directed the Tinnitus Clinic, Cochlear Implant Center, and the Hearing and Balance Center at SIU since 1995. Dr. Bauer has received funding from the National Institutes of Health, the Tinnitus Research Consortium and the American Tinnitus Association to investigate the physiologic and neurologic bases of tinnitus. Her basic science research has led to clinical trials of pharmacologic and acoustic therapies for chronic tinnitus.



Arlene Carson

Arlene Carson held a variety of clinical and rehabilitative audiology positions over more than two decades before completing her PhD in 2000. Arlene's interest in interdisciplinary approaches to researching help-seeking for hearing loss dovetails with her research in health promotion and the social determinants of health as research affiliate with the Centre on Aging at the University of Victoria. Arlene has taught courses at UBC, MacEwan University, and Western China University of Medical Sciences. To balance her work in academia and as an independent researcher, consultant, and program evaluator Arlene plays jazz piano and accordion with several groups on Vancouver Island.



Theresa Chisolm

Dr. Theresa (Terry) Hnath Chisolm completed her undergraduate degree at Lehman College, her master's degree in Audiology at Montclair State College and her PhD in Speech & Hearing Sciences at the Graduate School of the City University of New York. She joined the faculty in the Department of Communication Sciences & Disorders at the University of South Florida as an Assistant Professor in 1988. She is currently Full Professor and Department Chair, having served as chair since 2004. Her area of research and clinical expertise is rehabilitative audiology in children and adults. She has received funding for her research from NIH-NIDCD, VA Merit Reviews, and contracts with the hearing aid industry. Dr. Chisolm currently is Co-PI on a USDOE OSEP grant for training masters' degree students in Speech-Language Pathology to work with children with hearing loss who come from culturally-diverse backgrounds from a listening and spoken language perspective. She will be starting an NIA R34 Clinical Trials Planning grant in collaboration with Frank Lin, M.D., Johns' Hopkins University "Planning a trial of Hearing Rehabilitative Treatment to Reduce Cognitive Decline" In 2011, Dr. Chisolm received the Distinguished Achievement Award from the American Academy of Audiology.



Sumitrajit Dhar

Sumit trained in Audiology and Hearing Science at the University of Mumbai, Utah State University, and Purdue University. His laboratory works on the basic science and applications of otoacoustic emissions. The Dhar lab has made contributions to the understanding of the generation mechanisms of otoacoustic emissions, especially distortion product otoacoustic emissions. Current research in the laboratory continues in this area with additional efforts to apply any understanding to the development of clinical tools. These tools are developed with a particular interest in early and accurate detection of cochlear pathologies. Work in the Dhar laboratory is supported by the National Institutes of Health of the United States of America, The Knowles Hearing Center at Northwestern University, and various private foundations.



Dave Fabry

Dave Fabry received three degrees below zero from the University of Minnesota (BA, MA, Ph.D) and subsequently moved East. Where he served as Research Audiologist at Walter Reed Army Medical Center in 1988. In 1990, he returned to Minnesota, working in the sunny Southeastern tropical portion of the state at Mayo Clinic until 2002, serving as Chief of Audiology from 1994-2002. He then worked for Phonak from 2002-2007, then served as Chief of Audiology at The University of Miami Medical Center from 2007-2009, when he returned once again to Minnesota, where he serves as Vice President of Audiology and Professional Relations for Starkey Hearing Technologies. He is married to Liz and has a daughter, Loren, who recently graduated from – you guessed it – the University of Minnesota.



Frederick (Erick) Gallun, PhD

Frederick J. Gallun, Ph.D. is a researcher at the National Center for Rehabilitative Auditory Research, and Associate Professor in Otolaryngology and the Neuroscience Graduate Program at Oregon Health and Science University. He received his degree in Cognitive Psychology from UC Berkeley and completed an NIH-funded postdoctoral fellowship at Boston University. His laboratory and research collaborations are funded by three NIH grants and three VA Merit Awards. The work focuses on the impacts of aging, hearing loss, and brain injury on the ability to parse the auditory scene, with an emphasis on spatial hearing and the processing of temporal information.



Mead C. Killion, Ph.D., Sc.D. (hon)

Mead Killion is the founder and Chief Technology Officer of Etymotic Research, an R&D organization whose mission includes:

- Helping people hear,
- Helping people preserve their hearing,
- Helping people enjoy hearing, and
- Improving hearing tests.

Killion is an Adjunct Professor of Audiology at Northwestern University. He holds two degrees in mathematics and a third degree in audiology plus an honorary doctor of science from Wabash College. He has published 80 papers and 20 book chapters in the fields of acoustics, psychoacoustics, transducers, and hearing aids, and has lectured in 19 foreign countries. Killion helped design several generations of hearing aid microphones, earphones and integrated circuit amplifiers. His research has resulted in dramatic increases in the sound quality of hearing aids, earplugs, and earphones. As a consultant to the Chicago Symphony Orchestra, he has been active in introducing high fidelity hearing protection for musicians. He is a member of the Board of Trustees of VanderCook College of Music. He has 77 U.S. patents issued, with 17 patents pending.

In addition, Killion is a dedicated choir director, a violinist, an amateur jazz pianist, has run 32 marathons, and enjoys sailing.



Ariane Laplante-Lévesque

Ariane Laplante-Lévesque is a research project manager at the Eriksholm Research Centre in Denmark where she leads research investigating hearing aid dispensing processes. She is also a part-time assistant professor at Linköping University in Sweden where she studies information technology applications in audiology. Ariane completed her PhD at the University of Queensland in Australia 2010. She has trained and worked as a clinical audiologist in her native Canada as well as in Australia. Her professional interests include the rehabilitation of adults and older adults with an acquired hearing impairment, the client-audiologist relationship, and tele-audiology.



Jane Lea

Dr. Jane Lea is an Otolaryngologist specializing in Otology and Neurotology and Paediatric Otolaryngology. She completed her undergraduate BSc degree at George Washington University, Washington DC in 1999, followed by her MD in 2005 from the Faculty of Medicine at The University of Toronto. Dr. Lea then completed a 5-year residency in Otolaryngology-Head & Neck Surgery at the University of Toronto in 2010. This was followed by subspecialty fellowship training in Otology and Neurotology at The University of British Columbia (2010-2011). Training abroad at Johns Hopkins University (Baltimore, USA) and Royal Prince Alfred Hospital (Sydney, Australia) was undertaken in 2011 with a focus on vestibular disorders. In 2012, a second subspecialty fellowship was completed in Paediatric Otolaryngology at the University of British Columbia. Her current clinical practice is based in Vancouver at St. Paul's Hospital, Vancouver General Hospital, and BC Children's Hospital. She is currently a Clinical Assistant Professor within the Department of Surgery at the University of British Columbia.



Kathy McGilton

Katherine S. McGilton (RN, PhD) is a Senior Scientist at the Toronto Rehabilitation Institute-University Health Network and Associate Professor at the Lawrence S. Bloomberg Faculty of Nursing, University of Toronto. She has research funding as the principal investigator from the Canadian Institutes of Health Research (CIHR), Alzheimer Society of Canada, Nursing Research Fund, and the MOH<C. The focus of her work is on enhancing the care of the older adult, especially those with dementia, through the development and application of interventions, outcome measures and models of care in practice. Her work has examined the nature of relationships between nursing staff and older adults and between staff and their supervisors and the effect on staff outcomes such as retention, burnout and stress.



Catherine McMahon

Professor Catherine McMahon is the Head of Audiology at Macquarie University. She was part of the team which successfully bid for \$40 million from the Australian Education Investment Fund to establish the Australian Hearing Hub, and is a chief investigator of the HEARing CRC. A/Prof McMahon is a member and project leader of the Macquarie University Centre for Language Sciences, a senior scientist and project leader of the HEARing CRC, and an associate investigator with the ARC Centre of Excellence the Centre for Cognition and its Disorders (CCD). Between 2006-2012, Catherine was the Vice President of Audiology Australia, the peak professional body for audiologists, and was awarded Young Professional of the Year (2008) by Professions Australia.



Paul Mick

I finished my Otolaryngology-Head and Neck Surgery residency at the University of British Columbia in 2010. Afterwards, I completed a fellowship in Neurotology and Skull Base Surgery ata Sunnybrook Health Sciences Centre in Toronto under the tutelage of Drs. Nedzelski, Chen and Lin. An interest in public health research led to a Masters degree in public health with a concentration in epidemiology from Harvard. My practicum focused on the association between age-related hearing loss and social isolation and was supervised by Dr. Frank Lin from Johns Hopkins University. I am a researcher with the Canadian Consortium on Neurodegeneration in Aging and practice in Kelowna.



David Moore

Dave Moore is Director of the Communication Sciences Research Center at Cincinnati Children's Hospital, and a Professor of Otolaryngology (University of Cincinnati) and Psychology (University of Manchester). Educated in Australia (Monash University), he spent 22 years at Oxford University on projects including auditory spatial hearing, neurobiology of deafness, and otitis media. As Director of the Medical Research Council Institute of Hearing Research, Nottingham (2002-12), he focussed on auditory development and learning in humans. In 2010 he was awarded the George Davey Howells prize (Royal Society of Medicine) for editing the three volume "Oxford Handbook of Auditory Science".



Kathy Pichora-Fuller

Kathy Pichora-Fuller is a Full Professor of Psychology at the University of Toronto, a Guest Professor at Linköping University in Sweden, and an Adjunct Scientist at the Toronto Rehabilitation Institute and at the Rotman Research Institute at Baycrest in Toronto. She practiced audiology at Mount Sinai Hospital in Toronto before completing her PhD in Psychology in 1991. Until 2002, she was on faculty in the School of Audiology and Speech Sciences and Director of the Institute for Hearing Accessibility Research at UBC. She combines experience in rehabilitative audiology with experimental research on auditory and cognitive aging.



Virginia Ramachandran

Virginia Ramachandran, Au.D., Ph.D. is a Senior Staff Audiologist and Audiology Research Coordinator at Henry Ford Hospital and an Adjunct Assistant Professor and the Audiology Clinical Education Coordinator at Wayne State University in Detroit, Michigan. She has published and presented nationally on the topics of credentialing, clinical education, and reporting and documentation for audiology. She is the co-author of the "Basic Audiometry Learning Manual" and "Professional Communication in Audiology" and serves as an Associate Consulting Editor for Plural Publishing, Inc. She is a co-creator of the eAudio tablet solution for audiologic reporting, but has no current financial interests in the product.



Gabrielle Saunders

Gabrielle Saunders is 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, OR. Her primary research interests focus on approaches to audiologic rehabilitation for older individuals, and application of health behavior theory to the understanding of hearing health behaviors. She has ongoing funded research studies examining improved approaches to hearing aid orientation, attitudes and beliefs underlying hearing aid acquisition, auditory complaints among blast-exposed Veterans, and innovative approaches to automated hearing screening.



Gurjit Singh

Gurjit Singh is a Senior Research Audiologist at Phonak AG, an Adjunct Lecturer in the Department of Speech Language Pathology at the University of Toronto, and an Adjunct Scientist at the Toronto Rehabilitation Institute and the University of Toronto. Gurjit completed a postdoctoral fellowship at the Toronto Rehabilitation Institute, obtained his Ph.D. (Cognitive psychology) from the University of Toronto, his M.Sc. (Audiology) from the University of Western Ontario, and his M.A. (Social psychology) from the University of Waterloo. Gurjit is also a clinical audiologist registered with the College of Audiologists and Speech-Language Pathologists of Ontario and certified with the Canadian Association of Speech-Language Pathologists and Audiologists. His research interests include teleaudiology, the role of cognition in audiology, and factors that lead to success with hearing aids.



Sigfrid D. Soli, Ph.D.

Dr. Soli is a Senior Clinical Research Scientist at the House Clinic and an Adjunct Clinical Professor of Otolaryngology at the University of Southern California Keck School of Medicine. He develops and evaluates hearing diagnostics, assessment procedures, and devices for individuals for hearing impairment. Dr. Soli is a Fellow of the Acoustical Society of America. He has been an advisor to the US National Research Council. He has also served as a member of the US FDA's Ear, Nose, and Throat Device Panel. He is a Senior International Advisor to the Chinese Academy of Audiological Rehabilitation.



Brian Taylor

Brian Taylor is currently the Director of Practice Development & Clinical Affairs for Unitron and the Editor of Audiology Practices, the quarterly publication of the Academy of Doctor's of Audiology. Brian also serves on the advisory board for the Better Hearing Institute and is a frequent contributor to Audiology Online. During the first decade of his career, he practiced clinical audiology in both medical and retail settings. Since 2005, Dr. Taylor has held a variety of management positions within the industry in both the United States and Europe. He has published over 50 articles and book chapters on topics related to hearing aids, diagnostic audiology and business management. Brian has authored three text books Fitting and Dispensing Hearing Aids (co-authored with Gus Mueller), Consultative Selling Skills for Audiologists, Quality in an Audiology: Design & Implementation of the Patient Experience.



Glynnis Tidball

Glynnis Tidball, M.Sc. (SLP, Aud) is a registered clinical audiologist at St. Paul's Hospital in Vancouver and clinical instructor at the School of Audiology and Speech Sciences in the UBC Faculty of Medicine. Her primary professional focus for the last 16 years has been management of tinnitus and hyperacusis. She runs regular group and individual tinnitus sessions at the St. Paul's Hospital Tinnitus Clinic and participates in related clinical research through the hospital. She has been a sponsored speaker on tinnitus and hyperacusis to audiology and otolaryngology groups across Canada.



Kelly Tremblay

Kelly Tremblay is a Professor at the University of Washington in Seattle, WA. She began her career in Canada as an audiologist and then completed a PhD at Northwestern University in Chicago. She also trained at the House Ear Institute as a post-doc. With this background she is keenly aware of the communication difficulties described by adults with and without hearing loss and have developed a program of research aimed at improving auditory rehabilitation. Her research focuses on identifying physiological and perceptual processes associated with age-related perceptual problems in a way that is relevant to clinicians and their patients. Her commitment to advancing "translational research" is evident through her service and her science: she has over 80 publications and recently edited a book series titled "Translational Perspectives in Auditory Neuroscience."

Richard Tyler

NO PHOTO

Rich was trained as a clinical audiologist at The University of Western Ontario and then completed a Ph.D. in Psychoacoustics and The University of Iowa. He worked initially at the Institute of Hearing Research in the United Kingdom and is currently a Professor in both the Department of Otolaryngology - Head & Neck Surgery and in the Department of Communication Sciences and Disorders at the University of Iowa. His scientific work includes the quantification of tinnitus,

Surgery and in the Department of Communication Sciences and Disorders at the University of Iowa. His scientific work includes the quantification of tinnitus, necessary for its investigation, as well as the investigation of different treatments. Dr. Tyler sees tinnitus patients weekly, and hosts an annual Tinnitus Treatment Workshop. He has edited The Tinnitus Handbook (2000), Tinnitus Treatments: Clinical Protocols Tyler, R.S. (Ed.). (2006), and The Consumer Handbook on Tinnitus (2008).



Gail Whitelaw

Gail M. Whitelaw, Ph.D. is the Director of the Speech-Language-Hearing Clinic at The Ohio State University and is the audiology faculty member on the Leadership Education in Neurodeveopmental and Developmental Disorders (LEND) grant at the Nisonger Center in Columbus, OH. Dr. Whitelaw teaches courses related to pediatric audiology, educational audiology, tinnitus, and professional issues in the AuD program at Ohio State. She supervises clinical practicum and provides clinical services to children with developmental disorders and their families. Dr. Whitelaw also provides educational audiology services to schools in Central Ohio. She has worked with children on the autism spectrum for more than 30 years.



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1:25-1	:45	-	Phonak
1:55-2	:15	-	Starkey



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