

## STANDARD TREATMENT WORKFLOW (STW)

# Management of Hearing Impairment in Pediatric Age Group (0 – 12 Years)

Alok Thakar<sup>1</sup>, Anupam Mishra<sup>2</sup>, A Ramesh<sup>3</sup>, Harpreet Kochar<sup>4</sup>, Col B. K. Prasad<sup>5</sup>, Anuja Bhargava<sup>6</sup>, Prem Sagar<sup>7</sup>

<sup>1</sup>All India Institute of Medical Sciences, Delhi, <sup>2</sup>King George's Medical, Lucknow, <sup>3</sup>St John's Medical College, Bangalore, <sup>4</sup>Private Practice, Greater Noida, <sup>5</sup>Command Hospital, Lucknow, <sup>6</sup>Ira Medical College, Lucknow, <sup>7</sup>All India Institute of Medical Sciences Delhi

### CORRESPONDING AUTHOR

Dr Alok Thakar, All India Institute of Medical Sciences, Delhi

Email: [drathakar@gmail.com](mailto:drathakar@gmail.com)

### CITATION

Thakar A, Mishra A, Ramesh A, Kochar H, Prasad BK, Bhargava A, Sagar P. Management of Hearing Impairment in Pediatric Age Group (0 – 12 Years). Journal of the Epidemiology Foundation of India. 2024;2(1Suppl):S159-S160.

DOI: <https://doi.org/10.56450/JEFI.2024.v2i1Suppl.080>

This work is licensed under a Creative Commons Attribution 4.0 International License.

©The Author(s). 2024 Open Access

### DISCLAIMER

This article/STW, was originally published by Indian Council of Medical Research (ICMR) under Standard Treatment Workflow. The reprinting of this article in Journal of the Epidemiology Foundation of India (JEFI) is done with the permission of ICMR. The content of this article is presented as it was published, with no modifications or alterations. The views and opinions expressed in the article are those of the authors and do not necessarily reflect the official policy or position of JEFI or its editorial board. This initiative of JEFI to reprint STW is to disseminate these workflows among Health Care Professionals for wider adoption and guiding path for Patient Care.

October 2024



## Standard Treatment Workflow (STW) for the Management of HEARING IMPAIRMENT IN PEDIATRIC AGE GROUP (0 - 12 YEARS)

ICD 10 H90.5

Disabling hearing impairment (51 or more dB HL in better ear) may affect language development and learning outcomes and hence needs urgent intervention

### WHEN TO SUSPECT IN CHILDREN

1. Parental concern about delayed speech, language, and developmental delay (refer to red flags)
2. Family history of Hearing Loss (HL)
3. Exposure to ototoxic drugs/ hyperbilirubinemia requiring exchange transfusion/ Neonatal ICU stay for > 3days.
4. In-utero infections (CMV/ rubella/ syphilis/ herpes/ toxoplasmosis)
5. Syndromes (NF) Or neurodegenerative disorders (Hunter syndrome, FA) associated with HL
6. Post-natal infection known to cause HL (Meningitis)
7. Head Trauma
8. Recurrent/persistent (>=3 months) middle ear disease
9. Chemo/ Radiotherapy to head and neck



### UNIVERSAL HEARING SCREENING FOR CONGENITAL DEAFNESS

- Community based hearing screening:
  - i. May be co-ordinated with immunization schedule
  - ii. By primary health care workers.
  - iii. Using calibrated noisemakers/ toys
- All children who fail preliminary screen to undergo detailed evaluation at health care facility.

### EVALUATION

#### ESSENTIAL

1. Clinical examination to look for ear canal deformities, tympanic membrane and

### COMMON CAUSES OF HL

1. Impacted wax
2. Middle ear fluid associated with

## Standard Treatment Workflow (STW) for the Management of HEARING IMPAIRMENT IN PEDIATRIC AGE GROUP (0 - 12 YEARS) ICD 10 H90.5

Disabling hearing impairment (51 or more dB HL in better ear) may affect language development and learning outcomes and hence needs urgent intervention

### WHEN TO SUSPECT IN CHILDREN

1. Parental concern about delayed speech, language, and developmental delay (refer to red flags)
2. Family history of Hearing Loss (HL).
3. Exposure to ototoxic drugs/ hyperbilirubinemia requiring exchange transfusion/ Neonatal ICU stay for > 3days.
4. In-utero infections (CMV/ rubella/ syphilis/ herpes/ toxoplasmosis)
5. Syndromes (NF) Or neurodegenerative disorders (Hunter syndrome, FA) associated with HL
6. Post-natal infection known to cause HL (Meningitis)
7. Head Trauma
8. Recurrent/ persistent (>=3 months) middle ear disease
9. Chemo/ Radiotherapy to head and neck



### UNIVERSAL HEARING SCREENING FOR CONGENITAL DEAFNESS

- Community based hearing screening:
  - i. May be co-ordinated with immunization schedule
  - ii. By primary health care workers.
  - iii. Using calibrated noisemakers/ toys
- All children who fail preliminary screen to undergo detailed evaluation at health care facility.

### EVALUATION

#### ESSENTIAL

1. Clinical examination to look for ear canal deformities, tympanic membrane and middle ear status by otoscopy/ otoendoscopy.
2. Age appropriate audiological/ behavioral observation tests in a soundproof room by audiologist/ ENT specialist.
3. Tympanic membrane mobility test/ tympanometry.

### COMMON CAUSES OF HL

1. Impacted wax
2. Middle ear fluid associated with adenoid hypertrophy/ cold climate
3. Tympanic membrane perforation
4. Sensorineural Hearing loss (SNHL) due to various causes as indicated earlier

### RED FLAGS POINTING FOR URGENT HEARING EVALUATION

- 6months- no head turning to the side of calling
- 1yr- no babbling/ speech like sound production
- 1.5yrs- not saying mama/papa/dada or other names
- 2yrs- not pointing to pictures/ body parts when named or speaking less than 10 words
- 3 yrs- does not understand action words or not asking for things by names or not speaking small sentences.
- At any age- has regressed or lost previously acquired speech/ language milestones

### MANAGEMENT

#### GUIDING PRINCIPLES

#### CONDUCTIVE HL

Wax removal under direct vision by ENT specialist relieves hearing impairment

Appropriate surgery is to be planned for tympanic membrane perforation

Middle ear fluid (OME) may be associated with adenotonsillar disease which needs to be treated. Initially medical treatment and surgery to be considered for OME persisting for more than 3months/ earlier in the presence of speech and language delay

For non-surgical condidates/ delayed surgical management, amplification by hearing aid to be reinforced in bilateral CHL

#### SNHL

Appropriate amplification, preferential seating in classroom

Periodic evaluation for hearing aid users for mould fitting and amplification settings

Screening for developmental delay by pediatrician/ psychologist

### DIVISION OF RESPONSIBILITIES

#### PHC LEVEL

- Suspect HL
- Initial evaluation
- Referral if initial evaluation is suggestive of HL
- Follow up of rehabilitated/ treated patients with HL
- Prevention of HL

#### TERTIARY LEVEL

- Surgical intervention options : Cochlear implant / BAHA (as per ADIP guidelines)
- Interdisciplinary team based interventions in children with multiple disabilities.

#### DH LEVEL

1. Audiometric evaluation by Audiologist/ Otolaryngologist
2. Hearing aid dispensing (mould fitting and HA programming)
3. Rehabilitation by speech therapist
4. Appropriate surgery for CHL
5. Training programme for parents of hearing impaired children to enhance pre-school language development

#### QUALITY ASSESSMENT PARAMETERS

- Short term: Quality of amplification using electroacoustic objective measures and culturally appropriate subjective questionnaire tools
- Long term (Desirable) : Use CBR matrix based measurement for ensuring holistic rehabilitation

### FOLLOW UP SERVICES

1. Home visits by Health Worker/ASHA to ensure utilization of assistive devices and support parents to enhance language development.
2. School visits to educate teachers and normally hearing children to include their peers with hearing disability in the school environment
3. Home/ school visit by social worker for evaluation of social/ educational/ livelihood/ justice and empowerment domains of the child

### KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

#### ABBREVIATIONS

**ADIP** : Assistance to disabled persons for purchase/ fitting of aids and appliances

**BAHA** : Bone Anchored Hearing Aid  
**CBR** : Community Based Rehabilitation  
**CMV** : Cyto Megalo Virus

**FA** : Friedreich Ataxia  
**NF** : NeuroFibromatosis  
**OME** : Otitis Media with Effusion

#### REFERENCES

- \* Indian Council of Medical Research. Audiological evaluation protocols. Task force project on prevalence and etiology of hearing impairment. New Delhi. 2015
- \* Ramesh A, Jagdish C, Sunan Rao PN et al. Low cost calibrated mechanical noisemaker for hearing screening in resource constrained settings. Indian Journal of Medical Research. 2012; 135: 170 - 176.
- \* Rathna.B.Shetty. Manual for training parents of hearing impaired children (Kannada : Kivadu makkaige kaisuva vidhana). Parents association of deaf children. Mysore.
- \* Chapal Michasrabis, Karen Heinicke Motsch (eds.) Towards community based inclusive development. World Health Organisation: 2010.
- \* Margaret Lavina Fernandes. Guidelines to establish a community based rehabilitation program for hearing impaired children in medically underserved areas. St. John's Medical Journal, 2018 (1), 5 : 14 - 27
- \* ADIP Guidelines - <https://disabilityaffairs.gov.in/content/page/adip-scheme.php>

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal ([stw.icmr.org.in](http://stw.icmr.org.in)) for more information.  
© Indian Council of Medical Research and Department of Health Research, Ministry of Health & Family Welfare, Government of India.