



PRIMARY EAR AND HEARING CARE TRAINING MANUAL

WEB ANNEX. DEVELOPMENT OF THE PRIMARY EAR AND HEARING CARE TRAINING MANUAL, INFORMATION SOURCES AND DECLARATION OF INTERESTS



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The manual was developed through an evidence-based consultative process. The clinical processes, diagnostic steps and management/referral criteria described in the manual are based on high-quality information sources. The **hierarchy of evidence** that informs this manual is as follows:

- WHO guidelines and evidence-based technical products
- Published, high-quality clinical guidelines (quality assessed through application of AGREE-II tool for rating) including systematic reviews of clinical guidelines.
- Systematic reviews including those published by Cochrane ENT that relate to ear and hearing examination and clinical interventions.
- Textbooks on ENT and audiology, that are based on evidence synthesis and document the evidence sources.
- Peer-reviewed publications: these were used to inform the introduction and some narrative components of the manual.
- Discussions with experts guided the:
 - Selection of conditions to be included within the manual;
 - Inclusion of guidelines and their application within the manual;
 - Validation of clinical approaches including red flags for common ear diseases;
 - Choice of methodology of ear examination and hearing assessment, in cases where conflicting methodologies were identified in the textbooks and clinical guidelines.
- Stakeholder consultations: a stakeholder group that included academia, NGOs, clinical service providers, professional associations, and representatives of deaf and hard of hearing persons were involved in:
 - Validation of conditions selected;
 - Agreement on language and overall direction of the manual.
- Delphi surveys: two surveys were conducted to inform the:
 - Selection of conditions to be included;
 - Approaches to hearing screening in adults.

The outcomes were used by the expert group to make the final selection.

Process:

WHO guidelines and sources were first sought and used to inform all aspects of this training manual. For clinical processes where WHO guidelines are not available, clinical guidelines were identified through scoping the literature. These were assessed for quality using the AGREEII tool applied by two reviewers. Those with an average sum above 50 were included. In parallel, Cochrane reviews published by the Cochrane ENT group relevant for this training manual were identified. Where neither of the above two were applicable or all required information not available, other systematic reviews were sought.

All information extracted from these sources was shared with the expert group during technical working group meetings, and their applicability in low- and middle-income settings discussed prior to their inclusion.

Due to a paucity of guidelines for hearing screening in adults, a Delphi survey was conducted to inform the selection of tests. Textbooks were referred to for description of clinical procedures that are widely known and accepted as the gold-standard, such as examination of ear and audiometry. The textbooks were identified based on expert recommendations. Only those textbooks that provided the sources of information were included.

The information sources used are listed in table 1 and summary of experts and their declaration interest are summarized in table 2.

Table 1: List of information sources

Type of source	References
<p>WHO evidence-based guidelines and technical products</p>	<ol style="list-style-type: none"> 1. World Health Organization. WHO recommendations on maternal and newborn care for a positive postnatal experience. Available at https://www.who.int/publications/i/item/9789240045989, accessed 19 February 2023. 2. World Health Organization. Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity. Available at https://www.who.int/publications/i/item/9789241550109, accessed 19 February 2023. 3. World Health Organization; Geneva: 2014. Childhood hearing loss Integrated Management of Childhood Illness: distance learning course. https://apps.who.int/iris/handle/10665/104772. 4. World Health Organization; Geneva: 2012. Recommendations for Management of Common Childhood Conditions: Evidence for Technical Update of Pocket Book Recommendations. https://apps.who.int/iris/handle/10665/44774. 5. World Health Organization. Integrated care for older people (ICOPE): guidance for person-centred assessment and pathways in primary care. Available at https://www.who.int/publications/i/item/WHO-FWC-ALC-19.1, accessed 19 February 2023. 6. World Health Organization. Hearing screening: considerations for implementation. Available at https://www.who.int/publications/i/item/9789240032767, 19 February 2023. 7. World Health Organization 2023. Package of Interventions for Rehabilitation: sensory conditions (approved, in publication) 8. World Health Organization; Geneva: 2021. World Report on Hearing. https://www.who.int/publications/i/item/world-report-on-hearing 9. World Health Organization; Geneva: 2021. World Report on Ageing. https://apps.who.int/iris/handle/10665/186463.

Evidence-based guidelines (with AGREE II average sum score >50)

1. **Aural Rehabilitation Clinical Practice Guideline** Development Panel, Basura G, Cienkowski K, Hamlin L, Ray C, Rutherford C, Stamper G, Schooling T, Ambrose J. American Speech-Language-Hearing Association Clinical Practice Guideline on Aural Rehabilitation for Adults with Hearing Loss. *Am J Audiol*. 2022 Nov 14;1-51. doi: 10.1044/2022_AJA-21-00252. Epub ahead of print. PMID: 36374028.
2. Grine K, Stephens M. **A guideline for managing disorders of the ear: pinna and canal**. *J Fam Pract*. 2020 Jul/Aug;69(6): E1-E6. PMID: 32724914.
3. The Rotherham NHS Foundation Trust: **Otoscopy Guidelines**. Available at http://www.earcarecentre.com/uploadedFiles/Pages/Health_Professionals/Protocols/Otoscopy%20Guideline.pdf, accessed on 19 February 2023.
4. Chang P, Pedler K. **Ear examination--a practical guide**. *Aust Fam Physician*. 2005 Oct;34(10):857-62. PMID: 16217573.
5. Rosenfeld RM, Shin JJ, Schwartz SR, et al. **Clinical Practice Guideline: Otitis Media with Effusion** (Update). *Otolaryngology–Head and Neck Surgery*. 2016;154(1_suppl): S1-S41. doi:10.1177/0194599815623467.
6. British Society of Audiology. **Practice Guidance: Behavioural Observational Audiometry**. Available at <https://www.hincyp.scot.nhs.uk/wp-content/uploads/2020/07/7.-Audiology-OD104-78BSA-Practice-Guidance-Behavioural-Observation-Audiometry-FINAL-Review-2024.pdf>, accessed on 19 February 2023.
7. British Society of Audiology **Assessment Guidelines for the Distraction Test of Hearing**. Available <https://www.thebsa.org.uk/resources/protocol-distraction-test-hearing/>, accessed on 19 February 2023.
8. University Hospitals Sussex NHS Foundation Trust. **Instillation of ear drops**. Available at <https://www.uhsussex.nhs.uk/content/uploads/2021/05/Instillation-of-ear-drops-1.pdf>, accessed on 19 February 2023.
9. The Joint Committee on Infant Hearing. Year 2019 Position Statement: **Principles and Guidelines for Early Hearing Detection and Intervention Programs**. *DOAJ*. 2019; 4(2): 1–44.
10. Suzuki HG, Dewez JE, Nijman RG, Yeung S. **Clinical practice guidelines for acute otitis media in children: a systematic review and appraisal of European national guidelines**. *BMJ Open*. 2020;10(5): e035343. Published 2020 May 5. doi:10.1136/bmjopen-2019-035343
11. Wen C, Zhao X, Li Y, Yu Y, Cheng X, Li X, Deng K, Yuan X, Huang L. **A systematic review of newborn and childhood hearing screening around the world: comparison and quality assessment of guidelines**. *BMC Pediatr*. 2022 Mar 29;22(1):160. doi: 10.1186/s12887-022-03234-0. PMID: 35351033; PMCID: PMC8962144
12. Kamenov K, Chadha S. **Methodological quality of clinical guidelines for universal newborn hearing screening**. *Dev Med Child Neurol*. 2021;63(1):16-21. doi:10.1111/dmcn.14694

<p>Cochrane reviews and articles based on systematic reviews</p>	<ol style="list-style-type: none"> 1. Lieu JEC, Kenna M, Anne S, Davidson L. Hearing Loss in Children: A Review. JAMA. 2020;324(21):2195-2205. doi:10.1001/jama.2020.17647. 2. Jones SEM, Mahendran S. Interventions for acute auricular haematoma. Cochrane Database of Systematic Reviews 2004, Issue 2. Art. No.: CD004166. DOI: 10.1002/14651858.CD004166.pub2. 3. Kaushik V, Malik T, Saeed SR. Interventions for acute otitis externa. Cochrane Database of Systematic Reviews 2010, Issue 1. Art. No.: CD004740. DOI: 10.1002/14651858.CD004740.pub2. 4. Venekamp RP, Burton MJ, van Dongen TMA, van der Heijden GJ, van Zon A, Schilder AGM. Antibiotics for otitis media with effusion in children. Cochrane Database of Systematic Reviews 2016, Issue 6. Art. No.: CD009163. DOI: 10.1002/14651858.CD009163.pub3. 5. Perera R, Glasziou PP, Heneghan CJ, McLellan J, Williamson I. Autoinflation for hearing loss associated with otitis media with effusion. Cochrane Database of Systematic Reviews 2013, Issue 5. Art. No.: CD006285. DOI: 10.1002/14651858.CD006285.pub2. 6. Ferguson MA, Kitterick PT, Chong LY, Edmondson-Jones M, Barker F, Hoare DJ. Hearing aids for mild to moderate hearing loss in adults. Cochrane Database Syst Rev. 2017 Sep 25;9(9):CD012023. doi: 10.1002/14651858.CD012023.pub2. PMID: 28944461; PMCID: PMC6483809. 7. Campbell R, MacSweeney M, Waters D. Sign language and the brain: a review. J Deaf Stud Deaf Educ. 2008 Winter;13(1):3-20. doi: 10.1093/deafed/enm035. Epub 2007 Jun 29. PMID: 17602162. 8. Barker F, Mackenzie E, Elliott L, Jones S, de Lusignan S. Interventions to improve hearing aid use in adult auditory rehabilitation. Cochrane Database Syst Rev. 2016 Aug 18;2016(8):CD010342. doi: 10.1002/14651858.CD010342.pub3. PMID: 27537242; PMCID: PMC6463949. 9. Aaron K, Cooper TE, Warner L, Burton MJ. Ear drops for the removal of ear wax. Cochrane Database of Systematic Reviews 2018, Issue 7. Art. No.: CD012171. DOI: 10.1002/14651858.CD012171.pub2
<p>Textbooks</p>	<ol style="list-style-type: none"> 1. Watkinson J., Clarke R. (Ed.). (2018). Scott-Brown's Otorhinolaryngology and Head and Neck Surgery, Eighth Edition 3 volume set. Routledge. 2. Katz, J. (2014). Handbook of clinical audiology (7th ed.). Lippincott Williams and Wilkins. 3. Hogan C.J., Tadi P. (2022). Ear Examination. StatPearls. 4. Lotterman S., Sohal M. (2022). Ear Foreign Body Removal. StatPearls. 5. Sommerfeldt J., Kolb C. M. (2022). Hearing Loss Assessment in Children. StatPearls.

<p>Other peer-reviewed articles (not based on systematic reviews)</p>	<ol style="list-style-type: none"> 1. GBD 2019 Hearing Loss Collaborators. Hearing loss prevalence and years lived with disability, 1990–2019: findings from the Global Burden of Disease Study 2019. <i>The Lancet</i>. (2021). doi: 10.1016/S0140-6736(21)00516-X. 2. Wilson BS, Tucci DL, Merson MH, O’Donoghue GM. Global hearing health care: new findings and perspectives. <i>Lancet</i>. 2017 Dec 2;390(10111):2503-2515. doi: 10.1016/S0140-6736(17)31073-5. Epub 2017 Jul 10. PMID: 28705460. 3. What is primary care? <i>J Public Health Policy</i>. 1983 Jun;4(2):129-34. PMID: 6885995. 4. American Speech-Language-Hearing Association. How Does Your Child Hear and Talk? Available at https://www.asha.org/public/speech/development/chart/, accessed 15 February 2023. 5. Kamenov K, Martinez R, Kunjumen T, Chadha S. Ear and Hearing Care Workforce: Current Status and its Implications. <i>Ear Hear</i>. 2021 Mar/Apr;42(2):249-257. doi: 10.1097/AUD.0000000000001007. Erratum in: <i>Ear Hear</i>. 2021 Jun 18;42(5):1445. PMID: 33480624. 6. O’Donovan J, Verkerk M, Winters N, Chadha S, Bhutta MF. The role of community health workers in addressing the global burden of ear disease and hearing loss: a systematic scoping review of the literature. <i>BMJ Glob Health</i>. 2019 Mar 1;4(2): e001141. doi: 10.1136/bmjgh-2018-001141. PMID: 30899572; PMCID: PMC6407559. 7. Davis A, McMahon CM, Pichora-Fuller KM, et al. Aging and Hearing Health: The Life-course Approach. <i>Gerontologist</i>. 2016;56 Suppl 2(Suppl 2): S256-S267. doi:10.1093/geront/gnw033. 8. Bhutta MF. Models of service delivery for ear and hearing care in remote or resource-constrained environments. <i>J Laryngol Otol</i>. 2019 Jan;133(1):39-48. doi: 10.1017/S0022215118002116. Epub 2018 Dec 18. PMID: 30558687. 9. Bhutta MF, Bu X, de Muñoz PC, Garg S, Kong K. Training for hearing care providers. <i>Bull World Health Organ</i>. 2019 Oct 1;97(10):691-698. doi: 10.2471/BLT.18.224659. Epub 2019 Aug 20. PMID: 31656334; PMCID: PMC6796672. 10. Humes LE. The World Health Organization’s hearing-impairment grading system: an evaluation for unaided communication in age-related hearing loss. <i>Int J Audiol</i>. 2019;58(1):12-20. doi:10.1080/14992027.2018.1518598. 11. Sánchez D, Adamovich S, Ingram M, Harris FP, de Zapien J, Sánchez A, Colina S, Marrone N. The Potential in Preparing Community Health Workers to Address Hearing Loss. <i>J Am Acad Audiol</i>. 2017 Jun;28(6):562-574. doi: 10.3766/jaaa.16045. PMID: 28590899; PMCID: PMC6800024.
<p>WHO webpages</p>	<ol style="list-style-type: none"> 1. World Health Organisation. Primary Care. Available at https://www.who.int/teams/integrated-health-services/clinical-services-and-systems/primary-care, accessed 19 February 2023. 2. World Health Organisation. Deafness and hearing loss. Available at https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss, accessed 19 February 2023. 3. Health Organization; Geneva: 2016. Childhood hearing loss: strategies for prevention and care. https://apps.who.int/iris/handle/10665/204632.

Primary ear and hearing care training manual: management of conflict of interest

All members of the technical working group (TWG) and peer reviewers completed and submitted a WHO Declaration of Interests form and signed confidentiality undertakings prior to attending any TWG meetings and review. The WHO department for Noncommunicable diseases reviewed and assessed the submitted declarations of interest and performed an internet search to identify any obvious public controversies or interests that may lead to compromising situations. If additional guidance on management of any declaration or conflicts of interest had been required, the department would have consulted with colleagues in Office of Compliance, Risk Management and Ethics. If deemed necessary, individuals found to have conflicts of interest, financial or non-financial, would have been excluded from participation on any topics where interests were conflicting. The management of conflicts of interest was reviewed throughout the process. TWG members were required to update their Declaration of Interest, if necessary, before each meeting. Declared interests of the TWG members and reviewers are summarized below. No conflict of interest was identified.

Table 2: Declaration of interests

Name	Expertise	Disclosure of interest	Management of conflict of interest
Arun Agarwal	Community ENT	None declared	None identified
Mazin Al-Khabori	ENT	None declared	None identified
Mahmooh Bhutta	ENT	Employed by University of Sussex. Research funds	None identified
Xingkuan Bu	ENT, hearing screening	None declared	None identified
Priya Carling	Audiology	None declared	None identified
Patricia Castellanos de Muñoz	Community audiology	None declared	None identified
Oh Chunghyeon	ENT	None declared	None identified
Chitra Chander	Public health	Paid consultancy (WHO)	None identified
Jackie Clark	Audiology	None declared	None identified
Victor De Andrade	Audiology	None declared	None identified
Carolina Der	ENT	None declared	None identified
Uta Fröschl	ENT	Employed by CBM	CBM directly supported field testing of the manual through technical and financial contributions. This did not pose a conflict as the content and structure of the manual was agreed prior to this.
Suneela Garg	Public health	Research funds	None identified
Rachael Hapunda	Primary care, ENT	Paid consultancy (WHO)	None identified

Sally Harvest	Lived experience of hearing loss	Research funds	None identified
Linda Hood	Audiology	None declared	None identified
Isaac Macharia	Community ENT	None declared	None identified
Amarilis Meléndez	ENT	None declared	None identified
Norberto Martinez	ENT and audiology	None declared	None identified
Pallavi Mishra	Health systems	Paid consultancy (WHO)	None identified
Serah Ndwega	Community audiology	None declared	None identified
James O'Donovan	Primary care	None declared	None identified
Hubert Ramos	Audiology	None declared	None identified
Diego Santana-Hernández	Community ENT	Employed by CBM	CBM directly supported field testing of the manual through technical and financial contributions. This did not pose a conflict as the content and structure of the manual was agreed prior to this.
Paige Stringer	Lived experience of hearing loss	None declared	None identified
De Wet Swanepoel	Audiology, digital health	Co-founder hearX digital hearing technologies	None identified
George Tavartkilaze	Audiology	None declared	None identified

