

**B. Ed. Spl. Ed. (M. R. / H. I. / V. I)-
ODL Programme**

AREA - C

**C-12 : ASSESSMENT AND IDENTIFICATION OF
NEEDS [HEARING IMPAIRMENT]**



**A COLLABORATIVE PROGRAMME OF
NETAJI SUBHAS OPEN UNIVERSITY
AND
REHABILITATION COUNCIL OF INDIA**



AREA - C ● DISABILITY SPECIALISATION COURSES

COURSE CODE - C-12 H.I.

ASSESSMENT AND IDENTIFICATION OF NEEDS

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The Self Instructional Material (SIM) is prepared keeping conformity with the B.Ed.Spl. Edn.(MR/HI/VI) - ODL Programme as prepared and circulated by the Rehabilitation Council of India, New Delhi and adopted by NSOU from the 2015-2017 academic session.

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Dr. Ashit Baran Aich
Registrar (Actg.)



Netaji Subhas Open University

From the Vice-Chancellor's Desk

Dear Students, from this Academic Session (2015-17) the Curriculum and Course Structure of B. Ed.- Special Education have been thoroughly revised as per the stipulations which featured in the Memorandum of Understanding (MoU) between the Rehabilitation Council of India (RCI) and the National Council for Teacher Education (NCTE). The newly designed course structure and syllabus is comprehensive and futuristic has, therefore, been contextualized and adopted by NSOU from the present academic session, following the directives of the aforesaid national statutory authorities.

Consequent upon the introduction of new syllabus the revision of Self Instructional Material (SIM) becomes imperative. The new syllabus was circulated by RCI for introduction in the month of June, 2015 while the new session begins in the month of July. So the difficulties of preparing the SIMs within such a short time can easily be understood. However, the School of Education of NSOU took up the challenge and put the best minds together in preparing SIM without compromising the standard and quality of such an academic package. It required many rigorous steps before printing and circulation of the entire academic package to our dear learners. Every intervening step was meticulously and methodically followed for ensuring quality in such a time bound manner.

The SIMs are prepared by eminent subject experts and edited by the senior members of the faculty specializing in the discipline concerned. Printing of the SIMs has been done with utmost care and attention. Students are the primary beneficiaries of these materials so developed. Therefore, you must go through the contents seriously and take your queries, if any, to the Counselors during Personal Contact Programs (PCPs) for clarifications. In comparison to F2F mode, the onus is on the learners in the ODL mode. So please change your mind accordingly and shrug off your old mindset of teacher dependence and spoon feeding habits immediately.

I would further urge you to go for other Open Educational Resources (OERs) - available on websites, for better understanding and gaining comprehensive mastery over the subject. From this year NSOU is also providing ICT enabled support services to the students enrolled under this University. So, in addition to the printed SIMs, the e-contents are also provided to the students to facilitate the usage and ensure more flexibility at the user end. The other ICT based support systems will be there for the benefit of the learners.

So please make the most of it and do your best in the examinations. However, any suggestion or constructive criticism regarding the SIMs and its improvement is welcome. I must acknowledge the contribution of all the content writers, editors and background minds at the SoE, NSOU for their respective efforts, expertise and hard work in producing the SIMs within a very short time.



Professor (Dr.) Subha Sankar Sarkar
Vice-Chancellor, NSOU

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University**

**AREA - C
C-12 : ASSESSMENT AND
IDENTIFICATION OF NEEDS**

C-12 □ Assessment and Identification of Needs

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Unit - 1 □ Early Identification of Hearing Loss : Needs & Strategies

1.1 Needs for Early Intervention

Hearing loss is a silent, hidden handicap in children. Children especially infants and toddlers cannot tell us what they are not hearing well, hence it's hidden. If undetected and untreated, this can lead to delayed in speech and language development, social and emotional problems and academic failure, therefore it's called a handicap. Detection of hearing loss as early as possible and as young as the new-born period can be applied for effective treatment which significantly reduces the handicap of hearing loss. However, since parents are unaware that an accurate hearing test can be received by any child even a new born infant, identification of a child's hearing loss is delayed.

During 1989 the United States federal government accepted a new commitment aimed at the reduction of the harmful effects of childhood hearing loss.

Research studies have demonstrated that early intervention with hearing impaired children results in improved language development, increased academic success and increased lifetime earnings. Since hearing impaired children who received early intervention require less costly special education services later, hence it is also economically beneficial.

Fitch et al (1982) state that the greater value of such programs may lie in the identification of increased numbers of children with mild to moderate conductive losses that are amenable to treatment.

Communication is learned in early infancy (Bloom & Lahey, 1978) which is essential for growth and language but the child's need for language and communication should not pressure parents into making hasty choices between program options.

In 1969 National Committee was formed of representatives from the Academy of Paediatrics, the Academy of Ophthalmology and Otolaryngology and the American Speech and Hearing Association charged with making recommendations for new born infant hearing screening.

The committee at that time addressed itself to the use of behavioural observation hearing screening tests that had been developed and described by Downs and Sterritt (1964) and Downs and Hemenway (1969).

More importance was given by the committee for the development of a high risk register for deafness. Richards and Robert (1967) stated that a high risk register to be efficient should identify a disease that is 14 times more prevalent in the register than in the general population.

Concept of high risk assumes identification of a small group of children who have a history of physical condition and identifies them as possessing a high chance of having the target handicap.

The high risk register were further recommended for a buttressed by a National Maternal and Child Health Conference that delineated Guidelines for Early Screening (Conference of Hearing Screening Services for Preschool Children, 1977). The conference reaffirmed the Joint Committee program and some supplementary suggestions were made. They are:

- a) Audiological follow ups of the high risk infants shall be made as soon as possible but certainly by 7 months.
- b) The mother child relationship shall be safeguarded by education and careful information in the first 4 months.
- c) Informed consent shall be obtained.
- d) Information shall be provided on what to look for in later infancy.
- e) The development and implementation of adequate identification and diagnostic procedures related to hearing impairment be undertaken by public health agencies.

The Joint Committee on Infant Hearing met again in 1982 and in 1990 to propose new position statements relevant to practices of identifying the hearing impaired neonate and infant.

The Joint Committee on Infant Hearing (1990) represented the American Speech Language Hearing Association (ASHA), American Academy of Paediatrics, the American Academy of Otolaryngology Head and Neck Surgery, the Council on Education of the Deaf and the directors of Speech and Hearing Programs in state Health and welfare agencies.

Recent research and new legislation suggest the need for expansion and clarification of the 1982 criteria. The 1990 statement expands the risk criteria and makes recommendations for the identification and management of hearing impaired neonates and infants. It has been recognized by the committee that the recommended protocols may not be appropriate for all institutions so modifications in screening approaches

may be necessary for accommodation of specific needs of a given facility.

In the development of a screening program, factors such as cost and availability of equipment, personnel and follow up services are important for considerations.

Risk Criteria :

Neonates (birth-28 days)

The risk factors for the identification of those neonates who are at risk for sensorineural hearing impairment include the following:

1. Family history of congenital or delayed onset childhood sensorineural impairment.
2. Congenital infection known or suspected to be associated with sensorineural hearing impairment such as toxoplasmosis, syphilis, rubella, cytomegalovirus and herpes.
3. Craniofacial anomalies including morphologic abnormalities of the pinna and ear canal.
4. Birth weight less than 1500 grams
5. Hyperbilirubinemia at a level exceeding indication for exchange transfusion.
6. Ototoxic medication including but not limited to the aminoglycosides used for more than 5 days and loop diuretics used in combination with aminoglycosides.
7. Bacterial meningitis
8. Severe depression at birth may include infants with Apgar scores of 0-3 at 5 minutes or those who fail to initiate spontaneous respiration by 10 minutes of those with hypotonia persisting to 2 hours of age.
9. Prolonged mechanical ventilation for a duration equal to or greater than 10 days.
10. Stigmata or other findings associated with a syndrome known to include sensorineural hearing loss.

Risk Criteria-

Infants (29 days-2 years): The factors that identify those infants who are at risk for sensorineural hearing impairment include the following:

1. Parent /caregiver concern regarding hearing speech language and /or developmental delay.

2. Bacterial meningitis
3. Neonatal risk factors that may be associated with progressive sensorineural hearing loss (e.g cytomegalovirus prolonged mechanical ventilation and inherited disorders)
4. Head trauma especially with either longitudinal or transverse fracture of the temporal bone.
5. Stigmata of other findings associated with syndromes known to include sensorineural hearing loss
6. Ototoxic medications including but not limited to the aminoglycosides used for more than 5 days (e.g gentamicin, tobramycin, kanamycin, streptomycin) and loop diuretics used in combination with aminoglycosides.
7. Children with neurodegenerative disorders such as neurofibromatosis myoclonic epilepsy , Friedrich's ataxia, Huntington chorea, Werdnig-Hoffmann disease,
8. Childhood infectious diseases known to be associated with sensorineural hearing loss (e.g., mumps, measles).

JCIH met again in 1994, 2000, 2007 to propose new position statements. According to JCIH (2007) families of infants with all degrees of hearing loss should be offered early intervention. EHDI should be linked to the recognised point of entry for infants with a confirmed hearing loss, and be intervened by professionals with expertise in hearing loss including educators of the deaf and speech language professionals. Appropriate interventions offered include both home based and centre based options. A comprehensive guidelines for early hearing detection and intervention programs has been stated by recent JCIH 2013 to meet the needs of children who are deaf or hard of hearing for establishing strong early intervention systems with appropriate expertise

Three groups of people must work together.

- a) Parents are in the best position to identify their child's hearing difficulties. Our job can be improvised by making the parents aware of the danger signals and of the available sources that are applicable for them.
- b) Physicians are needed to be more responsive regarding the parent's concerns about their child's hearing.
- c) Initiation of high risk screening programs can help state agencies. Research indicates that up to 75% of infants born deaf or with hearing impairments can be identified by such pro grams.

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1.2 Overview to Behavioural and Objective Techniques in Screening Hearing Loss

Hearing loss is not a visible disability, and even normal hearing children may not begin talking upto 2 years of age. Thus if hearing loss is not detected through newborn hearing screening programs, it often goes undetected after 18 months of age, especially in children who have no medical ailments and/or other disabilities.

In concert with recommendations of the Joint Committee of Infant Hearing (JCIH-2000) and the National Institute of Deafness and other Communication Disorder (NIDCD-1997) early hearing detection and intervention programs must use screening measures that demonstrate certain response and measurement characteristics. These are as follows:-

- 1) The response should be capable of being measured reliably under a wide variety of conditions.
- 2) The response should have predictive value i.e it should be present in nearly all normal -hearing infants and abnormal in nearly all infants with hearing loss.
- 3) A screening procedure should use objective criteria to define both the method for a technically correct screening test and the guideline for a “**pass versus refer**” outcome.
- 4) The procedure should achieve a **low referral rate for follow-up** , prevent unnecessary costs and parental anxiety.

Types of hearing screening procedures

A variety of procedures are presently used in hearing screening programs for children from infancy through high school. Not a single procedure is effective by itself in identifying all hearing losses.

1) **Developmental checklist :-**

It has been used to obtain information from parents or other caregivers regarding the auditory behaviours of children. It is useful to obtain functional information regarding auditory and oral development, especially for very young children or children who are difficult to assess.

Northern and Downs (1974)

At 0 to 4 months - When he was sleeping quiet, did sudden noise awaken him momentarily ? did he cry at very loud noise?

At 4 to 7 months - Did he begin to turn towards sound that was out of his sight? Did he keep on making babbling noises of a large variety at 5 and 6 months?

At 7 to 9 months - Did he turn to find the source of sounds out of his vision? Did he gurgle or coo to voices or sounds that he could not see? Did he make sounds with rising and falling inflections?

At 9 to 13 months - Did he turn and find a sound anywhere behind him? Did he begin to imitate some sounds what specific sounds did he say ?

At 13 to 24 months- Did he hear you when you called from another room? Did his voice sound normal?

2 HIGH RISK RESISTER: -

Professional leadership in infant hearing and early detection has been largely provided by the Joint Committee infant hearing (JCIH)

They provided historical risk factors for hearing loss as follows 1972

1. Family history
2. Hyper bilirubinemia requiring exchange.
3. Congenital infection (TORCH -toxoplasmosis. Other includes syphilis, rubella, cytomegalovirus, herpes simplex)
4. Craniofacial anomalies (Defects)
5. Birth weight less than 1500 grm 1982
6. Bacterial meningitis
7. Apgar score of <3 at 5 minutes 1990
8. Ototoxic medications including, but not limited to the amino glycosides used for more than 5 days.
9. Prolonged mechanical ventilation for 10 days or more
10. Associated with syndrome

1994 a change to Apgar score of 0 to 4 at 5 minutes

1994 b ototoxic medication, including but not limited to , the amino glycosides, used in multiple courses

1994 c mechanical ventilation lasting 5 days bbor longer

JCIH 2000 indicators for use in neonates (birth through age 28 days) where universal hearing screen is not yet available .

1. An illness or condition requiring admission of 48 hours or longer to NICU
2. Stigmata or other findings associated with a syndrome known to include a snsory-nural and or conductive hearing loss
3. Family history or permanent childhood sensory- neural hearing loss
4. 4. Craniofacial abnormalities ,including those with morphologic abnormalities of pinna and ear canal
5. In utero infection such as cytomegalovirus ,herpes,toxoplasmosis , or rubella

3) AUDITORY BRAINSTEM RESPONSE

ABR and Automated auditory brainstem response (AABR ex ALGO -1 plus) are electrophysiological procedures used for hearing screening , based upon brainstem response to sound.

When used as a screening procedure ABR primarily detect hearing losses that are greater than 30dB in the frequency range 1000 to 4000 Hz with a sensitivity 100% and specificity 96 to 98%.

ABR may be used to detect auditory neuropathy or neural condition disorders in newborns. Because ABR are reflective of auditory nerve and brainstem function, these infants can have an abnormal ABR screening result even when peripheral hearing is normal.

ABR MEASUREMENT PARAMETERS -

Guidelines for stimulus and acquisition parameters in newborn auditory screening with ABR are summarized below -

Parameter	Automated ABR System (screening) ALGO-I device	Conventional ABR system
Stimulus		

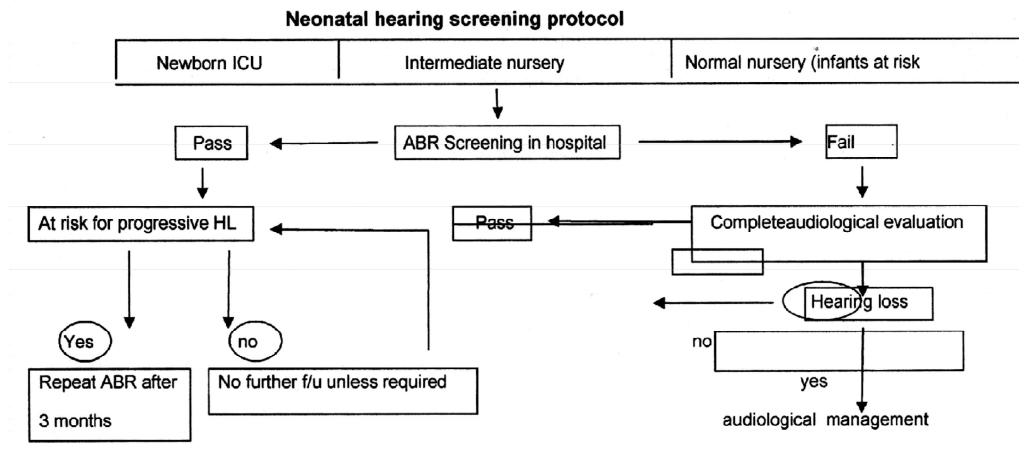
Transducer	Special design	Infants tubeophone
Type	Filtered click	Click /frequency specific tone burst stimuli
Duration	0.1 msec	0.1 msec
Rate	37/sec	37. I/sec
Polarity	Alternating	Rarefraction
Intensity	35dBnHL	35dBnHL
Ear	Monaural ,each	Monaural ,each
ACQUISITION		
Gain		100,000
Artifact reject	Yes	yes
Analysis time	20sec	ISsec
Filter settings		
High pass	50Hz	^5!15
Low pass	1400Hz	ISO0Hz
60Hz notch		no
Number of sweeps	500 to 1500	Variable 2000 /4000/up to 6000
Electrode placement		
Inverting	Fz	Fz
Noninverting	Back to the neck	Back to the neck
Ground	Fpz	Fpz

International test protocol for screening using ABR

The first component of test protocol is the method of determining which infants will be screened.

A primary objective of chart review is to identify which infants are at risk by careful inspection of available medical records.

The frequency with which chart reviews should be done depends on the volume of births and admission to the ICU and intermediate nursery for the hospital.



4) Otoacoustic emissions-Otoacoustic emissions are sounds that originate from the cochlea more precisely it generated by electromotile vibration (prestin) of the OHCs and propagate through the middle ear and into the ear canal, where they can be measured using a sensitive microphone.

Use of otoacoustic emissions (OAEs), a relatively recent technology for screening, involves measuring the integrity of the outer hair cells of the cochlea.

Transient evoked otoacoustic emission (TEOAE) and distortion product otoacoustic emission (DPOAE) both are used as effective measures in NICU and well-baby population but the DPOAEs has lower fail rates than TEOAEs (Rhodes et al 1999).

Both types of measurement are frequency specific; TEOAEs in the frequency range of 500 to 5000Hz and DPOAEs in the 1000 to 8000Hz range. (Gorge et al 1993, Probest et al 1987)

TEOAEs generally detect hearing loss at levels of 30dBHL or above, while DPOAEs are reported to detect hearing loss of 40dBHL or above (Gorge et al 1993, Probest et al 1987).

Abnormal middle ear conditions usually results in absent of OAEs.

5) Acoustic Immittance

Guidelines for screening were adopted by the American-Speech-Language-Hearing Association in 1997 that detailed Immittance procedural recommendation. In addition, the American Academy of Audiology wrote a position statement in 1992, “Audiologic Guidelines for the diagnosis and treatment of Otitis Media in children,” which was

submitted as the academy's formal recommendation for the development of the clinical practice guideline "Otitis Media with effusion in young children" (U.S. department of health and human service 1994)

Acoustic Immittance measurements have historically consisted of three procedures: tympanometric peak pressure, static admittance, and the acoustic reflex. Current screening for middle ear disorders consist primarily of the gradient (i.e. tympanometric width) and static admittance (tympanogram peak). Consideration should also be given to canal volume in the interpretation.

Pass and referral criteria must be established with consideration of the age and risk factors of the target population and with consideration of local medical tr Cannot be used to determine hearing sensitivity treatment philosophies.

Reffral criteria from the most recent ASHA guidelines(1997) are summarized in table-

Equivalent ear canal volume for children 1 to 7 yrs of age		
90% range for ears with and without tubes 5 th percentile-95 th percentile referral criteria	Pre- tube 0.3-0.9cm ³	Post -tube 1.0-5.5 cm ³
Ear canal volume Vec>1.0cm ³ and accompanied by flat tympanogram; do not refer if tube is in place or if TM perforation is under management of a physician		
Recommended initial tympanometric screening test criteria		
Infants	Ytm<0.2mmho or TW>235dapd (Ytm=peak admittance)	
1 year to school age	Ytm<0.3mmho or TW>200dapd	
6 years and older	Ytm<0.4mmho (when using +-400 dapa for comprehension)	

6) Visual reinforcement audiometry

Liden and kankkonen (1961) first coined the term 'Visual reinforcement audiometry'(VRA). This procedure as currently used employes lighted transparent toys which are flashed on simultaneously with the presentation of the auditory signal during a conditioning period. During the testing phase the light is flashed immediately following a response. Matkin (1974) reported that VRA is successful with 90% of both normal- hearing and hearing impaired children between the ages of 12 and 36 months. In

sound field, the loudspeakers on each side of the child produce the signals and the lights for localization.

7) Behavioral observation audiometry

Behavioral observation as a screening technique may be considered more of a functional measure of hearing ability because it requires the infant or child to respond to a variety of noise stimuli. In BOA, an infant's response is observed to a variety of moderate to high intensity stimuli, such as calibrated noisemakers, to observe startle, eye-widening, localization, or cessation of activity. As a screening tool, this procedure would likely have a high false-negative rate. Potentially missing many children with significant hearing loss.

Therefore, this procedure can no longer be recommended as a solitary screening tool.

8) Conditioned play audiometry (CPA)

In CPA, children learn to engage in an activity—putting rings on a spindle, dropping or stacking blocks, putting together simple puzzles—each time hear the test signals.

These activities are assumed to be interesting to children, are within their motor capability, and represent a specific behavior that is used to denote a response to a stimulus. The change in play audiometry is teaching the child to wait, listen and only respond with the play activity when the auditory signal is presented. Audiologic literature suggests that CPA is widely accepted among clinicians who practice pediatric audiology (Thomson et al 1989).

PROCEDURE	TARGET POPULATION	ADVANTAGES	DISADVANTAGES
Developmental	Birth 3 years; other difficulty to-assess population data about child's sensitivity of hearing	-Quick and easy to administer -provides functional	'-Does not correlate with actual hearing sensitivity
High risk register	Birth 2 years	-Quick and easy to administer -identifies infants to who require monitoring of hearing due to risk factors.	-only identifies 50% of hearing loss, -may require time consuming chart review.
History	All ages	Identifies medical, familial and other	Cannot be used to determine hearing

		developmental information that may affect hearing ability	sensitivity.
Visual inspection of the ear	All ages	Identifies structural abnormalities, ear canal drainage	Cannot be used to determine hearing sensitivity
ABR	All ages	-Requires minimal training -identifies high-frequency losses above 30dBHL -predicts hearing threshold	Expensive -May require sedation for children who cannot sit still for long periods. -Not frequency specific. -Difficult to interpret if central nervous system pathology present.
OAEs	Newborns, infants and toddlers, difficult to assess population	-identifies losses greater than 30dBHL (TEOA) Or 40dBHL(DPOAE) -minimal cooperation required -does not require sedation Frequency specific.	-Expensive -Measure only to cochlea -Cannot predict hearing threshold.
Pure tone screening	2.5years to adult	Identifies children who require further assessment, -results are generally reliable.	Not useful with children who have developmental problems. Require very quiet environment.
Acoustic immittance	6months or older middle ear function, -automated units are quick and easy administer, -minimal cooperation required	Valid indicator of	-Does not assess hearing sensitivity, -follow up protocols are controversial.
Behavioral observation	3months to 2 years; special population	-provides reasonably valid response to low level stimuli. -provides functional data about child's use of hearing.	Requires child cooperation may need repeated test session to obtain sufficient data to estimate hearing sensitivity.

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1.3 Team Members Involved in Hearing Screening and Their Role

Hearing loss is a hidden disability. It is hidden because children are not able to tell whether they are hearing or not. Some adults also do not want people to know about their hearing loss so they hide their problems. Hearing loss should be detected and identified as early as possible so that small children should not go undetected and miss their critical age. Critical age is considered 0-5years .During this period all aspects of development occurs like physical,motor,speech and language development, social and psychological development. This critical age has to be taken into account and has to be maximally used for the child's adequate development. By detecting hearing loss as early as possible, even as young as newborn infants effective rehabilitation can be undergone.

Hearing Loss in children is a serious concern as it interferes with the development of language. Language is a unique gift of nature for humans. The longer it takes for a hearing loss to go undetected the outcome becomes worse. Adequate speech and language therapy should be provided after amplification so as to develop proper speech and language skills. Our primary goal is that the child should develop communication skills. Many research studies have demonstrated that early intervention with hearing impairment children results in improved language development, increased academic success and increased quality of life.

Early Identification and Intervention of hearing loss is a team work and requires a group of professionals who should work rigorously towards the rehabilitation of the client. Reduced or defective hearing sensitivity causes a lot of communication problems. The effects of hearing loss is devastating as it causes many problems in the individual which includes total lack of communication leading to a variety of social and emotional discrepancies.

The rehabilitation team should include the following members who should work hand in hand for the successful intervention of the hearing impaired individual. The team includes :

- The health professional on whom parents depend for the general health care of the child, it is probably a **pediatrician**, who treats only children, or a family

practice physician, who treats adults as well as children in the family. This professional will not be able to help parents with the hearing loss itself. However he/she may treat inflammations and infections of the ear and upper respiratory system that can affect hearing, as well as other conditions that children may encounter.

- **The audiologist** must have a license to practice audiology. He/She specializes in the study of hearing disorders. An audiologist identifies the hearing loss, measures it, and aids in the habilitation of the deaf and/or hard of hearing person, by recommending appropriate hearing aids. Periodic hearing screening during the early childhood years increases the likelihood that children lost to follow-up from newborn screening, along with children presenting with post neonatal hearing loss, will receive the timely diagnostic and intervention services needed during the critical language learning years.
- **An ENT surgeon or otorhinolaryngologist** is a physician who specializes in diseases of the ear, nose, and throat. An E.N.T surgeon must examine a child to rule out any medical complications before parents purchase a hearing aid. An ENT should check every child periodically.
- **The service coordinator** is responsible for coordinating all services for the child and will serve as the person for parents to contact when seeking to obtain necessary services and assistance. The service coordinator is also required to assist parents in identifying and locating available services and service providers, and to inform parents (and families) of the availability of rehabilitation services.
- **A speech and language pathologist** specializes in the diagnosis and habilitation of speech and language problems. This team member may meet with a child on a regular basis to work on the fine points of speech and language development and speech correction. He/She will explain how parents can help with the child's speech and language development.
- **The teacher of the deaf or hard of hearing** should be certified by the State Department of Education to teach students who are deaf or hard of hearing. Parents should begin talking to these special teachers, from programs in their area, even if the child is only an infant. This person can help parents get started immediately with communication and language development, even if the hearing

aids have not yet arrived. Most areas have programs for infants and toddlers and their parents. Teachers in these programs will become one of the most valuable members of the team, providing home visits and one-on-one early intervention for parents and children

- **PARENTS** are the most important team members as because they will stay with the child throughout even if the professionals would leave. They are the most important people who will decide on the child's rehabilitation procedures. Parents are the best people who will identify a child's hearing difficulties. Some parents do not accept that their child has hearing loss. They have emotions like shock and denial. It is the professional's role to counsel these parents to overcome this problem. Parents together with help from the professionals will help decide the child's rehabilitation procedures and the hearing impaired child's future. Thus parents play very important role in the rehabilitation process.

1.4 Use of Checklist and Behavioral Observation in Early Identification of Hearing Loss by School Teacher (Congenital and Acquired)

Structure

1.6.1-Identifying Hearing Loss

1.6.2-Behavior Observation

1.6.3-Checklists

1.6.4-Check list of School Teachers Students Behaviour Observation Hearing Loss. (Congenital and Acquired)

1.6.4-1-STEP-A Observe Auditory Behaviours.

- **Additional information**
- **Appearance of the ears and**
- **Auditory and hearing behaviours of the Student's**

1.6.4-2-STEP-B Reviewing Medical and Educational Records.

B.1-Congenital factors

B.2-Acquired factors.

1.6.4-3-STEP-C: Interviewing the Family

1.6.4-4-STEP-D; Meeting with Family.

1.6.5-5-STEP-E: Referral for Medical Follow- Up

1.6.6-6-STEP-F-: Follow-Up Meeting to Discuss Medical Findings

1.6.1-Identifying Hearing Loss

Children with hearing impairments that can be challenging to educate and serve. Most learning comes through auditory channels and when these avenues are impaired incidental and direct learning is reduced. While the impact of the hearing impairment may not always be the primary impediment to learning it is a factor that has significant impact on a child's ability to learn by affecting their access to the physical, social, and

instructional environment. Use of appropriate modifications and instructional strategies can significantly increase access and ultimately development and achievement. Hearing help us our listening capacity of the sound knowledge in around of the world. Because our hearing mechanism is known as an auditory sensory pathway with the help of sensory pathway we receive and perceive the sound knowledge of the world. If affects that path way its call auditory impairment's. Children with auditory impairments may be having difficulty in hearing in both and one ear. Our hearing is a main sensory pathway through which speech and verbal communication develop. If child cannot hear perfectly so therefore he/she cannot speak individual and speak to others perfectly. So early detection of hearing impairment is important to child's overall development. Hearing loss is one of the most commonly unidentified and misdiagnosed conditions in early childhood because hearing impairment is a hidden problem and even when it is present in a child at birth, it cannot be suspected immediately as it is not seen overly. Only when the child grows up and fails to start speaking do the parents/caregivers realize that the child has a problem in hearing. That's why checklist is an essential part parents, caregivers and school teachers. Because Hearing screening checklists have been used to obtain the report of the parents, caregivers and school teachers to know about the auditory behavior pattern of their children. So therefore checklist most important tools of parents, caregivers and school teachers. Behavior observation or auditory behavior of children is being classified in different age level regard hearing status.

1.6.2-Behavior Observation

Human development in the first 3 years of life occurs with rapid changes in cognitive development, language, motor skills, and social/emotional skills. This foundation is so important that infant's caregivers must be aware of each child's developmental progress. In a child care setting, knowledge of a child's development is accomplished through the key processes of **auditory** behavior observation, developmental screening, and ongoing assessment. The child care consultant can play an important role in helping infant caregivers understand the definitions, key concepts, and processes that can support understanding the developmental progress of infants.

For behaviour observation to be meaningful and useful it must be objective and factual. The objective is Consultants can help caregivers understand they must document

only what they see and hear when recording information about a child. So actual behavior observations should include actions, language, gestures, facial expressions and creations.

Behavioral Observation Technique continues to be used even though they do not provide ear specific results for screening but is hearing screening checklists have been used to obtain the report of the school teachers, parents and caregivers regarding the auditory behavior of their children. The principle of this procedure change child's behavior after presentation of sound stimulus in different sound knowledge in around of the world.

1.6.3-Checklists

Checklists can be a great tool to monitor a child's hearing, speech, and language development. The different variety of checklist used for documenting children's development are beyond the scope of this module and the following checklist is basic standardized methods can be implemented with instruction to parents, caregivers and school teachers is behaviour observation or auditory behaviour checklist of children.

1.6.4 Check List of School Teacher's Student's Behavioural Observation Hearing Loss. (Congenital and Acquired)

1.6.4-1-STEP-A observe auditory behaviors

If you suspect that your student has hearing loss you should document those behaviors that lead you to believe that this is true. Below is a list of behaviors or characteristics typical of children who hearing loss. Check off those behaviors that are suspect, describe them if you think further explanation is needed and add any information you think pertinent to their sensory functioning and behaviors. So check lists of schools teacher's of student's behavioral observation hearing loss can be classified in **1) Additional information 2) Appearance of the ears and 3) Auditory and hearing behaviors of the Student's**

- **Additional information:** If you think further explanation is needed and add any information you think pertinent to their sensory functioning and behaviors. Write your information.....
- Appearance of the **Ears**

SLNO	2) Appearance of the Ears	Yes	No
1	Cleft lip or palate		
2	Malformations of head and neck		
3	Malformations of ears		
4	Frequent ear aches or infection		
5	Discharge from ears		

● **Auditory and hearing behaviors of the Student's**

SLNO	3) Auditory and hearing behaviors of the Student's	Yes	No
1	Makes few or inconsistent responses to sound		
2	Does not look at visual materials when asked to by someone		
3	Does not startle or react to unexpected or new sounds		
4	Does not respond to caregiver's calling name/not soothed by caregiver's voice		
5	Shows a preference for certain types of sound (high or low frequency, louder or softer sounds)		
6	Has limited vocalizations does not try to imitate		
7	Has difficulty attending to auditory stimuli for a reasonable length of time		
8	Does not turn to or localize voices or sounds		
9	Abnormalities in voice, intonation, articulation		
10	Pulls on or covers ears		
11	Breathes through mouth		
12	Angles head to one side so as to favor one ear		

1.6.4-2-STEP-B Reviewing Medical and Educational Records

In reviewing a student's records you should be looking main sources of information about the medical. The information about the medical records is B.1Congenital factors
B.2 Acquired factors.

Congenital factors	Acquired factors
<ul style="list-style-type: none"> ● Heredity ● Viral infection during pregnancy, e.g. rubella infection ● Congenital defects such as anomalies of the ear, nose or throat 	<ul style="list-style-type: none"> ● Excessive earwax ● Eardrum perforation ● Middle ear effusion or infection ● Otosclerosis or ear ossicle dislocation ● Sequelae of childhood diseases such as

<ul style="list-style-type: none"> ● Pre mature birth, birth asphyxia, excessive bilirubin etc 	<ul style="list-style-type: none"> measles and meningitis ● Head or ear trauma ● Prolonged exposure to loud noise ● Medication that may lead to hearing damage
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Now the details discuss about the congenital factors and acquired factors. Congenital means born with the hearing loss and acquired means hearing loss means could hear when he or she was born but developed hearing loss later in life. Acquired hearing loss also can be described by the age at which it starts. If hearing loss starts before the age when children usually begin talking, it is called “p/-e-lingual”, which means “before speaking”. If hearing loss starts after the age when children begin talking; it is called *post* lingual which means after speaking. So congenital factors and acquired factors depend upon some criteria these are:

- 1) **Hereditary Syndromes and disorders(Syndrome/Condition)**
- 2) Prenatal History(History of maternal infection/exposure during pregnancy)
- 3) Natal History(Prematurity)
- 4) Post Natal History(Prematurity)
- 5) “Red” Flag Terms(Medical Terms associated with Hearing Loss)

1) **Hereditary Syndromes and disorders(Syndrone/Condition)**

		YES	NO
1	CHARGE Syndrome/Association		
2	Down Syndrome		
3	Trisomy 13		
4	Usher Syndrome		
5	Alstrom Syndrome		
6	Goldenhar, Hurler, Norrie, Waardenburg Syndromes		
7	Other genetic syndromes or defects		

2) Prenatal History(History of maternui infection/exposure during pregnancy)

1	Rubella	Yes	NO
2	CMV (cytomegalovirus)		
3	Toxoplasmosis		
4	Herpes		
5	Syphilis		
6	Prenatal infant exposure to drugs or alcohol		
7	Cleft Lip or Palate		

3) Natal History(Prematurity)

1	Birth weight < than 1500 grams (3.3lbs)	YES	NO
2	Prematurity		
3	Preterm birth, exposed to oxygen		
4	On ventilator longer than 5 days		
5	Elevated bilirubin requiring transfusion		
6	Low Apgar scores (1-4 at 1 minute or 0-6 at 5 minutes)		

4) Post Natal History(Prematurity)

1	Meningitis or encephalitis	YES	NO
2	Hydrocephalus/hydrocephaly		
3	Cerebral palsy or other neurological disorders		
4	Brain disorders, brain tumours or malformations of the brain.		
5	Loss of oxygen to the brain		
6	Severe head trauma		
7	Prolonged fever		
8	Child received "mycin" or other known ototoxic medications		

5) “Red” Flag Terms (Medical Terms associated with Hearing Loss)

1	Anoxia, asphyxia, hypoxia	YES	NO
2	Atresia		
3	Cerebral hemorrhage		
4	Cerebral palsy		
5	Ischemia		
6	Meningitis		
7	Peri ventricular damage		
8	Fetal Alcohol Syndrome		

1.6.4-3-STEP-C: Interviewing the Family

Families who have children with hearing impairment usually accurate reports of their child’s use of hearing. They have more opportunities to see their child as well as a more diverse set of circumstances in which to see them. They also have the history of their child over the years in which to observe change. Interviewing parents with a set of discrete and open-ended questions will give a much broader view of the child and help to identify any issues with hearing. A checklist about questions to ask parents about their child’s hearing. These questions are best asked face to face but, if not possible, then a telephone interview will suffice. These questions should not be treated as a form to send home as the impersonal nature of this approach will not yield useful information.

SL NO	QUESTIONS TO ASK THE FAMILY ABOUT THEIR CHILD’S HEARING	Comments/Observations
1	What have <i>you</i> been told by medical professionals (such as the paediatrician or family care physician) about your child’s hearing?	
2	Has your child had ear infections, if so how often?	
3	Is your child frequently congested? Do they have frequent colds?	
4	What is your impression of your child’s hearing?	
5	What sounds get your child’s attention?	

6	What does \ our child do when you call their name?	
7	How does your child react to sudden loud noises? (telephone, car, vacuum)	
8	What kinds of things do you think your child sees, and in what activities does he/she use their vision?	
9	Does your child seem to respond differently when the television or radio is on?	
10	Does your child appear to enjoy toys with sound/ noise?	
11	Does your child enjoy you talking or singing to them?	
12	What words does your child seem to understand?	
Additional Comments:		

I.6.4-4-STEP-D: Meeting with the family

If through the first three steps of the identification process it becomes likely that your student may have a hearing impairment a meeting with the family should be requested to discuss the results of your observations and investigation. There is no cut and dry threshold of determination but if both the educational team and the parent have suspicions, and the student’s behaviour and medical history support this, then a referral to the appropriate medical professional should be made. The meeting to review this tool should include a discussion of your findings and thoughts as well as helping the parents find medical professionals they can access to have their child tested and. if appropriate, diagnosed. For students suspected of having a hearing loss, a referral to an Audiologist is in order below given the checklist

SL NO	QUESTIONS TO ASK THE FAMILY ABOUT THEIR CHILD’S HEARING	Comments/Observations
1	What kinds of hearing tests were conducted?	
2	What did the test results measure and what were the results?	
3	How did the tests go? How did my child react? How confident are you in the results (reliability)?	

4	When should my child be retested?	
5	What do the results mean for my child's ability to discriminate sounds and understand speech?	
6	Would my child benefit from amplification (hearing aids, FM unit, etc.)?	
7	What would be the best way to get more information my child's hearing and what are my next steps?	
8	Is my child's hearing equivalent in both ears? Is there a "better ear" that will assist him/her in accessing speech or environmental sounds better?	
9	Do you suspect that my child has a progressive loss? Will his hearing be worse in the future?	
10	Is it possible for us to listen to the sounds that my child hears?	
11	If my child gets hearing aids what type is recommended? Why is that style better for him/her than others?	
12	With hearing aids, when will he/she need to get new molds?	
13	Is my child a candidate for a cochlear implant? Why or why not?	
14	When should my child be retested?	
15	How does the information from the test results help my child's educational team?	
Additional Comments:		

1.6.5-5- STEP-E: Referral for Medical Follow - Up

Medical appointments are not always an easy experience for parents and helping them to prepare for the appointment will make it more productive for them and ultimately for the educational team, as there is a better chance of getting information that is useful in diagnosing and serving the child. Giving the parents questions to ask the doctor can

be extremely helpful in preparing the parents and questions for audiologists. These, as well as specific questions the parents or team have, should be formulated beforehand so the parent has them on hand for the medical appointment.

1.6.6-G-S i EP-F: Follow-Up Meeting to Discuss Medical Findings

After the child has gone to their medical appointment for hearing a follow-up meeting should be scheduled to assist the parents in understanding the results. If hearing impairment has been identified the next step is to make a referral for an evaluation by a teacher of the deaf. These individuals will evaluate the child and make a recommendation for services that will be put on the IEP with appropriate goals and accommodations.

1.5 Referral Based on Signs and Symptoms of Hearing Loss

Hearing impairment is the inability of an individual to hear sounds adequately. This may be due to improper development, damage or disease to any part of the hearing mechanism. Since deafness is an invisible impairment, often signs and symptoms of hearing loss might help in diagnosis and adequate referral. The various professionals working as a team in management of hearing loss is as follows:

Roles and Responsibilities of Audiologists

Audiologists play a central role in the identification, assessment, diagnosis, and re/habilitation of patients with permanent/sudden hearing loss. Professional roles and activities in audiology include clinical/education services, prevention and advocacy, and education, administration, and research.

Appropriate roles for audiologists include:

- providing prevention information, promoting hearing wellness, and monitoring the acoustic environment;
- educating other professionals on the needs of children with permanent childhood hearing loss and the role of audiologists in diagnosing and managing permanent childhood hearing loss;
- identifying permanent childhood hearing loss, including early detection and screening program development, management, quality assessment, and service coordination;
- conducting a comprehensive assessment, using behavioral, electroacoustic and/or electrophysiologic methods to assess hearing, auditory function, balance, and related systems;
- referring the patient to other professionals as needed to facilitate access to comprehensive services

SPEECH LANGUAGE PATHOLOGIST

The *speech-language pathologist (SLP)* is defined as the professional who engages in professional practice in the areas of communication and swallowing across the life span. Speech-language pathologists (SLPs) play a role in the screening, assessment,

and re/habilitation of children with permanent childhood hearing loss. Professional roles and activities in speech-language pathology include clinical/educational services, prevention and advocacy, education, administration, and research.

OTOLARYNGOLOGIST

Medical specialist who deals with diagnosis and treatment of diseases of the ear, larynx, and upper respiratory tract are called Otolaryngologist. Individuals with history of sudden hearing loss, ear pain or other medical conditions are treated with medicine and surgical intervention. Individuals with profound sensorineural hearing loss and restricted gain from hearing aids might undertake cochlear implantation.

ROLES AND RESPONSIBILITIES OF PSYCHOLOGIST

A psychologist and psychiatrist, helps to address some of the potential psychological effects of hearing loss. They help to rule out any intellectual deficits associated with or without hearing loss. Hearing loss can induce observable psychological effects at various points in development. The potential psychological effects of hearing loss are different for children and adults, which leads to difficult inter and intra personal conflicts leading to psychosomatic disorders. Hence proper guidance and counseling is often pertinent.

SPECIAL EDUCATORS

Rehabilitation council of India aims to promote and facilitate full and equal enjoyment of rights of children who have hearing impairment. The special educators specializing in HEARING Impairment helps to develop knowledge, skills and desirable attitudes to facilitate the differently abled children to blossom to their fullest by providing a barrier free environment. The national goal of Universalization of Elementary Education (UEE) and Education for All (SARVA Shikshya Abhayan) is designed for contributing towards achievement of Millennium Development Goals (MDG) by way of preparing the teacher trainees to meet the challenges of all round development of these children.

VOCATIONAL GUIDANCE AND COUNSELLING

Career guidance for persons with disabilities is an important step in habilitating the persons with disability. The trained and educated social worker professionals identify the potentials of the individuals. With comprehensive assessments and understanding of the persons abilities they help them to pursue their chosen occupational opportunities.

Signs and Symptoms Of Hearing Loss	Other associated symptoms	Severity	Referrals
<ul style="list-style-type: none"> Distinguishing soft/distant speech Responding to subtle cues in conversation Rapid-paced information/transitions Distinguishing grammatical markers (possessive, plural, verb tense/forms, etc.) Fatigues more easily; protests with immature behavior 	Dizziness, ear pain, ear, blockage, ear sensation, discharge (watery, pusulent, blood, foul smelling), abnormal sensation of sound.	Minimal or Slight Hearing Loss (15-25 dB HL)	AUDILOGIST/OTOLARYNGOLOGIST
<ul style="list-style-type: none"> Compared to peers with normal hearing-often greater risk for academic failure Localizing source of sound and filtering speech in noise Distinguishing and understanding speech in classroom environment (even when presented in the "good ear") Distractible/less attentive and easily frustrated Not as confident and more dependent on others as compared to peers with normal hearing 	Dizziness, ear pain, ear, blockage, ear sensation, discharge (watery, pusulent, blood, foul smelling), abnormal sensation of sound.	Unilateral Hearing Loss	AUDILOGIST/OTOLARYNGOLOGIST/ SPEECH LANGUAGE PATHOLOGIST
<ul style="list-style-type: none"> Can possibly miss 25-40% of speech input without aid of audiologic management Cannot "overhear" others' conversations therefore misses positive learning opportunities 25-40 dB HL: can miss 50% of classroom discussion Cannot hear soft/distant voices and described as "daydreaming" or "not trying" Fatigues more easily due to 	Dizziness, ear pain, ear, blockage, ear sensation, discharge (watery, pusulent, blood, foul smelling), abnormal sensation of sound.	Mild Hearing Loss (25-40 dB HL)	AUDILOGIST/ SPEECH LANGUAGE PATHOLOGIST/OTOLARYNGOLOGIST/ SPECIAL EDUCATORS

<ul style="list-style-type: none"> • effort taken to hear • Unmanaged hearing loss can result in lagging behind at least 1 grade level 			
<ul style="list-style-type: none"> • 50-75% of information missed in classroom situations • Articulation and syntax deficits as well as limited receptive and expressive vocabulary • Demonstrates immature behavior • Deficits in communication and social skills • If untreated by 4th grade these students are at least 2 grades below level 	<p>Dizziness, ear pain, ear blockage, ear sensation, discharge (watery, pusulent, blood, foul smelling) abnormal sensation of sound.</p>	<p>Moderate Hearing Loss (40-55 dB HL)</p>	<p>AUDIOLOGIST/ SPEECH LANGUAGE PATHOLOGIST PSYCHOLOGIST/ EDUCATIONAL GUIDANCE AND COUNSELLING/ VOCATIONAL, GUIDANCE STATE GOVERNMENT HOSPITAL FOR DISABILITY CERTIFICATE,</p>
<ul style="list-style-type: none"> • Unamplified-100% of classroom information is missed, cannot direct sound, cannot localize sound, cannot distinguish between environmental and speech sounds • Academic deficits • Language delays (including syntax deficits) • Poor speech intelligibility • Deficits in social skills 	<p>Dizziness, ear pain, ear blockage, ear sensation, discharge (watery, pusulent, blood, foul smelling) abnormal sensation of sound.</p>	<p>Moderately-Severe Hearing Loss (55-70 dB HL)</p>	<p>AUDIOLOGIST/ SPEECH LANGUAGE PATHOLOGIST PSYCHOLOGIST/ EDUCATIONAL GUIDANCE AND COUNSELLING/ VOCATIONAL, GUIDANCE STATE GOVERNMENT HOSPITAL FOR DISABILITY CERTIFICATE,</p>
<ul style="list-style-type: none"> • PTA audiotapes can detect speech and environmental sounds • Requires technology to hear conversational speech • Significant academic, language and social skills deficits • Appears reticent or looks to peers often to model what child should be doing • Requires auditory language intervention to learn to communicate with others 	<p>Dizziness, ear pain, ear blockage, ear sensation, discharge (watery, pusulent, blood, foul smelling) abnormal sensation</p>	<p>Severe Hearing Loss (70-90 dB HL)</p>	<p>AUDIOLOGIST/ SPEECH LANGUAGE PATHOLOGIST PSYCHOLOGIST/ EDUCATIONAL GUIDANCE AND COUNSELLING/ VOCATIONAL, GUIDANCE STATE GOVERNMENT</p>

	of sound.		HOSPITAL FOR DISABILITY CERTIFICATE,
<ul style="list-style-type: none"> • Cannot direct speech vs. environmental sounds without amplification • Verbal expression will not develop without the use of technology • Without use of technology or alternative modes of communication, child will not use a functional communication system to successfully communicate, primitive gestures will remain as primary mode of communication and learning will not occur 	H/O Dizziness, Ear pain, ear blockage, ear sensation, discharge (watery, purulent, blood, foul smelling) abnormal sensation of sound.	Profound Hearing Loss (90+ dB HL)	AUDIOLOGIST/SF EECH LANGUAGE PATHOLOGIST PSYCHOLOGIST/E DUCATIONAL GUIDANCE AND COUNSELLING/ VOCATIONAL; GUIDANCE STATE GOVERNMENT HOSPITAL FOR DISABILITY CERTIFICATE, SIGN LANGUAGE.
<ul style="list-style-type: none"> • Sudden inability to hear. • Selective inattention, refusal to go to school • Emotional and behavioral disorders 	None	Functional hearing loss	AUDIOLOGIST, PSYCHOLOGIST

Partly adapted from: Cole, Elizabeth, and Carol Flevar. *Classroom Accommodations for Students with Hearing Impairment*. San Diego, CA: Plural Publishing, Inc., 2007.