Audiology Update

May 2022

Welcome to the latest copy of the Audiology Update. The aim of this publication is to bring together a range of recently published research and guidance that will help you make evidence-based decisions.

Accessing Articles

The following abstracts are taken from a selection of recently published articles.
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Please contact Holly if you would like more information, or further evidence searches: holly.cook3@nhs.net.

New NICE Guidance

Endoscopic balloon dilation for subglottic or tracheal stenosis
Interventional procedures guidance [IPG719]
Published: 02 March 2022
https://www.nice.org.uk/guidance/ipg719

Updated NICE Guidance

Otitis media (acute): antimicrobial prescribing
NICE guideline [NG91]
Published: 28 March 2018 Last updated: 11 March 2022
https://www.nice.org.uk/guidance/ng91

A selection of papers from Medline and CINHAL (Dec 2021 – May 2022)

1. **Comparing the diagnostic accuracy of audiometric Weber test and tuning fork Weber test in patients with conductive hearing loss.**

Item Type: Journal Article

Authors: Abdullah, Siti Nazira;Zakaria, Mohd Normani;Salim, Rosdan;Md Daud, Mohd Khairi and Nik Othman, Nik Adilah

Publication Date: Apr ,2022

Journal: Laryngoscope Investigative Otolaryngology 7(2), pp. 523-529

Abstract: Objectives: Weber test is typically conducted using tuning forks, but an audiometer can also be used for a similar purpose. Compared to the tuning fork Weber (TFW) test, performing the audiometric Weber (AW) test offers many advantages. Nevertheless, AW and TFW tests' performance compared to pure-tone audiometry (PTA) has yet to be studied. The present study aimed to determine the accuracy and agreement between the AW and TFW tests compared to PTA. Methods: In this observational cross-sectional study, 74 participants (aged 12-67 years) with unilateral conductive hearing loss (CHL) or bilateral asymmetrical CHL were enrolled. The TFW test was performed according to the established protocol at 256 and 512 Hz. For the AW test, the bone vibrator was placed in the middle of the forehead, where 250 and 500 Hz frequencies were tested. TF and AW test results were then compared with the expected lateralization from the respective PTA results. Results: At 256 Hz (or 250 Hz), the overall accuracy values of TFW and AW tests were 81.1% and 86.5%, respectively. At 512 Hz (or 500 Hz), the overall accuracy results of TFW and AW tests were 85.1% and 82.4%, respectively. In addition, the kappa statistics revealed substantial agreements between the two tests and PTA (k = .63-.72). Conclusion: Both AW and TFW tests are reasonably accurate in assessing patients with CHL. It is recommended for audiologists to perform the simple AW test to verify incomplete or questionable audiograms that are commonly encountered in clinical practice. Level of evidence: Level 3b. Copyright © 2022 The Authors. Laryngoscope Investigative Otolaryngology published by Wiley Periodicals LLC on behalf of The Triological Society.

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y+of+audiometric+Weber+test+and+tuning+fork+Weber+test+in+patients+with+conductive+hearing+loss.&aulast=Abdullah&pid=%3Cauthor%3EAbdullah+SN%3BZakaria+MN%3BSalim+R%3BMd+Daud+MK%3BNik+Othman+NA%3C%2Fauthor%3E%3CAN%3E35434338%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

2. **Cochlear implantation in common cavity deformity: a systematic review**

Item Type: Journal Article

Authors: Al-Mahboob, Ayshah;Alhabib, Salman F.;Abdelsamad, Yassin and Alzhrani, Farid

Publication Date: Jan ,2022

Journal: European Archives of Oto-Rhino-Laryngology 279(1), pp. 37-48

Abstract: PURPOSE: Cochlear implantation became a valid hearing rehabilitation option in common cavity deformity. This study aimed to assess the audiological and speech outcomes of cochlear implantation in common cavity deformity patients and to address the surgical aspect used in this population. METHODS: A comprehensive systematic literature review based on preferred reporting items for systematic reviews and meta-analyses (PRISMA) guideline from database inception through April 2020. Eighteen published articles including 138 patients with common cavity deformity met the inclusion criteria. These articles studied the surgical techniques and the audiological outcomes of cochlear implantation in patients with common cavity deformity in English language. RESULTS: Trans-mastoid labyrinthotomy was the common surgical approach in these patients. The average speech intelligibility rating and categories of auditory performance scores in common cavity deformity were lower than in normal cochlea subjects (p 0.05) compared with other types of inner ear malformations. CONCLUSION: Patients with common cavity deformity who underwent cochlear implantation showed a beneficial audiological and speech outcome. However, their performance is highly variable. Therefore, pre-operative counseling of the parents is necessary. The surgical approaches should be individualized according to clinical, radiological, and surgical findings. Copyright © 2021. The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

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3. **Cochlear implant in immune mediated inner ear diseases: Impedance variations and clinical outcomes.**

Item Type: Journal Article

Authors: Atturo, Francesca;Portanova, Ginevra;Russo, Francesca Yoshie;Seta, Daniele De;Mariani, Laura;Borel, Stephanie;Greco, Antonio;Mosnier, Isabelle and Mancini, Patrizia

Publication Date: Mar ,2022

Journal: Cochlear Implants International 23(2), pp. 70-79

Abstract: OBJECTIVE: Immune-mediated inner ear disease (IMIED) might cause severe/profound hearing loss and these patients are considered ideal candidates to cochlear implant (CI) surgery. The aim of the study was to

evaluate impedance changes over time. METHOD: The Study Group (SG) was composed of CI IMIED patients (31 ears) and a Control Group (CG) of CI patients with hearing loss not related to their immune system (31 ears). Audiological performance and impedance values were measured and compared amongst groups at 3, 6, 12 and 18 months following the fitting sessions. RESULTS: Speech perception was significantly better for SG in word and sentence recognition in quiet. Impedance values were, on average, significantly higher for apical and middle electrode segments in SG compared to CG at the 3- month follow-up and were maintained over time. Additionally, a subset of SG patients (active patients) experienced significantly greater impedance fluctuation corresponding to clinical symptom reactivation. CONCLUSION: IMIED patients achieve good audiological performance. However, the relapsing inflammation could change the inner ear environment, causing impedance fluctuations and, consequently, more frequent CI fittings. Additionally, impedance evaluation could be utilized as an early warning sign of IMIED recurrence and as an aid to therapeutic decision-making.

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4. **Frailty and Quality of Life After Cochlear Implantation in Older Adults.**

Item Type: Journal Article

Authors: Aylward, Alana;Murphy-Meyers, Morganne;Allen, Chelsea McCarty;Patel, Neil S. and Gurgel, Richard K.

Publication Date: 2022

Journal: Otolaryngology - Head & Neck Surgery 166(2), pp. 350-356

Abstract: OBJECTIVE: To examine the relationship among frailty index, hearing measures, and hearing-related quality of life (QOL) in older recipients of cochlear implants. STUDY DESIGN: Cross-sectional survey. SETTING: Academic medical center. METHODS: Adults aged >=65 years at the time of receiving cochlear implants between July 13, 2000, and April 3, 2019, were asked to complete a questionnaire on hearing-related QOL. Chart review was performed to identify patients' characteristics. Correlations were calculated between frailty index and audiologic outcome measures as well as between speech recognition scores and QOL scores. Linear regression models were developed to examine the impact of clinical characteristics, frailty index, and hearing measures on hearing-related QOL. RESULTS: Data for 143 respondents were included. The mean age was 80.7 years (SD, 7.1), with a mean 27.8 years of hearing loss (SD, 17.4) before implantation. The mean frailty index was 11.1 (SD, 10.6), indicating that patients had 1 or 2 of the measured comorbidities on average. No correlation was found between lower frailty index (better health) and hearing scores, including pure tone averages (PTAs) and speech recognition scores. Lower frailty index and larger improvement in PTA after cochlear implantation predicted better QOL scores on univariate analysis (respectively, P = .002, beta = -0.42 [95% CI, -0.68 to -0.16]; P = .008, beta = -0.15 [95% CI, -0.26 to -0.04]) and multivariate analysis (P = .047, beta = -0.28 [95% CI, -0.55 to -0.01]; P = .006, beta = -0.16 [95% CI, -0.28 to -0.05]). No speech recognition scores correlated with QOL after cochlear implantation. CONCLUSIONS: Frailty index does not correlate with hearing scores after cochlear implantation in older adults. Lower frailty index and more improvement in PTA predict better QOL scores after cochlear implantation in older adults.

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356&date=2022&title=Otolaryngology+-+Head+%26+Neck+Surgery&atitle=Frailty+and+Quality+of+Life+After+Cochlear+Implantation+in+Older+Adults.&aulast=Aylward&pid=%3Cauthor%3EAylward+A%3BMurphy-Meyers+M%3BAllen+CM%3BPatel+NS%3BGurgel+RK%3C%2Fauthor%3E%3CAN%3E33874790%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

5. **Anatomical and audiological considerations in branchiootorenal syndrome: A systematic review**

Item Type: Journal Article

Authors: Biggs, Kirsty;Crundwell, Gemma;Metcalfe, Christopher;Muzaffar, Jameel;Monksfield, Peter and Bance, Manohar

Publication Date: Apr ,2022

Journal: Laryngoscope Investigative Otolaryngology 7(2), pp. 540-563

Abstract: Objective: Establish anatomical considerations, audiological outcomes, and optimal management in patients with branchiootic/branchiootorenal syndrome (BO/BOR). Methods: Databases reviewed: Medline, Pubmed, Embase, Web of Science, Cochrane Collection, and ClinicalTrials.gov. Clinical or radiological studies of patients with BOR syndrome describing either the audiological profile or anatomical changes were included. Articles in which BOR syndrome was associated with other syndromes, and those that were focused only on general and genetic aspects of BOR syndrome were excluded. Articles were assessed using Oxford Centre for Evidence-Based Medicine (OCEBM) grading system and the Brazzelli risk of bias tool for nonrandomized studies. Results: Searches identified 379 articles. Of these, 64 studies met the inclusion criteria, reporting outcomes in 482 patients from at least 95 families. In 308 patients, hearing loss was categorized as sensorineural (29%), conductive (20%), and mixed (51%). Hearing outcomes were variable in terms of onset, pattern, and severity; ranging from mild to profound deafness. One hundred sixty-nine patients presented with inner ear anomalies, 145 had middle, and 151 had external ear abnormalities. In 44 studies, 58 ear operations were described. Mixed outcomes were reported in patients managed with hearing aids or middle ear surgery; however, successful cochlear implantation was described in all five cases. Conclusion: The anatomical and audiological profiles of patients with BO/BOR are variable. A range of surgical procedures were described, however lacked objective outcome measures. Given the range of anatomical variants, management decisions should be made on an individual basis including full audiological and radiological assessment. Level of evidence: NA. Copyright © 2022 The Authors. Laryngoscope Investigative Otolaryngology published by Wiley Periodicals LLC on behalf of The Triological Society.

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6. **Chronic Otitis Externa Secondary to Tympanic Membrane Electrode Placement in Rhesus Macaques (Macaca mulatta).**

Item Type: Journal Article

Authors: Burton, Jane A.;Tarabillo, Alejandro L.;Finnie, Kelsey R.;Shuster, Katherine A.;Mackey, Chase A.;Hackett, Troy A. and Ramachandran, Ramnarayan

Publication Date: Apr 01 ,2022

Journal: Comparative Medicine 72(2), pp. 104-112

Abstract: Otitis externa (OE) is a condition that involves inflammation of the external ear canal. OE is a commonly reported condition in humans and some veterinary species (for example, dogs, cats), but has not been reported in the literature in macaques. Here, we present a case series of acute and chronic OE likely precipitated by abrasion of the ear canal with a tympanic membrane electrode in 7 adult male rhesus macaques (Macaca mulatta). All animals displayed purulent, mucinous discharge from 1 or both ears with 3 macaques also displaying signs of an upper respiratory tract (URT) infection during the same period. A variety of diagnostic and treatment options were pursued including consultation with an otolaryngologist necessitated by the differences in response to treatment in macaques as compared with other common veterinary species. Due to the nature of the studies in which these macaques were enrolled, standard audiological testing was performed before and after OE, including tympanometry, auditory brainstem responses (ABRs), and distortion product otoacoustic emissions (DPOAEs). After completion of study procedures, relevant tissues were collected for necropsy and histopathology. Impaired hearing was found in all macaques even after apparent resolution of OE signs. Necropsy findings included abnormalities in the tympanic membrane, ossicular chain, and middle ear cavity, suggesting that the hearing impairment was at least partly conductive in nature. We concluded that OE likely resulted from mechanical disruption of the epithelial lining of the ear canal by the ABR electrode, thereby allowing the development of opportunistic infections. OE, while uncommon in macaques, can affect them and should be included as a differential diagnosis of any macaque presenting with otic discharge and/or auricular discomfort.

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7. **Tympanic membrane perforations: the importance of etiology, size and location.**

Item Type: Journal Article

Authors: Castelhano, L.;Correia, F.;Colaco, T.;Reis, L. and Escada, P.

Publication Date: 2022

Journal: European Archives of Oto-Rhino-Laryngology

Abstract: PURPOSE: The ability to predict the degree of a conductive hearing loss caused by a tympanic membrane perforation is important for every otologist, as it may require additional diagnostic tests and prevent unexpected intraoperative findings. The aim of this study was to correlate the various characteristics of a perforation (etiology, size, location, involvement of the manubrium or umbo) with the degree and frequency predominance of the consequent hearing loss. METHODS: A transversal study in a tertiary hospital center was conducted between July 2019 and December 2020. Fifty-eight patients with 65 tympanic perforations underwent a comprehensive medical and audiological evaluation, which included an otoendoscopy. An image processing software (ImageJ R) was used to measure the perforated area. The qualitative variables were etiology, affected quadrants, presence of myringosclerosis and involvement of umbo or manubrium of the malleus. The air-bone gap was measured at 250, 500, 1000, 2000 and 4000 Hz. Primary outcomes (mean air-bone gap and pure-tone average) were evaluated to find clinical factors associated with worse hearing.

RESULTS: Data collected from 50 ears was included. Perforation size showed a positive statistically significant correlation with the air-bone gap (r = .508; p) was used to measure the perforated area. The qualitative variables were etiology, affected quadrants, presence of myringosclerosis and involvement of umbo or manubrium of the malleus. The air-bone gap was measured at 250, 500, 1000, 2000 and 4000 Hz. Primary outcomes (mean air-bone gap and pure-tone average) were evaluated to find clinical factors associated with worse hearing. RESULTS: Data collected from 50 ears was included. Perforation size showed a positive statistically significant correlation with the air-bone gap (r = .508; p) was used to measure the perforated area. The qualitative variables were etiology, affected quadrants, presence of myringosclerosis and involvement of umbo or manubrium of the malleus. The air-bone gap was measured at 250, 500, 1000, 2000 and 4000 Hz. Primary outcomes (mean air-bone gap and pure-tone average) were evaluated to find clinical factors associated with worse hearing. RESULTS: Data collected from 50 ears was included. Perforation size showed a positive statistically significant correlation with the air-bone gap (r = .508; p) was used to measure the perforated area. The qualitative variables were etiology, affected quadrants, presence of myringosclerosis and involvement of umbo or manubrium of the malleus. The air-bone gap was measured at 250, 500, 1000, 2000 and 4000 Hz. Primary outcomes (mean air-bone gap and pure-tone average) were evaluated to find clinical factors associated with worse hearing. RESULTS: Data collected from 50 ears was included. Perforation size showed a positive statistically significant correlation with the air-bone gap (r = .508; p

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8. **Assessing Loss to Follow-up After Newborn Hearing Screening in the Neonatal Intensive Care Unit: Sociodemographic Factors That Affect Completion of Initial Audiological Evaluation.**

Item Type: Journal Article

Authors: Cheung, Anthony;Chen, Tammy;Rivero, Rachel;Hartman-Joshi, Kristin;Cohen, Michael B. and Levi, Jessica R.

Publication Date: 2022

Journal: Ear & Hearing 43(2), pp. 577-581

Abstract: OBJECTIVES: Neonatal intensive care unit (NICU) patients are at high risk for congenital hearing loss. Previous studies have found sociodemographic factors associated with loss to follow-up for newborn hearing screening, but none have specifically studied the NICU population. Our objective is to determine if demographics and socioeconomic status is associated with loss to follow-up in a newborn population with extended NICU stay. DESIGN: A retrospective cohort study was conducted on 443 NICU infants with extended NICU stay utilizing data extracted from infant and maternal medical records at an urban safety-net hospital. RESULTS: Younger maternal age (adjusted odds ratio [OR] 0.95, confidence interval [CI] 0.91 to 0.99), higher gravidity (adjusted OR 1.39, CI 1.12 to 1.72), and former smoking status (adjusted OR 2.57, CI 1.07-6.18) were identified as independent predictors of loss to follow-up for NHS after conducting a multivariable logistic regression. Demographic and socioeconomic variables, such as sex, parity, birth weight, mode of birth, highest level of maternal education, maternal race/ethnicity, zip code metrics, and maternal language were not found to be associated with loss to follow-up. CONCLUSIONS: Maternal age, gravidity, and smoking status are risk factors for loss to follow-up for NHS in newborns with extended NICU stay, a group at high risk for hearing loss.

Our findings demonstrate that socioeconomic and demographic factors for loss to follow-up in the extended-stay NICU population are distinct from the well-baby population. Further investigation of these patients will allow prioritization of limited resources to subgroups within the extended-stay NICU population at risk for loss to follow-up for newborn hearing screening.

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9. **Prognostic Value of Early Magnetic Resonance Imaging Patterns in Sudden Hearing Loss.**

Item Type: Journal Article

Authors: Conte, Giorgio;Di Berardino, Federica;Mastrapasqua, Rodolfo Francesco;Casale, Silvia;Scola, Elisa;Capaccio, Pasquale;Triulzi, Fabio;Pignataro, Lorenzo and Zanetti, Diego

Publication Date: 2022

Journal: Audiology & Neuro-Otology 27(1), pp. 64-74

Abstract: INTRODUCTION: Sudden sensorineural hearing loss (SSHL) is a relatively frequent disease, but a sensitive marker or a reliable test to identify the underlying cause is still unavailable. Neuroradiology appears to offer the most promising tools, especially magnetic resonance imaging (MRI). In a recent study from our group, we explored the ability of MRI to detect subtle changes in the inner ear compartments by means of a 3D-fluid-attenuated inversion recovery sequence, aiming at identifying 3 distinct MRI patterns (haemorrhagic, inflammatory, brain-labyrinth barrier breakdown). In the present study, we contrasted the MRI patterns at onset with relevant prognostic factors, with the audiological features of each patient's SSHL and with treatment outcomes. METHODS: In this retrospective study, we enrolled 50 adult subjects (54.61 +/- 18.26 years) with SSHL. They underwent an MRI within 72 h from admission, and 5 audiological evaluations: at admission, on the 5th day after the start of medical therapy, at the end of the first cycle of hyperbaric oxygen therapy, then 1 and 6 months later. RESULTS: Abnormalities of the MRI signal and/or post-contrast enhancement asymmetry of the cochlea ("pattern+ MRI") correlated with worse audiological outcomes at 1 month, but the different MRI patterns were not correlated with any specific prognostic model, despite rigid protocol settings. However, a significant difference was found for low-tone SSHL, which were always "pattern" negative at MRI ($p = 0.01$), and for profound SSHL which demonstrated a pattern+ MRI in 80% ($p = 0.04$). At the onset of SSHL, a pattern+ MRI was found in 29/50 cases (58.0%) and was related with lesser degree of recovery of pure-tone average at 1 month and lesser chance to retain the hearing threshold benefit in the long term. Given the limited numbers of patients enrolled so far, the relative impact of comorbidities on each MRI pattern remains uncertain. At 6 months, we observed a trend of greater and more stable recovery ($p = 0.023$) and less frequent recurrence of SSHL in patients with a normal MRI. CONCLUSIONS: The 3 observed MRI patterns did not correlate consistently with specific audio-vestibular features or any peculiar aspect of the patient's clinical history. Larger series of patients with SSHL are needed, possibly from multicentric studies. Copyright © 2021 S. Karger AG, Basel.

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74&date=2022&title=Audiology+%26+Neuro-Otology&atitle=Prognostic+Value+of+Early+Magnetic+Resonance+Imaging+Patterns+in+Sudden+Hearing+Loss.&aulast=Conte&pid=%3Cauthor%3EConte+G%3BDi+Berardino+F%3BMastrapasqua+RF%3BCasale+S%3BScola+E%3BCapaccio+P%3BTriulzi+F%3BPignataro+L%3BZanetti+D%3C%2Fauthor%3E%3CAN%3E33895732%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

10. **Diotic and Antiphasic Digits-in-noise Testing as a Hearing Screening and Triage Tool to Classify Type of Hearing Loss.**

Item Type: Journal Article

Authors: De Sousa, Karina C.;Smits, Cas;Moore, David R.;Myburgh, Hermanus C. and Swanepoel, De Wet

Publication Date: 2022

Journal: Ear & Hearing 43(3), pp. 1037-1048

Abstract: OBJECTIVES: The digits-in-noise test (DIN) is a popular self-test measure that has traditionally been used to screen for hearing loss by providing either a pass or refer result. Standard approaches either tested each ear monaurally or used a binaural diotic version where identical digits and noise were presented simultaneously to both ears. Recently, a dichotic, antiphasic version was developed, increasing sensitivity of the DIN to unilateral or asymmetric sensorineural hearing loss (SNHL) and conductive hearing loss (CHL). The purpose of this study was to determine predictors and normative ranges of the antiphasic and diotic DIN and to determine if a combination of diotic and antiphasic DIN could accurately categorize hearing into (1) normal, (2) bilateral SNHL, or (3) unilateral SNHL or CHL. DESIGN: The analytical sample consisted of 489 participants between the ages of 18 and 92 years with varying types, symmetry, and degrees of hearing loss. Degree and type of hearing loss were determined based on standard clinical four-frequency (0.5-4 kHz) pure-tone air and bone conduction threshold averages. The sample consisted of bilateral normal hearing (n = 293), bilateral SNHL (n = 172), unilateral SNHL (n = 42), and CHL (n = 32). All participants (n = 489) first completed an antiphasic DIN (digit stimuli 180degree out-of-phase between ears), while 393 of the sample also completed a diotic DIN. Two procedures were assessed for their ability to categorize hearing into one of the three hearing groups. The first used a fixed antiphasic cutoff combined with a cutoff formed by a linear combination of antiphasic and diotic speech recognition threshold (SRT) or binaural intelligibility-level difference. RESULTS: Poorer ear pure-tone average was the strongest predictor of antiphasic DIN score, whereas better ear pure-tone average explained more of the variance in diotic SRT. The antiphasic DIN sensitivity and specificity was 90% and 84%, respectively, for detecting hearing loss, with outstanding area under the receiver operating characteristics values exceeding 0.93 to identify hearing loss in the poorer ear. The first fixed SRT cutoff procedure could categorize 75% of all participants correctly, while the second procedure increased correct categorization to 79%. False negative rates for both procedures were below 10%. CONCLUSIONS: A sequential antiphasic and diotic DIN could categorize hearing to a reasonable degree into three groups of (1) normal hearing; (2) bilateral SNHL; and (3) unilateral asymmetric SNHL or CHL. This type of approach could optimize care pathways using remote and contactless testing, by identifying unilateral SNHL and CHL as cases requiring medical referral. In contrast, bilateral SNHL cases could be referred directly to an audiologist, or nontraditional models like OTC hearing aids. Copyright © 2021 Wolters Kluwer Health, Inc. All rights reserved.

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11. **Modified Power Piston Versus Simultaneous Stapedotomy With Hearing Aids in Otosclerosis: A Follow-Up Study Exploring Speech Recognition, Quality of Life and Usage of Device.**

Item Type: Journal Article

Authors: Dejaco, Daniel;Riedl, David;Cassar, Anna Elisabeth;Gottfried, Timo;Rasse, Thomas;Fischer, Natalie;Kreuzer-Simonyan, Armina;Seebacher, Josef;Riechelmann, Herbert;Keintzel, Thomas and Schmutzhard, Joachim

Publication Date: Apr 01 ,2022

Journal: Otology & Neurotology 43(4), pp. 429-436

Abstract: OBJECTIVE: To compare audiologic outcomes, quality-of-life (QoL) and usage-of-device (UoD) between case-matched, otosclerotic patients with mixed hearing loss (MHL) which received (a) stapedotomy and postoperative amplification with hearing aids (SDT+HA) or (b) short-incudial process coupled active middle ear implant with simultaneous stapedotomy (mPP). STUDY DESIGN, SETTING, AND PATIENTS: Prospective, matched case-control, follow-up study conducted at two tertiary otologic referral centers. Eligible were all otosclerotic patients with MHL, which received mPP at either of the two institutions. A case-matched-cohort of SDT+HA-patients was generated from the hospitals database based on preoperative audiologic findings. MAIN OUTCOME MEASURES: For sound- and speech perception, primary outcome parameters were the mean postoperative, aided air-conduction pure tone average (mpa-AC-PTA) and word recognition score at 80 dB speech level (mpa-WRS), for QoL the mean Nijmegen-Cochlear-Implant-Questionnaire (NCIQ) total-score, and for UoD the mean score rated on a 10-point Likert-scale. RESULTS: A total of 28 patients were included; 14 received mPP; mpa-AC-PTA and mpa-WRS significantly improved from 47.1 dB-HL to 34.3 dB-HL (-12.8 dB-HL; p 0.1). NCIQ total-score between groups did not significantly differ (70.4 vs. 69.9; p = 0.93). UoD for mPP was significantly higher (6.1 vs. 3.0; p 0.1). NCIQ total-score between groups did not significantly differ (70.4 vs. 69.9; p = 0.93). UoD for mPP was significantly higher (6.1 vs. 3.0; p

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12. **Clinical Practice Patterns of Fitting Advanced Device Features in Children With Cochlear Implants.**

Item Type: Journal Article

Authors: Findlen, Ursula M.;Benedict, Jason and Agrawal, Smita

Publication Date: 2022

Journal: Journal of Speech Language & Hearing Research 65(2), pp. 797-815

Abstract: PURPOSE: The purpose of this study was to identify common clinical practice patterns for providing advanced noise management features in children with cochlear implants (CIs) and evaluate trends in consideration of clinician experience and comfort with CI manufacturer-specific technology. METHOD: A mixed-model survey including quantitative and qualitative questions regarding providing advanced noise management features in the pediatric CI population was collected electronically via research electronic data capture. Survey questions spanned approach/philosophy toward provision of features, age of provision, and demographics of respondents. Descriptive statistics were completed to define common clinical practice patterns and demographic information. RESULTS: A total of 160 pediatric audiologists from 35 U.S. States and five Canadian provinces completed the survey. Most audiologists (73.8%) reported enabling automatic directional microphones, and a vast majority (91%) reported enabling advanced noise processing features such as automatic noise cancellers, wind noise cancellers, and impulse noise cancellers in recipients' main programs. Audiologists ranked features in terms of importance for a school-age child with the top three ranked as automatic noise reduction, automatic directional microphones, and concha-level microphones. Importance of child-specific factors varied depending upon the specific feature of interest. CONCLUSIONS: Variability exists among providers in enabling advanced noise management features for pediatric CI recipients. Multiple factors, including patient characteristics, provider characteristics, and limited evidence-based guidance, could account for much of the variation. Overall, there is a trend toward automaticity for noise management. Additional studies are warranted to provide the evidence base for confidently programming advanced features for children using CIs.

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13. **Early surgical and audiologic outcomes of active, transcutaneous, osseointegrated bone-conduction hearing device (Osia 2 R system) placement.**

Item Type: Journal Article

Authors: Florentine, Michelle M.;Virbalas, Jordan and Chan, Dylan K.

Publication Date: May ,2022

Journal: International Journal of Pediatric Otorhinolaryngology 156, pp. 111114

Abstract: OBJECTIVE: To assess the outcomes of pediatric Osia 2 R System placements. METHODS: We performed a retrospective chart review of primary and revision Osia 2 R System surgical cases at two tertiary academic children's hospitals. Operative details and post-operative surgical and audiologic outcomes were recorded. RESULTS: 18 cases were performed on 14 children (mean age: 11.5 years, range 7-16) and included 9 primary surgeries and 9 revisions from BAHA Attract R, Connect R and Sophono R implants. Surgical planning for revision surgeries was complex due to prior incisions, implants, and bony contour. Post-operative aided audiograms revealed pure tone average (0.5-4 kHz) of 26.2 +/- 2.5 dB HL (mean +/- SD), with no high frequency roll-off (8 kHz aided threshold: 23.8 +/- 7.5 dB HL). Two minor post-operative complications were identified. CONCLUSION: Bone-conduction hearing devices (BCHDs) are used to improve access to sound for children with conductive hearing loss, single-sided deafness, and aural atresia. Traditional passive, percutaneous abutment-based and transcutaneous magnet-based surgical BCHDs can be limited by skin complications and high-frequency acoustic attenuation. Recent availability of active, transcutaneous osseointegrated BCHD systems presents potential for improvement on both of these traditional limitations. Initial experience with the Osia 2 R

System demonstrates overall successful, uncomplicated placement with excellent audiologic outcomes. Revision cases require careful surgical planning. Further follow-up and comparative studies with other BCHDs are necessary to fully evaluate the effectiveness of the Osia 2 R System.

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14. **Clinical Practice Patterns With Pediatric Loudness Perception Measures.**

Item Type: Journal Article

Authors: Flores, Ashley N. and Gustafson, Samantha J.

Publication Date: Mar 03 ,2022

Journal: American Journal of Audiology 31(1), pp. 175-188

Abstract: PURPOSE: Obtaining a patient's loudness discomfort level (LDL) can assist the audiologist in defining their dynamic range so that the hearing device fitting can ensure that low-level sounds are audible, average-level sounds are comfortable, and more intense sounds are loud but not too loud. A 2016 survey showed that 67.5% of 350 pediatric audiologist reported to never or rarely measure LDLs with pediatric patients. The purpose of this study was to identify factors influencing this previously reported limited use of LDL measures. METHOD: Sixty-two pediatric audiologists in the United States were surveyed using a questionnaire that sought to improve our understanding of the (non)use of loudness perception measures with pediatric patients and to assess familiarity with various loudness perception measurements. In addition, the questionnaire gathered information about the needs of pediatric audiologists in relation to LDL measures. RESULTS: Audiologist report being largely unfamiliar with methods of assessing loudness perception in children, with categorical loudness scaling being the method with which they are most familiar. In addition, audiologists reported being more willing and able to measure LDLs in older compared to younger pediatric patients. Limited use of pediatric loudness perception measures appears to be driven by a lack of familiarity with measurement methods and the belief that loudness perception measures may not be useful for clinical practice. CONCLUSIONS: Findings highlight audiologists' need for further information regarding the relevance of loudness perception measurements with pediatric patients and the need for easy-to-implement LDL measurement procedures for pediatric patients of all ages.

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15. **Delivery of remote otology care: a UK pilot feasibility study.**

Item Type: Journal Article

Authors: Forde, Cillian T.;Dimitrov, Lilia;Doal, Suneal;Patel, Jay;Clare, Dawn;Burslem, Michael;Mehta, Nishchay and Manjaly, Joseph G.

Publication Date: 2022

Journal: BMJ Open Quality 11(1), pp. 02

Abstract: INTRODUCTION: The COVID-19 pandemic has catalysed the need to implement the National Health Service Long-Term Plan to deliver more care in the community and to reduce face-to-face hospital appointments by up to 33%. This study aimed to assess the feasibility of a remote otology service from triage through to delivery. METHODS: New adult otology referrals at a tertiary ear, nose and throat (ENT) hospital aged between 18 and 70 with hearing loss or tinnitus were included. Patients attended an audiology-led community clinic where they underwent a focused history, audiometric testing, and a smartphone-based application and otoscope (Tympa System) was used to capture still and video images of their eardrums. The information was reviewed by ENT clinicians using a remote review platform with a subset of patients subsequently undergoing an in-person review to measure concordance between the two assessments. RESULTS: 58 patients participated. 75% of patients had their pathways shortened by one hospital visit with 65% avoiding any hospital attendances. 24% required an additional face-to-face appointment due to incomplete views of the tympanic membrane or need for additional examinations. Electronic validation by a blinded consultant otologist demonstrated a diagnosis concordance of 95%, and concordance between remote-review and in-person consultations in the 12 patients who agreed to attend for an in-person review was 83.3%. 98% of patients were satisfied with the pathway. CONCLUSION: This pilot service is feasible, safe and non-inferior to the traditional outpatient model in the included patient group. There is potential for the development of a community audiology-led service or use for general practioner advice and guidance.

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16. **OPRA-RS: A Hearing-Aid Fitting Method Based on Automatic Speech Recognition and Random Search.**

Item Type: Journal Article

Authors: Goncalves Braz, Libio;Fontan, Lionel;Pinquier, Julien;Stone, Michael A. and Fullgrabe, Christian

Publication Date: 2022

Journal: Frontiers in Neuroscience 16, pp. 779048

Abstract: Hearing-aid (HA) prescription rules (such as NAL-NL2, DSL-v5, and CAM2) are used by HA audiologists to define initial HA settings (e.g., insertion gains, IGs) for patients. This initial fitting is later individually adjusted for each patient to improve clinical outcomes in terms of speech intelligibility and listening comfort. During this fine-tuning stage, speech-intelligibility tests are often carried out with the patient to assess the benefits associated with different HA settings. As these tests tend to be time-consuming and performance on them depends on the patient's level of fatigue and familiarity with the test material, only a limited number of HA

settings can be explored. Consequently, it is likely that a suboptimal fitting is used for the patient. Recent studies have shown that automatic speech recognition (ASR) can be used to predict the effects of IGs on speech intelligibility for patients with age-related hearing loss (ARHL). The aim of the present study was to extend this approach by optimizing, in addition to IGs, compression thresholds (CTs). However, increasing the number of parameters to be fitted increases exponentially the number of configurations to be assessed. To limit the number of HA settings to be tested, three random-search (RS) genetic algorithms were used. The resulting new HA fitting method, combining ASR and RS, is referred to as "objective prescription rule based on ASR and random search" (OPRA-RS). Optimal HA settings were computed for 12 audiograms, representing average and individual audiometric profiles typical for various levels of ARHL severity, and associated ASR performances were compared to those obtained with the settings recommended by CAM2. Each RS algorithm was run twice to assess its reliability. For all RS algorithms, ASR scores obtained with OPRA-RS were significantly higher than those associated with CAM2. Each RS algorithm converged on similar optimal HA settings across repetitions. However, significant differences were observed between RS algorithms in terms of maximum ASR performance and processing costs. These promising results open the way to the use of ASR and RS algorithms for the fine-tuning of HAs with potential speech-intelligibility benefits for the patient. Copyright © 2022 Goncalves Braz, Fontan, Pinquier, Stone and Fullgrabe.

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17. **Cochlear Implantation in Elderly Patients: Survival Duration, Hearing Outcomes, Complication Rates, and Cost Utility.**

Item Type: Journal Article

Authors: Hammond-Kenny, Amy;Borsetto, Daniele;Manjaly, Joseph G.;Panova, Tsvetemira;Vijendren, Ananth;Bance, Manohar;Tysome, James R.;Axon, Patrick R. and Donnelly, Neil P.

Publication Date: 2022

Journal: Audiology & Neuro-Otology 27(2), pp. 156-165

Abstract: INTRODUCTION: The prevalence of hearing loss and its consequences is increasing as the elderly population grows. As the guidelines for cochlear implantation (CI) expand, the number of elderly CI recipients is also increasing. We report complication rates, survival duration, and audiological outcomes for CI recipients aged 80 years and over and discuss the cost utility of CI in this age group. METHODS: A retrospective cohort study was undertaken of all CI recipients (126 cases), aged 80 years and over at the time of their surgery, implanted at our institution (Cambridge University Hospitals) during a period from January 1, 2001, to March 31, 2019. Data on survival at 1, 3, and 5 years post-implantation, post-operative complications and functional hearing outcomes including audiometric and speech discrimination outcomes (Bamford-Kowal-Bench sentence test) have been reported. RESULTS: The mean age at implantation was 84 years. The mean audiometric score improved from 108 dB HL to 28 dB HL post-implantation. The mean Bamford-Kowal-Bench score improved from 14% to 66% and 73% at 2 and 12 months post-implantation, respectively. The complication rate was 15.3%. The survival probability at 1 year post-implantation was 0.95 for females and 0.93 for males, at 3 years was 0.89 for females and 0.81 for males, and at 5 years was 0.74 for females and 0.54 for males. CONCLUSION: CI is safe and well-tolerated in this age group and elderly patients gain similar audiometric and functional benefit as found for

younger age groups. Copyright © 2021 S. Karger AG, Basel.

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18. **Association of Bone Conduction Devices for Single-Sided Sensorineural Deafness With Quality of Life: A Systematic Review and Meta-analysis.**

Item Type: Journal Article

Authors: Hampton, Thomas;Milinis, Kristijonas;Whitehall, Emma and Sharma, Sunil

Publication Date: 2022

Journal: JAMA Otolaryngology-- Head & Neck Surgery 148(1), pp. 35-42

Abstract: Importance: Although bone conduction devices (BCDs) have been shown to improve audiological outcomes of patients with single-sided sensorineural deafness (SSD), their effects on the patients' quality of life (QOL) are unclear. Objective: To investigate the association of BCDs on QOL in patients with SSD. Data Sources: Literature search of databases (Medline, Embase, Cochrane Library, and ClinicalTrials.gov) from January 1, 1978, to June 24, 2021, was performed. Study Selection: Prospective interventional studies with 10 or more participants with SSD (defined as pure tone average >70 dB hearing loss in the worse hearing ear and <=30 dB in the better hearing ear) who underwent unilateral BCD implantation and assessment of QOL before and after the intervention using a validated tool were eligible for inclusion. Studies on adults and children were eligible for inclusion. Patients with only conductive, mixed, or bilateral hearing loss were excluded. Data Extraction and Synthesis: Data were extracted by 2 independent reviewers. Study clinical and demographic characteristics were obtained. Meta-analysis of mean differences in QOL scores before and after the intervention was performed. Study bias was assessed using Joanna Briggs Institute risk of bias tool. Main Outcomes and Measures: The main study outcome was mean change in QOL scores at 6 months after insertion of BCDs. The 3 QOL instruments used in the studies included the Abbreviated Profile of Hearing Aid Benefit (APHAB), the Health Utilities Index-3 (HUI-3), and the Speech, Spatial and Qualities of Hearing Scale (SSQ). The APHAB and the SSQ are the hearing-related QOL measures, whereas the HUI-3 is a generic QOL measure. Results: A total of 486 articles were identified, and 11 studies with 203 patients met the inclusion criteria. Only adult studies met inclusion criteria. Ten of 11 studies were nonrandomized cohort studies. The BCDs assessed were heterogeneous. There was a significant statistical and clinically meaningful improvement in the global APHAB scores (mean change, 15.50; 95% CI, 12.63-18.36; I2 = 0) and the SSQ hearing qualities (mean change, 1.19; 95% CI, 0.46-1.92; I2 = 78.4%), speech (mean change, 2.03; 95% CI, 1.68-2.37; I2 = 0), and spatial hearing (mean change, 1.51; 95% CI, 0.57-2.44; I2 = 81.1%) subscales. There was no significant change detected in the mean HUI-3 scores (mean change, 0.03; 95% CI, -0.04 to 0.10; I2 = 0). The risk of bias was assessed to be low to moderate. Conclusions and Relevance: These findings suggest that adult patients who receive BCDs may experience improvements in hearing-specific QOL measures but not in generic QOL measures. Prospective QOL studies should be considered in this cohort, particularly for children with SSD.

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19. **Real-World Effectiveness of Wearable Augmented Reality Device for Patients With Hearing Loss: Prospective Study.**

Item Type: Journal Article

Authors: Han, Ul Gyu;Lee, Jung-Yup;Kim, Ga-Young;Jo, Mini;Lee, Jaeseong;Bang, Kyoung Ho;Cho, Young Sang;Hong, Sung Hwa and Moon, Il Joon

Publication Date: Mar 23 ,2022

Journal: JMIR MHealth and UHealth 10(3), pp. e33476

Abstract: BACKGROUND: Hearing loss limits communication and social activity, and hearing aids (HAs) are an efficient rehabilitative option for improving oral communication and speech comprehension, as well as the psychosocial comfort of people with hearing loss. To overcome this problem, over-the-counter amplification devices including personal sound amplification products and wearable augmented reality devices (WARDs) have been introduced. OBJECTIVE: This study aimed to evaluate the clinical effectiveness of WARDs for patients with mild to moderate hearing loss. METHODS: A total of 40 patients (18 men and 22 women) with mild to moderate hearing loss were enrolled prospectively in this study. All participants were instructed to wear a WARD, Galaxy Buds Pro (Samsung Electronics), at least 4 hours a day for 2 weeks, for amplifying ambient sounds. Questionnaires including the Korean version of the abbreviated profile of hearing aid benefit (K-APHAB) and the Korean adaptation of the international outcome inventory for hearing aids (K-IOI-HA) were used to assess personal satisfaction in all participants. Audiologic tests, including sound field audiometry, sound field word recognition score (WRS), and the Korean version of hearing in noise test (K-HINT), were administered to 14 of 40 patients. The tests were performed under two conditions: unaided and aided with WARDs. RESULTS: The mean age of the participants was 55.4 (SD 10.7) years. After 2 weeks of the field trial, participants demonstrated a benefit of WARDs on the K-APHAB. Scores of 3 subscales of ease of communication, reverberation, and background noise were improved significantly (P Copyright ©Ul Gyu Han, Jung-Yup Lee, Ga-Young Kim, Mini Jo, Jaeseong Lee, Kyoung Ho Bang, Young Sang Cho, Sung Hwa Hong, Il Joon Moon. Originally published in JMIR mHealth and uHealth (https://mhealth.jmir.org), 23.03.2022.

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20. **Cochlear Implant Outcomes in CHARGE Syndrome: Updated Perspectives.**

Item Type: Journal Article

Authors: Kay-Rivest, Emily;McMenomey, Sean O.;Jethanamest, Daniel;Roland, J. Thomas Jr;Shapiro, William H.;Waltzman, Susan B. and Friedmann, David R.

Publication Date: 2022

Journal: Otology & Neurotology
Abstract: OBJECTIVE: To evaluate outcomes of auditory implants in children with CHARGE syndrome and describe the evolution in management of hearing loss in this complex population. METHODS: A retrospective case review was performed at a tertiary referral center. Children with CHARGE syndrome who received either a cochlear implant (CI) or auditory brainstem implant (ABI) were included. Clinical records, demographic information, CHARGE features, neuroimaging, audiology, hearing rehabilitation interventions, operative notes, and outcomes were reviewed. RESULTS: Thirteen children with CHARGE syndrome underwent a total of 19 cochlear implants between 2008 and 2020. Among the congenitally deafened children (n = 9), six underwent bilateral implantation (five simultaneous and one sequential). Bilateral implantation was performed even in the presence of diminutive-appearing cochlear nerves. The average age of implantation was 1.1 years, and the mean device use time was 9.4 hours per day. Patients showed improvements in subjective family assessment related to hearing. In this group, two patients use oral communication, five use total communication, and two use sign language exclusively. Among the children with progressive hearing loss, the mean age of hearing deterioration was 4.4 years of age, and the device use time on average was 9.8 hours per day. The highest performer in the cohort was a child who lost hearing in their only hearing ear at age 4 and had normal cochleovestibular anatomy on that side. One child received an auditory brainstem implant at age two after deriving no benefit from a CI and can detect environmental sounds but is currently a nonuser. Over time, we noted that implantation occurred earlier in life and that practice has shifted toward bilateral implantation. CONCLUSIONS: Compared to a previous institutional cohort, children evaluated in this study were often implanted at a younger age and bilaterally with significantly improved outcomes. A CI evaluation should be considered in children with CHARGE syndrome to maximize sensory input and auditory ability. Copyright © 2022 by Otology & Neurotology, Inc. Image copyright © 2010 Wolters Kluwer Health/Anatomical Chart Company.

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21. **Feasibility of Personal Sound Amplification Products in Patients With Moderate Hearing Loss: A Pilot Study.**

Item Type: Journal Article

Authors: Kim, Ga-Young;Kim, Jong Sei;Jo, Mini;Seol, Hye Yoon;Cho, Young Sang and Moon, Il Joon

Publication Date: Feb ,2022

Journal: Clinical & Experimental Otorhinolaryngology 15(1), pp. 60-68

Abstract: OBJECTIVES: This study was conducted to investigate the electroacoustic characteristics of personal sound amplification products (PSAPs), to identify whether PSAPs provide adequate gain and output for three

common hearing loss (HL) configurations, and to compare the benefits of a representative PSAP (RPSAP) and a conventional hearing aid (HA) for clinical hearing outcomes as a pilot study. METHODS: The study comprised three phases: electroacoustic analysis, simulated real-ear measurements (REMs), and clinical hearing experiments. Electroacoustic analysis and simulated REMs were performed for three basic PSAPs (BeethoSOL, EarJJang, and Geniesori2) and three high-end PSAPs (Hearing Able, Olive Smart Ear, and SoriIn) using the Aurical Hearing Instrument Test box with a 2-mL coupler. Four electroacoustic characteristics (maximum output sound pressure level at 90 dB SPL, frequency range, equivalent input noise, and total harmonic distortion) were investigated. By simulated REMs, appropriate levels of the six PSAPs for three common HL configurations (mild-to-moderate high-frequency HL, moderate to moderately severe sloping HL, and moderate flat HL) were determined. Clinical experiments compared the performance of RPSAP to HA, both of which were fitted by audiologists using REMs. Clinical experiments were administered using functional gain, a word recognition test, and the Korean version of the Hearing in Noise Test in six participants with bilateral moderate sensorineural HL. RESULTS: The two high-end devices met all tolerances. One basic and two high-end PSAPs showed appropriate levels for three common HL configurations. In the clinical experiments, the RPSAP showed better performance than unaided, but slightly worse than HA under all test conditions. CONCLUSION: Certain PSAPs met all specified tolerances for electroacoustic analysis and approximated prescriptive targets in well-controlled laboratory conditions. The pilot clinical experiments explored the possibility that the RPSAP could serve as a hearing assistive device for patients with moderate HL.

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22. **Molecular aetiology of ski-slope hearing loss and audiological course of cochlear implantees.**

Item Type: Journal Article

Authors: Kim, Yehree;Han, Jin Hee;Yoo, Hyo Soon and Choi, Byung Yoon

Publication Date: 2022

Journal: European Archives of Oto-Rhino-Laryngology
Abstract: PURPOSE: A challenge for patients with ski-slope hearing loss is that hearing aids do not adequately amplify the mid-to-high frequencies necessary for speech perception and conversely, cochlear implant (CI) may damage low-frequency hearing. We aimed to describe the clinical profile of patients with ski-slope hearing loss, with a special focus on aetiology of such hearing loss and audiological course of low-frequency hearing after CI. METHODS: We recruited hearing-impaired patients who visited a tertiary referral centre and met the criteria for ski-slope hearing loss patients from 2015 to 2021. Genetic testing was performed in all ski-slope hearing loss patients unless refused. Baseline audiograms of patients who continued to use hearing aids or who finally underwent CIs were reviewed. As for CI patients, outcome and hearing preservation rate were rigorously analysed. RESULTS: Of 46 recruited patients with ski-slope hearing loss, 45 agreed to undergo genetic testing and causative variants were identified in 17 (37.8%) patients. The TMC1, MYO7A, and TMPRSS3 variants were the most common, while LRTOMT was newly identified as a causative gene. Twenty-five patients eventually received CI, while 13 continued to wear the hearing aid and 8 patients did not ever try hearing aids. CI in ski-slope hearing loss led to immediate and sufficient improvement of sentence recognition by as early as 3 months, however, the duration of hearing loss was inversely correlated with the sentence recognition score. The average hearing preservation rate (using the HEARRING classification) after CI was 53.0% (SD 30.0) and 45.6% (SD 31.1) at 1 year. Seventy-nine percent of implantees maintained functional low-frequency hearing

(better than 85 dB at 250 and 500 Hz) eligible for electric-acoustic stimulation (EAS). A trend was found that patients with hair cell stereocilia-associated genetic variants may have a slightly better preservation, albeit with no statistical significance. CONCLUSION: Detection rate of a molecular genetic aetiology of ski-slope hearing loss appears to be lower than other type of hearing loss reported in the literature. Especially with short hearing loss duration, CI in ski-slope hearing loss leads to immediate and sufficient speech improvement, while preserving functional low-frequency hearing eligible for EAS as many as in 79%. A certain genetic aetiology might be associated with a trend towards better low-frequency hearing preservation. Copyright © 2022. The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

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23. **Deaf women's experiences of maternity and primary care: An integrative review**

Item Type: Journal Article

Authors: Luton, Meghan;Allan, Helen T. and Kaur, Herminder

Publication Date: 2022

Journal: Midwifery 104, pp. N.PAG

Abstract: • A large number of people in the UK (> 24,000) report using British Sign Language (BSL) as their first language. Their access to health information is very poor and health professionals do not understand their health needs. • Pregnancy, birth and postnatal outcomes for deaf women can be affected by a lack of understanding and recognition of their maternity needs. • Our literature review shows that deaf women may avoid seeking care, may have a lack of access to health information and healthcare providers may have a lack of deaf awareness. • Current care provisions do not always meet the needs of the deaf BSL using women. Health professionals need awareness of deafness as a culture and how to best meet the needs of the community to improve health outcomes for women and their babies. An estimated 24,000 people in the UK report using British Sign Language (BSL) as their first language. Misconceptions about deaf culture and language mean that deaf people have less access to health information and their health literacy is lower. Deaf people's health needs go under the radar in primary care with ensuing poorer health outcomes. Deaf women's experiences of maternity care are poorly understood. Using Whittemore and Knafl's method for an integrative review, the following databases were searched: EMBASE, MedLine, CINAHL and Maternity and Infant Care. After reviewing 430 journal article titles and abstracts against the inclusion/exclusion criteria, 11 articles were included for final review. Selected studies were conducted internationally and were available in English. 10 were qualitative studies, 1 used survey design. They were reviewed using the Caldwell Framework. These show that deaf women avoid seeking care, have a lack of access to health information and healthcare providers, including midwives, have a lack of deaf awareness. For deaf women, during pregnancy, birth and postnatal periods, this can mean having longer hospital stays and more complex postnatal care needs in both the hospital and community setting. Current care provisions do not always meet the needs of the deaf BSL using women who use maternity services. Midwives should be aware of deafness as a culture and how to best meet the needs of the community to improve health outcomes for women and their babies.

DOI: https://libkey.io/10.1016/j.midw.2021.103190

24. **The audiovestibular manifestations as early symptoms of multiple sclerosis: a scoping review of the literature**

Item Type: Journal Article

Authors: MacMahon, Helen and El Refaie, Amr

Publication Date: Feb ,2022

Journal: Irish Journal of Medical Science 191(1), pp. 391-400

Abstract: BACKGROUND: Multiple sclerosis (MS) is an immune-mediated, demyelinating disease of the nervous system, which may impact the audiovestibular pathway at different stages of the disease. The auditory and vestibular manifestations of MS as a presenting or early symptom are an area in which more investigation is needed. AIMS: The aim of this review is to determine the auditory and vestibular symptoms, which may occur at the presenting stage of multiple sclerosis. This clinical knowledge will allow a clinician to facilitate early diagnosis and intervention of MS through appropriate onward referral. Audiological and vestibular test results, as well as magnetic resonance imagery results, will also be examined to try to determine the impact of MS on the auditory and vestibular pathways. METHODS: A scoping search of the electronic databases PubMed, Scopus, Web of Science, ScienceDirect, and EBSCO was conducted in March 2020 to obtain studies specifically of patients with audiovestibular symptoms at the early or presenting stages of multiple sclerosis. Data was extracted from studies which met the inclusion criteria and studies were subsequently critically appraised and assessed for risk of bias. RESULTS: Eighteen papers met the inclusion criteria for this study. Results of the study found that the most common audiovestibular manifestation as a presenting symptom of MS was unilateral, moderate-profound, fluctuating, and sudden sensorineural hearing loss across all frequencies (250 Hz-8000 Hz). Other symptoms include tinnitus, balance abnormalities, aural pain and aural fullness, which may accompany SSHL or occur independently. The peripheral involvement of the immune-mediated mechanisms of MS was suggested by peripheral findings in vestibular examination results and the involvement of wave I ABR in patients with irreversible hearing loss. Demyelinating lesions associated with MS were suggested by results obtained from evoked potentials measurements, including ABR, VEMPs, and MLR. CONCLUSION: An understanding of the sensitivity of evoked potentials in the detection of demyelinating lesions as well as the most common audiovestibular presentations of the disease allows the practitioner to provide an appropriate onward referral for MRI which may lead to early diagnosis and intervention of MS. We suggest that there is enough evidence to include evoked potentials complementary to MRI in the detection and monitoring of MS. As the review suggests evidence of involvement of the immune-mediated mechanisms of MS on peripheral structures like the inner ear, further clinical research is recommended to explore this mechanism. Key points 1. The most common audiovestibular manifestation as an early symptom of MS was unilateral moderate to profound SSHL across all frequencies (250 Hz-8000 Hz). 2. Findings of the review indicated the involvement of the immune-mediated mechanisms of MS in the peripheral structures of the inner ear. 3. These findings included peripheral results in the vestibular test of the patients involved in the study and secondly, the three studies which reported an absence of full recovery of hearing loss were also three papers which within their ABR results showed abnormality of wave I 4. This is the first paper to support the theory (Di Stadio et al. 2018) [32] that immune-mediated processes of MS can spread to peripheral inner ear structures 5. The review highlighted the sensitivity of evoked potentials in detecting MS lesions in the presenting stage, particularly ABR which demonstrated that in instances in which hearing loss recovered ABR results remained abnormal.

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400&date=2022&title=Irish+Journal+of+Medical+Science&atitle=The+audiovestibular+manifestations+as+early+symptoms+of+multiple+sclerosis%3A+a+scoping+review+of+the+literature.&aulast=MacMahon&pid=%3Cauthor%3EMacMahon+H%3BEl+Refaie+A%3C%2Fauthor%3E%3CAN%3E33544333%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

25. **A randomised controlled clinical trial to assess the benefits of a telecare tool delivered prior to the initial hearing assessment.**

Item Type: Journal Article

Authors: Maidment, D. W.;Heffernan, E. and Ferguson, M. A.

Publication Date: Apr 18 ,2022

Journal: International Journal of Audiology 1-10
Abstract: OBJECTIVE: To assess the benefits of the Ida Institute's Why improve my hearing? Telecare Tool used before the initial hearing assessment appointment. DESIGN: A prospective, single-blind randomised clinical trial with two arms: (i) Why improve my hearing? Telecare Tool intervention, and (ii) standard care control. STUDY SAMPLE: Adults with hearing loss were recruited from two Audiology Services within the United Kingdom's publicly-funded National Health Service. Of 461 individuals assessed for eligibility, 57 were eligible to participate. RESULTS: Measure of Audiologic Rehabilitation Self-efficacy for Hearing Aids (primary outcome) scores did not differ between groups from baseline to post-assessment (Mean change [DELTA]= -2.28; 95% confidence interval [CI]= -6.70, 2.15, p= .307) and 10-weeks follow-up (Mean DELTA= -2.69; 95% CI= -9.52, 4.15, p = .434). However, Short Form Patient Activation Measure scores significantly improved in the intervention group compared to the control group from baseline to post-assessment (Mean DELTA= -6.06, 95% CI= -11.31, -0.82, p = .024, ES= .61) and 10-weeks follow-up (Mean DELTA= -9.87, 95% CI= -15.34, -4.40, p = .001, ES= -.97). CONCLUSIONS: This study demonstrates that while a patient-centred telecare intervention completed before management decisions may not improve an individual's self-efficacy to manage their hearing loss, it can lead to improvements in readiness.

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26. **Evaluation of Remote Check: A Clinical Tool for Asynchronous Monitoring and Triage of Cochlear Implant Recipients.**

Item Type: Journal Article

Authors: Maruthurkkara, Saji;Case, Sasha and Rottier, Riaan

Publication Date: 2022

Journal: Ear & Hearing 43(2), pp. 495-506

Abstract: BACKGROUND: A new Remote Check App permits remote self-testing of hearing function for Nucleus cochlear implant (CI) recipients and enables asynchronous review by their clinician to support patient-management decisions. OBJECTIVES: To evaluate the Remote Check App for: (1) ease of use; (2) overall

acceptance of the test battery by CI recipient or their carer in the home setting; (3) test-retest reliability of audiological threshold and speech recognition measures via wireless streaming; and (4) to compare outcomes from patient-driven measures with conventional clinician-driven measurements of aided-hearing function. DESIGN: Single-site, prospective, repeated-measures cohort study with 32 experienced CI users (28 adults and 4 children). METHODS: Participants completed self-testing using the Remote Check app at home and in the clinic. Measures include audiological, objective and subjective tests. Self-administered speech recognition in noise, via the digit triplets test (DTT) and aided thresholds, via the aided threshold test (ATT) were reassessed in free-field and by clinicians following conventional clinical protocols. Results of ATT and DTT were compared across test conditions. Completion time and perceived ease of self-driven assessments were documented. Insights from subsequent real-world experience with Remote Check are summarized and compared to the study findings. RESULTS: Remote Check was rated as easy to use by the majority (87%) of subjects. Mean group test-retest score differences for self-administered testing within the clinic versus at-home environments were nonsignificant ($p > 0.05$): 1.4 dB (SD = 1.97) for ATT and 1.6 dB (SD = 1.54) for DTT. Mean group test-retest score difference for patient-driven DTT in streamed versus the free-field condition was 1.8 dB (SD = 2.02). Self-administered, streamed, ATT via Remote Check, resulted in significantly lower thresholds compared to clinician-driven warble-tone thresholds in the free-field by 6.7 dB (SD = 6.8) (p

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27. **Audiological Features in 63 Patients With Cochlear Nerve Deficiency.**

Item Type: Journal Article

Authors: Matsuura, Kazuki;Yoshimura, Hidekane;Shinagawa, Jun;Kurozumi, Masahiro and Takumi, Yutaka

Publication Date: 2022

Journal: Otology & Neurotology 43(1), pp. 23-28

Abstract: OBJECTIVE: We aimed to investigate the clinical features of cochlear nerve deficiency (CND), and in particular, the long-term course of hearing disability and audiogram shapes. STUDY DESIGN: Retrospective observational nonrandomized group study. SETTING: Academic medical center. PATIENTS/INTERVENTIONS: The subjects were 63 children with congenital hearing loss who visited our hospital between 2009 and 2019 and underwent MRI, based on which they were diagnosed with CND. There were 61 cases of unilateral CND and two cases of bilateral CND. MAIN OUTCOME MEASURES: Imaging tests by MRI and CT and audiometric assessments by pure-tone audiometry and distortion product otoacoustic emission were performed. RESULTS: Among the cases of CND diagnosed by assessing the cochlear nerve on MRI, approximately 20% of the bony cochlear nerve canals that could be assessed on CT were normal. Of the 61 cases diagnosed with unilateral CND, 55 cases had cochlear nerve aplasia (90.2%), and six had cochlear nerve hypoplasia (9.8%), with a mean hearing ability of 92.2 and 94.6 dB HL, respectively. Thus, the majority of cases had severe-to-profound hearing loss. The overall audiometric patterns were 78.7% flat, 9.8% cookie-bite, and 9.8% high-frequency. Six of 61 cases (9.8%) had a distortion product otoacoustic emission (DPOAE) response based on the affected side, and none of the cases lost the response during follow-up. CONCLUSIONS: Herein, we report the largest study on CND and performed CND image and audiometric assessments. Accurately in diagnosing CND requires not only CT but also MRI assessment. Hearing loss is often severe to profound; however, various audiometric patterns have been

observed. CND includes a small number of cases that respond to DPOAE, indicating that some CND cases are clinically diagnosed with auditory neuropathy spectrum disorder (ANSD). A sustained DPOAE response might help in differentiating CND from other ANSDs. Children with congenital deafness who have passed the newborn hearing screening by DPOAE should be examined by MRI to rule out CND. Copyright © 2021, Otology & Neurotology, Inc.

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28. **The cumulative incidence of cisplatin-induced hearing loss in young children is higher and develops at an early stage during therapy compared with older children based on 2052 audiological assessments.**

Item Type: Journal Article

Authors: Meijer, Annelot J. M.;Li, Kathy H.;Brooks, Beth;Clemens, Eva;Ross, Colin J.;Rassekh, Sharad R.;Hoetink, Alex E.;van Grotel, Martine;van den Heuvel-Eibrink, Marry M. and Carleton, Bruce C.

Publication Date: 2022

Journal: Cancer 128(1), pp. 169-179

Abstract: BACKGROUND: Ototoxicity is a common adverse event of cisplatin treatment. The authors investigated the development of cisplatin-induced hearing loss (CIHL) over time in children with cancer by age and examined the influence of other clinical characteristics on the course of CIHL. METHODS: Data from Canadian patients with childhood cancer were retrospectively reviewed. Hearing loss was graded according to International Society of Pediatric Oncology criteria. The Kaplan-Meier method was applied to estimate the cumulative incidence of CIHL for the total cohort and according to age. Cox regression models were used to explore the effects of independent variables on CIHL development up to 3 years after the start of therapy. RESULTS: In total, 368 patients with 2052 audiological assessments were included. Three years after initiating therapy, the cumulative incidence of CIHL was highest in patients aged 5 years (48%; 95% CI, 37%-62%; P 5 years (48%; 95% CI, 37%-62%; P 2 increase: hazard ratio [HR], 1.20; 95% CI, 1.01-1.41) vincristine (HR, 2.87; 95% CI, 1.89-4.36) and the total duration of concomitantly administered antibiotics (>30 days: HR, 1.85; 95% CI, 1.17-2.95) further influenced CIHL development over time. CONCLUSIONS: In young children, the cumulative incidence of CIHL is higher compared with that in older children and develops early during therapy. The course of CIHL is further influenced by the total cumulative dose of cisplatin and other ototoxic (co-)medication. These results highlight the need for audiological monitoring at each cisplatin cycle. Copyright © 2021 American Cancer Society.

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29. **Comparison of two disease-specific instruments assessing health-related quality of life in patients with chronic otitis media**

Item Type: Journal Article

Authors: Mlynski, Robert;Bächinger, David;Langanke, Theresa;Lailach, Susen;Neudert, Marcus and Weiss, Nora M.

Publication Date: 2022

Journal: European Archives of Oto-Rhino-Laryngology : Official Journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : Affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery 279(2), pp. 703-711

Abstract: Purpose: Evaluating the current health state in chronic otitis media (COM), audiologic results are complemented by subjective outcomes, such as health-related quality of life (HRQoL). Two disease-specific instruments assessing HRQoL in COM in German-speaking patients exist, i.e., the chronic otitis media outcome test (COMOT-15) and the Zurich chronic middle ear inventory (ZCMEI-21). Since the psychometric properties of these questionnaires in a concurrent application are unknown, the aim of this study was to compare the COMOT-15 and the ZCMEI-21.; Methods: HRQoL was assessed in adult COM patients using the COMOT-15 and the ZCMEI-21. Psychometric properties were determined, including response distribution, concurrent validity, internal consistency, correlation to hearing and gender differences.; Results: In 173 patients (mean age 51.5 years), both questionnaires showed normally distributed scores without strong floor and ceiling effects. The total scores and subscores of both questionnaires exhibited satisfactory internal consistency (Cronbach's α 0.7-0.9) with the exception of the COMOT-15 hearing subscore (α = 0.94) and the ZCMEI-21 medical resource subscore (α = 0.66). Fair correlations between the air conduction pure-tone average and the total scores were found (COMOT-15: r = 0.36, p < 0.0001; ZCMEI-21: r = 0.34, p < 0.0001).; Conclusion: In the first study comparing the COMOT-15 and the ZCMEI-21, both questionnaires exhibited satisfactory psychometric properties with several subtle differences. The COMOT-15 has a strong focus on hearing with a probably redundant content of the hearing subscore and may be suited for hearing-focused research questions. The ZCMEI-21 provides a comprehensive assessment of the COM symptom complex and may therefore also be used in research settings, where ear discharge, vertigo or pain should be covered. (© 2021. The Author(s).)

DOI: https://libkey.io/10.1007/s00405-021-06702-y

30. **Tools for standardized data collection: Speech, Language, and Hearing measurement protocols in the PhenX Toolkit**

Item Type: Journal Article

Authors: Morton, Cynthia C.;Marazita, Mary L.;Peter, Beate;Rice, Mabel L.;Kraft, Shelly Jo;Barkmeier-Kraemer, Julie;Balaban, Carey;Phillips, Michael;Schoden, Jennifer;Maiese, Deborah;Hendershot, Tabitha and Hamilton, Carol M.

Publication Date: 2022

Journal: Annals of Human Genetics 86(1), pp. 45-51

Abstract: The PhenX Toolkit (https://www.phenxtoolkit.org/) is an online catalog of recommended measurement protocols to facilitate cross-study analyses for biomedical research. An expert review panel (ERP) reviewed and updated the PhenX Toolkit Speech and Hearing domain to improve the precision and consistency of speech, language, and hearing disorder phenotypes. A three-member ERP convened in August 2018 to review the measurement protocols in the PhenX Speech and Hearing domain. Aided by three additional experts in voice assessment, vertigo, and stuttering, the ERP updated the 28 protocols to reflect the latest science and technology. ERP recommendations include six new protocols, five updated protocols (from the same source), and one retired protocol. New additions include two voice-related, three hearing-related, and two speech-related protocols. Additions reflect new phone/tablet applications for hearing and language, and clinical evaluations of voice. "Language" was added to the domain name, which is now "Speech, Language, and Hearing," to represent language-related protocols. These protocols can facilitate the assessment of speech, language, and hearing in clinical and population research. Common data elements (i.e., use of the same variables across studies) used by geneticists, otolaryngologists, audiologists, speech-language pathologists, and in other disciplines can lead to cross-study data integration and increased statistical power when studies are combined. Copyright © 2021 Research Triangle Institute. Annals of Human Genetics published by University College London (UCL) and John Wiley & Sons Ltd.

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31. **EHealth and Its Role in Supporting Audiological Rehabilitation: Patient Perspectives on Barriers and Facilitators of Using a Personal Hearing Support System With Mobile Application as Part of the EVOTION Study**

Item Type: Journal Article

Authors: Murdin, Louisa;Sladen, Mark;Williams, Hannah;Bamiou, Doris-Eva;Bibas, Athanasios;Kikidis, Dimitris;Oiknonomou, Apostolis;Kouris, Ioannis;Koutsouris, Dimitris and Pontoppidan, Niels H.

Publication Date: 2022

Journal: Frontiers in Public Health 9, pp. 669727

Abstract: Background: Hearing loss is a major public health challenge. Audiology services need to utilise a range of rehabilitative services and maximise innovative practice afforded by technology to actively promote personalized, participatory, preventative and predictive care if they are to cope with the social and economic burden placed on the population by the rapidly rising prevalence of hearing loss. Digital interventions and teleaudiology could be a key part of providing high quality, cost-effective, patient-centred management. There is currently very limited evidence that assesses the hearing impaired patient perspective on the acceptance and usability of this type of technology.; Aim: This study aims to identify patient perceptions of the use of a hearing support system including a mobile smartphone app when used with Bluetooth-connected hearing aids across the everyday life of users, as part of the EVOTION project.; Methods: We applied a questionnaire to 564 participants in three countries across Europe and analysed the following topics: connectivity, hearing aid controls, instructional videos, audiological tests and auditory training.; Key Findings: Older users were just as satisfied as younger users when operating this type of technology. Technical problems such as Bluetooth connectivity need to be minimised as this issue is highly critical for user satisfaction, engagement and uptake. A

system that promotes user-controllability of hearing aids that is more accessible and easier to use is highly valued. Participants are happy to utilise monitoring tests and auditory training on a mobile phone out of the clinic but in order to have value the test battery needs to be relevant and tailored to each user, easy to understand and use. Such functions can elicit a negative as well as positive experience for each user.; Conclusion: Older and younger adults can utilise an eHealth mobile app to complement their rehabilitation and health care. If the technology works well, is tailored to the individual and in-depth personalised guidance and support is provided, it could assist maximisation of hearing aid uptake, promotion of self-management and improving outcomes. (Copyright © 2022 Murdin, Sladen, Williams, Bamiou, Bibas, Kikidis, Oiknonomou, Kouris, Koutsouris and Pontoppidan.)

DOI: https://libkey.io/10.3389/fpubh.2021.669727

32. **A Pilot Study to Develop the Rapid Estimate of Adult Literacy in Audiology**

Item Type: Journal Article

Authors: Ou, Hua

Publication Date: 2022

Journal: Health Literacy Research and Practice 6(2), pp. e88-e95

Abstract: Background: Health literacy describes an individuals' ability to maximize their potential in health care, including one's ability to understand information needed to make informed health decisions. A variety of general and condition-specific health literacy assessment tools have been created to help health professionals assess patients' health literacy skills and tailor the need for health care communication or education; however, there are no such tools available for the audiology field.; Objective: The purpose of the study was to develop an objective reading recognition audiology-related health literacy assessment tool, the Rapid Estimate of Adult Literacy in Audiology (REALA).; Methods: This was a cross-sectional study (N = 200). The initial version of the REALA contained 99 words specifically related to audiology. The final version, revised to have improved clinical utility, contained a total of 48 words that were selected based on item difficulty, item discrimination score, and point-biserial index using classical item analysis.; Key Results: The total pass rate for the final version of the 48-word REALA was 0.72 (standard deviation = 0.45) and the Cronbach coefficient alpha was 0.93. Once the comprehension component is added to the tool, the REALA can be a valuable health literacy assessment tool that health professionals use to evaluate patients' audiology-related health literacy.; Conclusion: Once the comprehension component is added to the tool, the REALA can be a valuable health literacy assessment tool that health professionals use to evaluate patients' audiology-related health literacy. HLRP: Health Literacy Research and Practice . 2022;6(2):e88-e95.] Plain Language Summary: A health literacy assessment tool, the REALA, was developed in the study. The final version of REALA contained 48 words relative to hearing healthcare. The results suggested that REALA can help health professionals assess patients' hearing related health literacy and tailor the need for hearing health care communication or education.

DOI: https://libkey.io/10.3928/24748307-20220418-0

33. **Speech Audiometrical Results Before and After Reimplantation of Cochlear Implants.**

Item Type: Journal Article

Authors: Oz, Okan;De Ceulaer, Geert and Govaerts, Paul J.

Publication Date: 2022

Journal: Ear & Hearing 43(2), pp. 669-675

Abstract: OBJECTIVES: This study aimed to compare the audiological outcomes of cochlear reimplantation with those of the first cochlear implant (CI). DESIGN: A retrospective analysis was performed on the data of all CI recipients who received the first CI at the age of 8 years or above and who were subsequently reimplanted on the same side. All participants who received their first implant after January 1, 2000, and who were reimplanted before January 1, 2021, were included. CI recipients who were unable to perform an open-set of Flemish monosyllable speech audiometry were excluded. The participants' clinical files were reviewed in terms of the cause of hearing loss, age at the first and second implantation, device types, the time between the first and second surgery, speech reception scores before and after reimplantation, and the reason for reimplantation. RESULTS: Reimplantation was due to device failure in 19 out of 22 patients, performance decrement in two patients, and medical reasons in one patient. The interval between the first and second CI ranged from 8 to 218 mo. Within-subject analysis showed the speech reception performance with the second CI to be significantly better than that with the first CI at all follow-up time points, with average within-patient gains of 17%, 16%, 12%, and 15% at 3 mo, 9 mo, 3 years, and the highest scores achieved, respectively. After reimplantation, the performance was better than the last results before reimplantation, and this was significant from 9 mo after reimplantation onwards. Three patients (14%) had a performance degradation with the second CI, which was probably owing to (1) difficulties in reimplantation surgery leading to a reduced number of active channels, (2) insufficient experience with the second CI as the reimplantation has been performed recently, and (3) advanced fenestral and retrofenestral otosclerosis. CONCLUSIONS: The present study shows that speech reception performance after reimplantation yields faster and better results than the first implant. It takes a couple of months to get better results than those before the reimplantation. Only in a minority of participants, a small deterioration may be observed. It seems that soft failures in the absence of measurable technical abnormalities call for caution with regard to reimplantation.

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34. **Prevalence of hearing screening failures in low-risk childhood cancer survivors**

Item Type: Journal Article

Authors: Phelan, Meghan;Hayashi, Susan S.;Sauerburger, Kara;Henry, Jennifer;Wu, Ningying and Hayashi, Robert J.

Publication Date: 2022

Journal: Pediatric Blood & Cancer 69(2), pp. e29437

Abstract: Background: We sought to estimate the frequency of hearing screening failures in pediatric cancer survivors at low risk for hearing loss and evaluate the feasibility of administering screenings in this population.; Procedure: Survivors in the St. Louis Children's Hospital Late Effects Clinic were recruited. Eligibility included (a) diagnosis of a pediatric cancer treated without platinum chemotherapy or cranial radiation, (b) at least 6 months from completion of therapy, (c) between the ages of 7 and 18 years, (d) cognitively/behaviorally able to participate, and (e) English speaking. Behavioral hearing screenings from 1000 to 8000 Hz were performed by trained personnel using a calibrated audiometer. A failed screen was defined by a participant not responding to

two or more of the three screening attempts for at least one frequency in at least one ear.; Results: One hundred nine patients met eligibility criteria with 78 enrolled (71.5%). Diagnoses included leukemia (57.7%), sarcoma (11.5%), Wilms tumor (14.1%), lymphoma (12.8%), and other solid tumors (3.9%). The median age was 13.2 years (Q1-Q3: 9.6-15.4) and the median time from treatment completion was 3.7 years (Q1-Q3: 2.3-7.4). Eighteen patients (23%) failed the hearing screen (95% CI: 14%-34%). No demographic or treatment-related variables were significantly correlated to screening failure. Six screen failures (33%) underwent formal audiology assessments, with three demonstrating unilateral hearing loss: two conductive and one sensorineural.; Conclusions: A significant fraction of pediatric cancer survivors at low risk for hearing loss failed hearing screening. Broader use of hearing screening should be considered. (© 2021 Wiley Periodicals LLC.)

DOI: https://libkey.io/10.1002/pbc.29437

35. **Is Auditory Steady-State Response Testing the Key for Diagnosing Non-Organic Hearing Disorders? Implications for Current Audiological Practice.**

Item Type: Journal Article

Authors: Plioutas, John;Vlastarakos, Petros V.;Delidis, Alexandros;Vasileiou, Alexandra;Nikolopoulos, Thomas P. and Maragoudakis, Pavlos

Publication Date: Apr ,2022

Journal: Journal of Audiology & Otology 26(2), pp. 61-67

Abstract: BACKGROUND AND OBJECTIVES: To describe all possible facets of non-organic hearing disorders (NOHD) and emphasize the superiority of auditory steady-state response (ASSR) over previously employed hearing assessment tools. SUBJECTS AND METHODS: A series of seven patients consisting of three males and four females with NOHD were assessed at Attikon University Hospital (age range: 17-59 years). Three patients had Munchausen syndrome, three intentionally feigned hearing loss, and one intentionally feigned normal hearing. The audiological evaluation consisted of tympanometry, pure-tone audiometry, and ASSR testing. RESULTS: The hearing of all patients was accurately determined using ASSR. The results were confirmed by auditory brainstem responses (ABR) and otoacoustic emissions. CONCLUSIONS: NOHD is a multi-faceted condition encompassing various etiologies. ASSR testing represents an objective and reliable method of hearing assessment, which can serve as a gold standard method for distinguishing NOHD from actual hearing loss. It can reliably indicate the hearing levels at the four main frequencies (500, 1,000, 2,000, and 4,000 Hz) by obtaining a valid estimated audiogram through statistical measures. Compared to ABR testing, ASSR thresholds are closer to the actual audiometric thresholds in the presence of hearing impairment and are superior when the corresponding pure-tone audiogram is widely ranging between the adjacent frequencies or when the obtained ABR curves are not easily distinguished. A non-confrontational approach should be adopted by ENT doctors towards cases of suspected NOHD as the use of ASSR could reliably assess hearing even when medical or medico-legal implications are involved.

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36. **Preliminary Evaluation of Automated Speech Recognition Apps for the Hearing Impaired and Deaf.**

Item Type: Journal Article

Authors: Pragt, Leontien;van Hengel, Peter;Grob, Dagmar and Wasmann, Jan-Willem A.

Publication Date: 2022

Journal: Frontiers in Digital Health 4, pp. 806076

Abstract: OBJECTIVE: Automated speech recognition (ASR) systems have become increasingly sophisticated, accurate, and deployable on many digital devices, including on a smartphone. This pilot study aims to examine the speech recognition performance of ASR apps using audiological speech tests. In addition, we compare ASR speech recognition performance to normal hearing and hearing impaired listeners and evaluate if standard clinical audiological tests are a meaningful and quick measure of the performance of ASR apps. METHODS: Four apps have been tested on a smartphone, respectively AVA, Earfy, Live Transcribe, and Speechy. The Dutch audiological speech tests performed were speech audiometry in quiet (Dutch CNC-test), Digits-in-Noise (DIN)-test with steady-state speech-shaped noise, sentences in quiet and in averaged long-term speech-shaped spectrum noise (Plomp-test). For comparison, the app's ability to transcribe a spoken dialogue (Dutch and English) was tested. RESULTS: All apps scored at least 50% phonemes correct on the Dutch CNC-test for a conversational speech intensity level (65 dB SPL) and achieved 90-100% phoneme recognition at higher intensity levels. On the DIN-test, AVA and Live Transcribe had the lowest (best) signal-to-noise ratio +8 dB. The lowest signal-to-noise measured with the Plomp-test was +8 to 9 dB for Earfy (Android) and Live Transcribe (Android). Overall, the word error rate for the dialogue in English (19-34%) was lower (better) than for the Dutch dialogue (25-66%). CONCLUSION: The performance of the apps was limited on audiological tests that provide little linguistic context or use low signal to noise levels. For Dutch audiological speech tests in quiet, ASR apps performed similarly to a person with a moderate hearing loss. In noise, the ASR apps performed more poorly than most profoundly deaf people using a hearing aid or cochlear implant. Adding new performance metrics including the semantic difference as a function of SNR and reverberation time could help to monitor and further improve ASR performance. Copyright © 2022 Pragt, van Hengel, Grob and Wasmann.

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37. **Early detection of hearing loss for infants in Western Australia: Comparison to international benchmarks.**

Item Type: Journal Article

Authors: Reid, Allison;Firns, Sarah;Tao, Karina;Maywood, Erin;Herbert, Hayley;Mulders, Wilhemina A. M.;Kuthubutheen, Jafri and Brennan-Jones, Christopher

Publication Date: Mar ,2022

Journal: Journal of Paediatrics & Child Health 58(3), pp. 422-426

Abstract: AIM: To assess the degree to which timely audiological assessment of congenital hearing loss is achieved at our institution - Perth Children's Hospital, Western Australia, and to review cases which breached

this timeframe in order to address barriers to timely assessment. The benchmark used to determine timely assessment is that set out by The Joint Committee on Infant Hearing (JCIH) in which diagnostic audiological testing occurs by three months of age for those who do not pass newborn hearing screening. METHODS: A retrospective chart review of infants who underwent diagnostic auditory assessment at Perth Children's Hospital between 2016-2019. A total of 151 children were identified as meeting the inclusion criteria and their medical files were reviewed. Time to first dABR was the time point for whether testing was achieved within the 3 month timeframe. RESULTS: Of the 151 children who underwent dABR assessments, 1 was identified as having breached the 90 day time limit (tested on day 91) for which no valid reason for delay could be identified. The timely delivery of dABR assessments in 99.3% of cases within this cohort compares favourably with the literature. CONCLUSIONS: Conclusion Timely diagnostic audiological assessment is achievable for children with congenital hearing loss. The reasons for patients breaching this timeframe are explored in the paper along with factors which may help avoid delays. Copyright © 2021 Paediatrics and Child Health Division (The Royal Australasian College of Physicians).

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38. **Clinical Practice Guideline: Tympanostomy Tubes in Children (Update).**

Item Type: Journal Article

Authors: Rosenfeld, Richard M.;Tunkel, David E.;Schwartz, Seth R.;Anne, Samantha;Bishop, Charles E.;Chelius, Daniel C.;Hackell, Jesse;Hunter, Lisa L.;Keppel, Kristina L.;Kim, Ana H.;Kim, Tae W.;Levine, Jack M.;Maksimoski, Matthew T.;Moore, Denee J.;Preciado, Diego A.;Raol, Nikhila P.;Vaughan, William K.;Walker, Elizabeth A. and Monjur, Taskin M.

Publication Date: 2022

Journal: Otolaryngology - Head & Neck Surgery 166(1_suppl), pp. S1-S55

Abstract: OBJECTIVE: Insertion of tympanostomy tubes is the most common ambulatory surgery performed on children in the United States. Tympanostomy tubes are most often inserted because of persistent middle ear fluid, frequent ear infections, or ear infections that persist after antibiotic therapy. All these conditions are encompassed by the term otitis media (middle ear inflammation). This guideline update provides evidence-based recommendations for patient selection and surgical indications for managing tympanostomy tubes in children. The guideline is intended for any clinician involved in managing children aged 6 months to 12 years with tympanostomy tubes or children being considered for tympanostomy tubes in any care setting as an intervention for otitis media of any type. The target audience includes specialists, primary care clinicians, and allied health professionals. PURPOSE: The purpose of this clinical practice guideline update is to reassess and update recommendations in the prior guideline from 2013 and to provide clinicians with trustworthy, evidence-based recommendations on patient selection and surgical indications for managing tympanostomy tubes in children. In planning the content of the updated guideline, the guideline update group (GUG) affirmed and included all the original key action statements (KASs), based on external review and GUG assessment of the original recommendations. The guideline update was supplemented with new research evidence and expanded profiles that addressed quality improvement and implementation issues. The group also discussed and prioritized the need for new recommendations based on gaps in the initial guideline or new evidence that

would warrant and support KASs. The GUG further sought to bring greater coherence to the guideline recommendations by displaying relationships in a new flowchart to facilitate clinical decision making. Last, knowledge gaps were identified to guide future research. METHODS: In developing this update, the methods outlined in the American Academy of Otolaryngology-Head and Neck Surgery Foundation's "Clinical Practice Guideline Development Manual, Third Edition: A Quality-Driven Approach for Translating Evidence Into Action" were followed explicitly. The GUG was convened with representation from the disciplines of otolaryngology-head and neck surgery, otology, pediatrics, audiology, anesthesiology, family medicine, advanced practice nursing, speech-language pathology, and consumer advocacy. ACTION STATEMENTS: The GUG made strong recommendations for the following KASs: (14) clinicians should prescribe topical antibiotic ear drops only, without oral antibiotics, for children with uncomplicated acute tympanostomy tube otorrhea; (16) the surgeon or designee should examine the ears of a child within 3 months of tympanostomy tube insertion AND should educate families regarding the need for routine, periodic follow-up to examine the ears until the tubes extrude. The GUG made recommendations for the following KASs: (1) clinicians should not perform tympanostomy tube insertion in children with a single episode of otitis media with effusion (OME) of less than 3 months' duration, from the date of onset (if known) or from the date of diagnosis (if onset is unknown); (2) clinicians should obtain a hearing evaluation if OME persists for 3 months or longer OR prior to surgery when a child becomes a candidate for tympanostomy tube insertion; (3) clinicians should offer bilateral tympanostomy tube insertion to children with bilateral OME for 3 months or longer AND documented hearing difficulties; (5) clinicians should reevaluate, at 3- to 6-month intervals, children with chronic OME who do not receive tympanostomy tubes, until the effusion is no longer present, significant hearing loss is detected, or structural abnormalities of the tympanic membrane or middle ear are suspected; (6) clinicians should not perform tympanostomy tube insertion in children with recurrent acute otitis media who do not have middle ear effusion in either ear at the time of assessment for tube candidacy; (7) clinicians should offer bilateral tympanostomy tube insertion in children with recurrent acute otitis media who have unilateral or bilateral middle ear effusion at the time of assessment for tube candidacy; (8) clinicians should determine if a child with recurrent acute otitis media or with OME of any duration is at increased risk for speech, language, or learning problems from otitis media because of baseline sensory, physical, cognitive, or behavioral factors; (10) the clinician should not place long-term tubes as initial surgery for children who meet criteria for tube insertion unless there is a specific reason based on an anticipated need for prolonged middle ear ventilation beyond that of a short-term tube; (12) in the perioperative period, clinicians should educate caregivers of children with tympanostomy tubes regarding the expected duration of tube function, recommended follow-up schedule, and detection of complications; (13) clinicians should not routinely prescribe postoperative antibiotic ear drops after tympanostomy tube placement; (15) clinicians should not encourage routine, prophylactic water precautions (use of earplugs or headbands, avoidance of swimming or water sports) for children with tympanostomy tubes. The GUG offered the following KASs as options: (4) clinicians may perform tympanostomy tube insertion in children with unilateral or bilateral OME for 3 months or longer (chronic OME) AND symptoms that are likely attributable, all or in part, to OME that include, but are not limited to, balance (vestibular) problems, poor school performance, behavioral problems, ear discomfort, or reduced quality of life; (9) clinicians may perform tympanostomy tube insertion in at-risk children with unilateral or bilateral OME that is likely to persist as reflected by a type B (flat) tympanogram or a documented effusion for 3 months or longer; (11) clinicians may perform adenoidectomy as an adjunct to tympanostomy tube insertion for children with symptoms directly related to the adenoids (adenoid infection or nasal obstruction) OR in children aged 4 years or older to potentially reduce future incidence of recurrent otitis media or the need for repeat tube insertion.

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39. **Cartilaginous bending spring tympanoplasty: a temporal bone study and first clinical results.**

Item Type: Journal Article

Authors: Rupp, Robin;Schelhorn, Tony;Kniesburges, Stefan;Balk, Matthias;Allner, Moritz;Mantsopoulos, Konstantinos;Iro, Heinrich;Hornung, Joachim and Gostian, Antoniu-Oreste

Publication Date: 2022

Journal: European Archives of Oto-Rhino-Laryngology
Abstract: OBJECTIVE: Anchoring grafts for tympanic membrane (TM) reconstruction in anterior and subtotal TM defects is essential to prevent medialisation and can be facilitated by cartilaginous bending spring tympanoplasty (CBST). The purpose of this study was to analyse the impact of spring cartilages on middle ear transfer functions and patient hearing levels. METHODS: In six fresh-frozen human temporal bones a cartilage graft (measuring 6 x 2 mm with a thickness of 0.1-0.2 mm) was formed into a 'U'-shaped bending spring, to be placed between the medial tympanic wall and the tympanic underlay grafts. The stapes velocity for excitation by exponential sweeps from 400 to 10,000 Hz was measured with a laser Doppler vibrometer. The resulting middle ear transfer functions were compared with the reconstructed middle ear. For clinical evaluation, 23 ears in 21 patients with chronic otitis media and an intact ossicular chain were operated using CBST. At each follow-up visit, the patients underwent pure-tone audiometry and the Freiburg monosyllabic speech test at a presentation level of 65 dB SPL for the word recognition score (WRS). RESULTS: The measured stapes velocities at one-third octave midband frequencies averaged 3.56 x 10-2 +/- 9.46 x 10-3 (mm/s/Pa) compared to 3.06 x 10-2 +/- 6.86 x 10-3 (mm/s/Pa) with the bending and underlay cartilage in place (p = 0.319; r = 0.32). The bending spring tympanoplasty reduced the transfer function by 1.41 +/- 0.98 dB on average. In the clinical part of the study, the graft success rate was 96% (22 out of 23 patients) after a mean follow-up of 5.8 +/- 2.4 months (min. 3.5 months, max. 12.0 months). The air-bone gap improved significantly by 6.2 dB (+/- 6.6 dB; p (mm/s/Pa) with the bending and underlay cartilage in place (p = 0.319; r = 0.32). The bending spring tympanoplasty reduced the transfer function by 1.41 +/- 0.98 dB on average. In the clinical part of the study, the graft success rate was 96% (22 out of 23 patients) after a mean follow-up of 5.8 +/- 2.4 months (min. 3.5 months, max. 12.0 months). The air-bone gap improved significantly by 6.2 dB (+/- 6.6 dB; p

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40. **Impact of Auditory-Oral Education on Device Use in Children With Hearing Loss.**

Item Type: Journal Article

Authors: Sanchez, Chrisanda;Coto, Jennifer;Berrios, Daniela and Cejas, Ivette

Publication Date: 2022

Journal: Language, Speech & Hearing Services in the Schools 53(1), pp. 222-230

Abstract: PURPOSE: This study examined changes in datalogging for children attending an auditory-oral educational program with integrated audiology services versus children attending a mainstream or nonspecialized program. METHOD: Eighty children participated in this study, half of which were enrolled in an auditory-oral educational program versus the nonspecialized or mainstream setting. Datalogging for cochlear implant and hearing aid users was obtained via retrospective medical and educational chart review from 2016 to 2019. RESULTS: Results demonstrated that at post-enrollment, children attending the auditory-oral educational program significantly increased device wear time (as measured by average hours/day) when compared to the control group. Children using hearing aids enrolled in the specialized educational program obtained the largest improvement in overall wear time, averaging an increase of 5 hr/day of device use from pre- to post-enrollment. CONCLUSIONS: This is the first study to document the association of specialized educational programs on device use. Clinical and educational programs should collaborate to provide integrated services to lessen family burden and increase a child's device use and retention.

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41. **Congenital Sensorineural Hearing Loss**

Item Type: Journal Article

Authors: Shave, Samantha;Botti, Christina and Kwong, Kelvin

Publication Date: 2022

Journal: Pediatric Clinics of North America 69(2), pp. 221-234

Abstract: Congenital sensorineural hearing loss is highly prevalent in our population, with a wide variety of causes. The key to clinical management is early detection and intervention, to promote language and cognitive development. With expanding genetic knowledge about congenital sensorineural hearing loss, the indiscriminate approach in workup is no longer recommended. Comprehensive genetic evaluation and cytomegalovirus testing are key to identify the underlying cause of the hearing loss. Treatment and prognosis depend on age of hearing loss onset and detection; management plans will typically include audiology consultation, speech therapy, and various hearing amplification devices and technologies when applicable.

URL: https://libkey.io/libraries/1293/openurl?genre=article&sid=OVID:medline&id=pmid:35337535&id=doi:10.1016%2Fj.pcl.2021.12.006&issn=0031-3955&isbn=&volume=69&issue=2&spage=221&pages=221-234&date=2022&title=Pediatric+Clinics+of+North+America&atitle=Congenital+Sensorineural+Hearing+Loss.&aulast=Shave&pid=%3Cauthor%3EShave+S%3BBotti+C%3BKwong+K%3C%2Fauthor%3E%3CAN%3E35337535%3C%2FAN%3E%3CDT%3EJournal+Article%3C%2FDT%3E

42. **Psychiatric and audiologic features of misophonia: Use of a clinical control group with auditory over-responsivity.**

Item Type: Journal Article

Authors: Siepsiak, M.;Rosenthal, M. Z.;Raj-Koziak, D. and Dragan, W.

Publication Date: May ,2022

Journal: Journal of Psychosomatic Research 156, pp. 110777

Abstract: OBJECTIVE: This cross-sectional study was designed to add to the emerging empirical literature characterizing the psychiatric and audiologic features of misophonia. Because most research to date has not compared misophonia to clinical control groups, the present study used both participants who did not report any sound intolerance problems and a clinical control group of participants with auditory over-responsivity not formally meeting criteria for a diagnosis of misophonia using proposed diagnostic criteria by Schroeder et al. (2013). Severity of misophonia symptoms, frequency of current or lifetime psychiatric disorders, loudness discomfort, and hearing loss were compared across groups. METHODS: Structured interviews, questionnaires, and objective measures of audiologic functioning were administered to a sample of adult participants (N = 156). Measures included an interviewer-rated diagnostic assessment of misophonia, the MisoQuest, (Siepsiak et al., 2020), M.I.N.I (Sheehan et al., 1998), loudness discomfort level (LDL), and hearing loss (PTA). RESULTS: Group differences in misophonia symptom severity among all three groups were observed: FWelch (2,50.57) = 149.92, p 2 (2, N = 142) = 14.3; p = .001; V = 0.317. A wide range of psychiatric disorders were observed in the misophonia group, (e.g., major depressive episode, suicidality and panic disorder were the most common). There were no significant differences between groups with regards to audiologic functioning. CONCLUSION: Misophonia co-occurs with a variety of psychiatric disorders but does not appear to be associated with loudness discomfort or hearing impairments. Copyright © 2022. Published by Elsevier Inc.

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43. **Extended scope of practice audiology in the ENT outpatient clinic - a pilot study.**

Item Type: Journal Article

Authors: Tavora-Vieira, Dayse;Voola, Marcus;Majteles, Lisa;Timms, Lydia;Acharya, Aanand and Kuthubutheen, Jafri

Publication Date: Jan ,2022

Journal: International Journal of Audiology 61(1), pp. 29-33

Abstract: OBJECTIVE: To investigate the feasibility of using an extended scope (ES) audiology service to provide care to non-urgent adult patients waiting for an Ear Nose and Throat (ENT) appointment. DESIGN: Based on suitability criteria developed by the Audiology and ENT departments, an internal review of the ENT wait list identified patients who would be suitable for an ES audiology clinic. STUDY SAMPLE: 220 non-urgent patients on the ENT wait list with hearing loss and/or tinnitus. RESULTS: A total of 220 patients were transferred from the ENT wait list to the ES audiology clinic: 200 (90.9%) were seen by the ES Audiologist and 20 (9.1%) patients self-discharged or did not attend the appointment. Out of the 200 patients seen, 175 (87.5%) were assessed, managed and discharged without the need for input from an Otologist. The remaining 25 (12.5%) patients

needed an Otologist's input. CONCLUSION: This study has demonstrated the feasibility of an ES audiology clinic in a tertiary teaching hospital. Of those seen by ES audiologist, 87.5% were discharged from the ENT wait list without medical intervention. This model may represent an effective alternative pathway for lengthy outpatient waiting list management whilst providing patients with timely access to care.

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44. **Internet-Based Audiologist-Guided Cognitive Behavioral Therapy for Tinnitus: Randomized Controlled Trial**

Item Type: Journal Article

Authors: W Beukes, Eldré;Andersson, Gerhard;Fagelson, Marc and Manchaiah, Vinaya

Publication Date: 2022

Journal: Journal of Medical Internet Research 24(2), pp. e27584

Abstract: Background: Tinnitus is a symptom that can be very distressing owing to hearing sounds not related to any external sound source. Managing tinnitus is notoriously difficult, and access to evidence-based care is limited. Cognitive behavioral therapy (CBT) is a tinnitus management strategy with the most evidence of effectiveness but is rarely offered to those distressed by tinnitus. The provision of internet-based CBT for tinnitus overcomes accessibility barriers; however, it is not currently readily available in the United States.; Objective: The aim of this study is to investigate the efficacy of internet-based CBT compared with that of weekly monitoring for the management of tinnitus in reducing tinnitus distress; reducing tinnitus-related comorbidities, including tinnitus cognitions, insomnia, anxiety, and depression; and assessing the stability of the intervention effects 2 months after the intervention.; Methods: A 2-arm randomized clinical trial comparing audiologist-guided internet-based CBT (n=79) to a weekly monitoring group (n=79) with a 2-month follow-up assessed the efficacy of internet-based CBT. Eligible participants included adults seeking help for tinnitus. Recruitment was conducted on the web using an open-access website. Participants were randomized via 1:1 allocation, but blinding was not possible. The study was undertaken by English or Spanish speakers on the web. The primary outcome was a change in tinnitus distress as measured using the Tinnitus Functional Index. Secondary outcome measures included anxiety, depression, insomnia, tinnitus cognition, hearing-related difficulties, and quality of life.; Results: Internet-based CBT led to a greater reduction in tinnitus distress (mean 36.57, SD 22) compared with that in weekly monitoring (mean 46.31, SD 20.63; effect size: Cohen d=0.46, 95% CI 0.14-0.77) using an intention-to-treat analysis. For the secondary outcomes, there was a greater reduction in negative tinnitus cognition and insomnia. The results remained stable over the 2-month follow-up period. No important adverse events were observed. Further, 16% (10/158) of participants withdrew, with low overall compliance rates for questionnaire completion of 72.3% (107/148) at T1, 61% (91/148) at T2, and 42% (62/148) at T3.; Conclusions: This study is the first to evaluate and indicate the efficacy of audiologist-delivered internet-based CBT in reducing tinnitus distress in a US population. It was also the first study to offer internet-based CBT in Spanish to accommodate the large Hispanic population in the United States. The results have been encouraging, and further work is indicated in view of making such an intervention applicable to a wider population. Further work is required to improve compliance and attract more Spanish speakers.; Trial Registration: ClinicalTrials.gov NCT04004260; https://clinicaltrials.gov/ct2/show/NCT04004260. (©Eldré W Beukes, Gerhard Andersson, Marc Fagelson, Vinaya Manchaiah. Originally published in the Journal of Medical Internet Research (https://www.jmir.org), 14.02.2022.)

DOI: https://libkey.io/10.2196/27584

45. **Multiple Cases of Auditory Neuropathy Illuminate the Importance of Subcortical Neural Synchrony for Speech-in-noise Recognition and the Frequency-following Response.**

Item Type: Journal Article

Authors: White-Schwoch, Travis;Anderson, Samira;Krizman, Jennifer;Bonacina, Silvia;Nicol, Trent;Bradlow, Ann R. and Kraus, Nina

Publication Date: 2022

Journal: Ear & Hearing 43(2), pp. 605-619

Abstract: OBJECTIVES: The role of subcortical synchrony in speech-in-noise (SIN) recognition and the frequency-following response (FFR) was examined in multiple listeners with auditory neuropathy. Although an absent FFR has been documented in one listener with idiopathic neuropathy who has severe difficulty recognizing SIN, several etiologies cause the neuropathy phenotype. Consequently, it is necessary to replicate absent FFRs and concomitant SIN difficulties in patients with multiple sources and clinical presentations of neuropathy to elucidate fully the importance of subcortical neural synchrony for the FFR and SIN recognition. DESIGN: Case series. Three children with auditory neuropathy (two males with neuropathy attributed to hyperbilirubinemia, one female with a rare missense mutation in the OPA1 gene) were compared to age-matched controls with normal hearing (52 for electrophysiology and 48 for speech recognition testing). Tests included standard audiological evaluations, FFRs, and sentence recognition in noise. The three children with neuropathy had a range of clinical presentations, including moderate sensorineural hearing loss, use of a cochlear implant, and a rapid progressive hearing loss. RESULTS: Children with neuropathy generally had good speech recognition in quiet but substantial difficulties in noise. These SIN difficulties were somewhat mitigated by a clear speaking style and presenting words in a high semantic context. In the children with neuropathy, FFRs were absent from all tested stimuli. In contrast, age-matched controls had reliable FFRs. CONCLUSION: Subcortical synchrony is subject to multiple forms of disruption but results in a consistent phenotype of an absent FFR and substantial difficulties recognizing SIN. These results support the hypothesis that subcortical synchrony is necessary for the FFR. Thus, in healthy listeners, the FFR may reflect subcortical neural processes important for SIN recognition.

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46. **A New Active Osseointegrated Implant System in Patients with Single-Sided Deafness.**

Item Type: Journal Article

Authors: Willenborg, Kerstin;Avallone, Emilio;Maier, Hannes;Lenarz, Thomas and Busch, Susan

Publication Date: 2022

Journal: Audiology & Neuro-Otology 27(1), pp. 83-92

Abstract: OBJECTIVE: The Cochlear TM Osia R System (Osia) is an active transcutaneous bone conduction implant system intended for patients with conductive and mixed hearing loss but can also be used in cases of single-sided deafness (SSD) for the contralateral routing of signal (CROS). The Osia implant is placed subcutaneously under the intact skin behind the ear with the piezoelectric actuator connected to an osseointegrated BI300 implant - a titanium screw used for a 2-stage Baha surgery - on the mastoid. The external processor is magnetically attached to the subcutaneous implant receiver coil. As the Osia has recently been CE certified and is new on the market, with limited patient outcome data for SSD available, the objective of this study was the evaluation of surgical procedure, audiological results, and patient satisfaction for the Osia in SSD patients. STUDY DESIGN: In a prospective, monocentric clinical observation study, 6 patients (18 years of age or older) with SSD and bone conduction thresholds pure tone average 0.5, 1, 2, and 4 kHz

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47. **Adapting and validating the Autism Diagnostic Interview - Revised for use with deaf children and young people**

Item Type: Journal Article

Authors: Wright, Barry;Phillips, Helen;Allgar, Victoria;Sweetman, Jennifer;Hodkinson, Rachel;Hayward, Emily;Ralph-Lewis, Amelia;Teige, Catarina;Bland, Martin and Le Couteur, Ann

Publication Date: 2022

Journal: Autism: The International Journal of Research & Practice 26(2), pp. 446-459

Abstract: A Delphi consensus methodology was used to adapt the Autism Diagnostic Interview–Revised for the assessment of deaf children with suspected autism spectrum disorder. Each Autism Diagnostic Interview–Revised item was considered by a panel of nine international experts in terms of relevance and acceptability. Modifications were proposed and agreed by the expert panel for 45% of items. The pre-specified criterion for agreement between experts was set at 80% for each item. A first validation of the revised version, adapted for deaf children (Autism Diagnostic Interview–Revised Deaf Adaptation), was undertaken with a UK sample of 78 parents/carers of deaf children with autism spectrum disorder and 126 parents/carers with deaf children without autism spectrum disorder. When compared to National Institute for Health and Care Excellence guideline standard clinical assessments, the Autism Diagnostic Interview–Revised Deaf Adaptation diagnostic algorithm cut-off/threshold scores achieved a sensitivity of 89% (79%–96%) and specificity of 81% (70%–89%) for autism spectrum disorder. The alpha coefficients for each algorithm symptom domain ranged from 0.80 to 0.91, suggesting that the items had high internal consistency. Our findings indicate that the Autism Diagnostic Interview–Revised Deaf Adaptation is likely to be a useful measure for the assessment of deaf children with suspected autism spectrum disorder, although further research is needed. Autism assessment processes need to improve for deaf children as they are currently being diagnosed later than their hearing counterparts and misdiagnosis can occur. We took one of the most commonly used parent developmental interviews for autism

spectrum disorder the Autism Diagnostic Interview–Revised and adapted it using international expert advice. Modifications were proposed and agreed by the expert panel for 45% of items; the remaining 55% of items were unchanged. We then tested the revised version, adapted for deaf children (Autism Diagnostic Interview–Revised Deaf Adaptation), in a UK sample of 78 parents/carers of deaf children with autism spectrum disorder and 126 parents/carers with deaf children without autism spectrum disorder. When compared to National Institute for Health and Care Excellence guideline standard clinical assessments, the Autism Diagnostic Interview–Revised Deaf Adaptation diagnostic algorithm threshold scores could identify those deaf children with a definite diagnosis (true autism spectrum disorder positives) well (sensitivity of 89% (79%–96%)) and those deaf children who did not have autism spectrum disorder (true autism spectrum disorder negatives) well (specificity of 81% (70%–89%)). Our findings indicate that the Autism Diagnostic Interview–Revised Deaf Adaptation is likely to prove a useful measure for the assessment of deaf children with suspected autism spectrum disorder and that further research would be helpful.

DOI: https://libkey.io/10.1177/13623613211029116

48. **Hearing From You: Design Thinking in Audiological Research.**

Item Type: Journal Article

Authors: Young, Taegan;Pang, Jermy and Ferguson, Melanie

Publication Date: Mar 28 ,2022

Journal: American Journal of Audiology 1-10
Abstract: PURPOSE: The purpose of this article is to describe the emerging use of design thinking methodologies in hearing health care research using a participatory action approach with a consumer and community involvement panel, audiologists, and adults with hearing loss. METHOD: Two connected hearing health care projects that adopted design thinking principles are presented here as case studies. Case 1 investigated the applicability and acceptability of smart voice assistant technology as post-hearing aid fitting support. Case 2 investigated the feasibility of providing support for new adult patients with hearing loss before they attend their hearing assessment appointment. DISCUSSION: The design thinking process provided a flexible structure in which researchers were able to empathize with stakeholders, define their unmet needs, and ideate potential connected hearing health care solutions to develop and evaluate prototypes in clinical and home settings. CONCLUSION: Utilizing a needs-based, collaborative design thinking approach to conduct development in hearing health care research is a viable and novel option to produce innovative, relevant, and translational hearing health solutions that address stakeholder needs.

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49. **Making Race Visible in the Speech, Language, and Hearing Sciences: A Critical Discourse Analysis**

Item Type: Journal Article

Authors: Yu, Betty;Horton, RaMonda;Munson, Benjamin;Newkirk-Turner, Brandi;Johnson, Valerie E.;Khamis-Dakwar, Reem;Muñoz, Maria,L. and Hyter, Yvette D.

Publication Date: 2022

Journal: American Journal of Speech-Language Pathology 31(2), pp. 578-600

Abstract: Purpose: The purpose of this critical discourse analytic study is to identify how two key professional standards documents in the Speech, Language and Hearing Sciences field-the Standards for Certification document and the Essential Functions rubric-contribute to the discursive construction of the ideal speech-language pathologist and audiologist, and to examine whether the experiences and needs of people of color are taken into consideration in these documents.; Method: Critical discourse analysis was used as both a conceptual and methodological lens for the systematic analysis of the targeted text.; Results: The findings show that considerations of race and racism were almost entirely absent from both documents and thus reflected a discourse of race neutrality that is ideologically consistent with color-blind racism. The enactment of racially coded expectations within a construct of race-neutral discourse maintains racial inequities in the speech, language, and hearing sciences professions.; Conclusions: The findings highlight the need for the open acknowledgment of racism in our institutional policies and discourses and official and ongoing commitments to concrete and measurable antiracist actions to counteract systemic racism. Recommendations for and examples of antiracist measures are offered.

DOI: https://libkey.io/10.1044/2021_AJSLP-20-00384

50. **Dysfunction of the Auditory System in Children With Hypothyroidism: A Systematic Review and Meta-Analysis.**

Item Type: Journal Article

Authors: Zhang, Kathy;Fried, Jacob;Nguyen, Shaun A.;Meyer, Ted A. and White, David R.

Publication Date: 2022

Journal: Ear & Hearing 43(1), pp. 23-31

Abstract: OBJECTIVE: To examine the prevalence of hearing impairment in children with hypothyroidism, and to characterize clinical and subclinical hearing loss by examining cochlear function, auditory brainstem pathways, and integration of the auditory system as a whole. DESIGN: An electronic search was conducted using PubMed, Scopus, and Cochrane Library databases. This systematic review was performed in accordance with the PRISMA guidelines. Original observational studies that utilized audiological tests for auditory system evaluations in hypothyroidism were included. A total of 2004 studies were found in the search, with 23 studies meeting the inclusion criteria. RESULTS: The pooled prevalence of hearing loss was 16.1% [95% confidence interval 10.7, 22.4] for children with congenital hypothyroidism. Hearing thresholds at pure-tone averages (0.5-2 kHz) were 1.6 dB [95% confidence interval 1.7, 4.8] higher for children with hypothyroidism compared to age-matched controls. Cochlear dysfunction was detected at middle frequencies (1-3 kHz) by otoacoustic emission testing, indicating abnormalities of hair cell function or cochlear integration. Retrocochlear involvement was detected on auditory brainstem response (ABR), with prolonged Wave I indicating a peripheral conduction abnormality localized to the middle or inner ear and eighth cranial nerve. CONCLUSIONS: Children with hypothyroidism have a higher prevalence of hearing loss than children without hypothyroidism. For children with congenital hypothyroidism, evidence of subclinical abnormalities at the level of the cochlea and eighth cranial nerve are present despite early initiation of levothyroxine therapy. Dysfunction of the auditory system might begin with predominance of peripheral conduction abnormalities early in development.

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51. **Social representation of hearing aids among people with hearing loss: an exploratory study**

Item Type: Journal Article

Authors: Chundu, Srikanth;Allen, Peter M.;Han, Woojae;Ratinaud, Pierre;Krishna, Rajalakshmi and Manchaiah, Vinaya

Publication Date: 2021

Journal: International Journal of Audiology 60(12), pp. 964-978

Abstract: The aim of the current study was to examine the social representation (SR) of hearing aids in people with hearing loss (PHL) in India, the Republic of Korea (ROK), the United Kingdom (UK), and the United States of America (US). The study used a cross-sectional survey design. The data collected by using a free association task were analysed qualitatively (i.e. content analysis) and quantitatively (i.e. chi-square analysis, similarities analysis, prototypical analysis). 424 participants with hearing loss The most commonly reported categories across all countries were "beneficial," "cost and time," and "appearance and design." Approximately 50% of the associations reported were negative. There were variations in terms of the categories that were predominant in the SR of each country. "Others actions and attitude" category was predominantly reported by PHL in India. "Disturbance" and "dissatisfaction" of hearing aids and the "repairs and maintenance of hearing aids" categories were mainly reported from the ROK and the US, respectively. The current results highlight the main aspects that PHL report spontaneously when they think about hearing aids. The findings will help to further inform public health campaigns and will contribute to develop culturally appropriate media materials regarding hearing aids.

DOI: https://libkey.io/10.1080/14992027.2021.1886349

52. **Uptake of internet-delivered UK adult hearing assessment**

Item Type: Journal Article

Authors: Dawes, Piers;Munro, Kevin J.;Frank, Timothy L.;Moore, David R.;Armitage, Chris;Marsden, Antonia;Lees, Jane and Dillon, Harvey

Publication Date: 2021

Journal: International Journal of Audiology 60(11), pp. 885-889

Abstract: To evaluate uptake of the internet-based hearing test, with respect to the 11% of UK adults that have hearing loss but do not use hearing aids. Feasibility study in a primary care practice in the North of England. Adults aged 50–74 years were sent postal invitations to complete an internet hearing test (N = 600). Those who

completed the test, those who failed (>35 dB HL in the better ear) and demographic correlates (age, gender, ethnicity and socioeconomic level) were recorded. 11.2% of invited adults completed the hearing test and 7.7% failed it. Those who took the test tended to have a higher socioeconomic background than those who did not. There were no differences in age, ethnicity or gender between those who took the test and those who did not. An estimated 70% (7.7%/11.0%) of adults with hearing loss but who do not use hearing aids took the test. Uptake was equitable across most demographic categories. Uptake was high among a study sample that was substantially more deprived than the general UK population. Internet-based hearing testing offers an efficient paradigm for identifying hearing loss.

DOI: https://libkey.io/10.1080/14992027.2021.1886353

53. **A combined genome-wide association and molecular study of age-related hearing loss in H. sapiens**

Item Type: Journal Article

Authors: Liu, Wei;Johansson, Åsa;Rask-Andersen, Helge and Rask-Andersen, Mathias

Publication Date: 2021

Journal: BMC Medicine 19(1), pp. 302

Abstract: Background: Sensorineural hearing loss is one of the most common sensory deficiencies. However, the molecular contribution to age-related hearing loss is not fully elucidated.Methods: We performed genome-wide association studies (GWAS) for hearing loss-related traits in the UK Biobank (N = 362,396) and selected a high confidence set of ten hearing-associated gene products for staining in human cochlear samples: EYA4, LMX1A, PTK2/FAK, UBE3B, MMP2, SYNJ2, GRM5, TRIOBP, LMO-7, and NOX4.Results: All proteins were found to be expressed in human cochlear structures. Our findings illustrate cochlear structures that mediate mechano-electric transduction of auditory stimuli, neuronal conductance, and neuronal plasticity to be involved in age-related hearing loss.Conclusions: Our results suggest common genetic variation to influence structural resilience to damage as well as cochlear recovery after trauma, which protect against accumulated damage to cochlear structures and the development of hearing loss over time.

DOI: https://libkey.io/10.1186/s12916-021-02169-0