B.ED. SPL. EDUCATION

INTRODUCTION TO SENSORY DISABILITIES

SECD- 02

MADHYA PRADESH BHOJ (OPEN) UNIVERSITY

INTRODUCTION TO SENSORY DISABILITIES

B.Ed. Spl. Ed

(SECD 02)

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Bachelor of Special Education

B.Ed. Spl. Ed.

A Collaborative Programme of

Madhya Pradesh Bhoj (Open) University
&

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HEARING IMPAIRMENT: NATURE & CLASSIFICATION

BLOCK – 1 : INTRODUCTION TO SENSORY DISABILITIES

UNIT – 1 : TYPES OF SENSORY IMPAIRMENTS: SINGLE (HEARING IMPAIRMENT & VISUAL IMPAIRMENT) & DUAL SENSORY IMPAIRMENT (DEAF-BLINDNESS)

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

The term sensory impairment encompasses visual loss (including blindness and partial sight), hearing loss (including the whole range) and multisensory impairment (which means having a diagnosed visual and hearing impairment with at least a mild loss in each modality or deafblindness).

Vision impairment (VI)

This term covers varying degrees of vision loss including those who are registered severely sight impaired (blind). Even the latter may have some vision, such as being able to tell the difference between light and dark. There are many conditions that cause different kinds of vision loss, the main distinction between conditions is whether the impairment is ocular (eye) or cerebral (brain). Cerebral VI (also known as cortical VI) is common in children with CLDD/PMLD. Functional vision refers to the interaction between the environment and how the visual information is processed. Knowing a student's condition and degree of functional vision may help staff to understand what they can see.

Hearing loss is considered to be the most prevalent congenital abnormality in newborns and is more than twice as prevalent as other conditions that are screened for at birth, such as sickle cell disease, hypothyroidism, phynilketonuria, and galactosaemia (Finitzo & Crumley, 1999). It is one of the most common sensory disorders and is the consequence of sensorineural and/or conductive malfunctions of the ear. The impairment may occur during or shortly after birth (congenital or early onset or may be late onset) caused post natal by genetically factors, trauma or disease. Hearing loss may be pre-lingual (i.e., occurring prior to speech and language acquisition) or post-lingual (i.e., occurring after the acquisition of speech and language).

Since hearing loss in infants is silent and hidden, great emphasis is placed on the importance of early detection, reliable diagnosis, and timely intervention (Spivak et al., 2000). Even children who have mild or unilateral permanent hearing loss may experience difficulties with speech understanding, especially in a noisy environment, as well as problems with educational and psycho-social development (Bess et al., 1988; Culbertson & Gilbert 1996). Children with hearing loss frequently experience speech-language deficits and exhibit lower academic achievement and poorer social-emotional development than their peers with normal hearing.

The period from birth to 3-5 years is often considered as the "critical period" for the development of normal speech and language. Normal hearing in the first six months of life is also considered critical for normal speech and language skills. Hence, early identification and appropriate intervention within the first six months of life have been demonstrated to prevent or reduce many of the adverse consequences and to facilitate language acquisition (Yowhinaga-Itano et al., 1998).

Consequently, in developed countries with a high standard of health care, primary services include the early detection of congenital hearing loss and the initiation of auditory habilitation before six months of age.
The prevalence of congenital and early-onset hearing loss in most developed countries is estimated to range between 2-4 infants with moderate-severe hearing loss in every 1000 births. In contrast, only limited information is available on developing regions, including the Middle East especially in the Arab countries, where the prevalence is estimated to be markedly higher than in Israel or European and North American countries (Attias et al., 2006). In developing countries, more than 10 infants in every 1000 births are estimated to be affected by a severe profound hearing loss. Of the 62 million deaf children younger than 15 years old worldwide, two-thirds reside in developing countries (Smith, 2003).
Presbycusis (age-related hearing loss) is the loss of hearing that gradually occurs in most individuals as they grow older. Hearing loss is a common disorder associated with aging and is ranked as the third most prevalent chronic condition in elderly people after hypertension and arthritis. Its prevalence and severity increase with age, rising from about 30-35 percent of adults aged 65 and older to an estimated 40-50 percent of adults aged 75 and older (Cruikshanks et al., 1998). The loss associated with presbycusis is usually greater for high-pitched sounds. For example, it may be difficult for someone to hear the nearby chirping of a bird or the ringing of a telephone, and it is most difficult to understand speech in a noisy background. However, the same person may be able to clearly hear the low-pitched sound of a truck rumbling down the street. Presbycusis most often occurs in both ears, affecting them equally. Because the process of loss is gradual, people who have presbycusis may not realize that their hearing is diminishing.
Schuknecht (1974) has described four types of human presbycusis:

1. sensory, mainly affecting the cochlear hair cells and supporting cells
2. neural, typified by the loss of afferent neurons in the cochlea
3. metabolic, where the lateral wall and stria vascularis of the cochlea atrophy; and

4. mechanical, where there seemed to be a so-called "stiffening" of the basilar membrane and organ of Corti

There are many causes of presbycusis, though it is most commonly the result of changes in the inner ear as a person ages. It can also stem from changes in the middle ear or from complex changes along the nerve pathways leading to the brain.
The negative impact of hearing loss on older adults is significant (LaForge et al., 1992). Hearing loss is associated with depression, social isolation, poor self-esteem, and functional disability (Mulrow et al., 1990a), particularly for those suffering from hearing impairment who have not yet been evaluated or treated for hearing loss.

Hearing impairment is a broad term that refers to hearing losses of varying degrees, ranging from hard-of-hearing to total deafness. As the general population continues to age, the prevalence of hearing impairment can be expected to increase. Since the use of hearing aids or surgical intervention to improve hearing loss has been shown to have a positive impact on quality of life (Mulrow et al., 1990b, 1992; Weinstein, 1991), more screening programs for elderly adults should be established, followed by appropriate referral to audiologists based on individual needs. Without early diagnosis and treatment of hearing impairment, quality of life and functional status are likely to decline in the aging population.
The major challenge facing people with hearing impairment is communication. Hearing-impaired persons vary widely in their communication skills. Among the conditions that affect the development of communication skills by persons with hearing impairments are personality, intelligence, nature and degree of deafness, degree and type of residual hearing, degree of benefit derived from amplification by hearing aid, family environment, and age of onset. Age of onset plays a crucial role in the development of language. Persons with pre-lingual hearing loss (present at birth or occurring before the acquisition of language and the development of speech patterns) are more functionally disabled than those who lose some degree of hearing after the acquisition of language and speech.

When describing hearing impairment, three attributes are considered:

1. Type of hearing loss (part of the hearing mechanism that is affected).
2. Degree of hearing loss (range and volume of sounds that are not heard).
3. Configuration (range of pitches or frequencies at which the loss has occurred).

Types of hearing loss

A hearing loss can be classified as a conductive, sensory, neural, or mixed hearing loss, based on the anatomic location of the problem (site of lesion, i.e., middle or inner ear). A hearing loss may also be labeled as unilateral or bilateral, depending on whether the loss is in one (unilateral) or both (bilateral) ears. The degree of loss might be the same in both ears (symmetrical hearing loss) or it could be different for each ear (asymmetrical hearing loss).

Conductive hearing loss is characterized by an obstruction to air conduction that prevents the proper transmission of sound waves through the external auditory canal and/or the middle ear. It is marked by an almost equal loss of all frequencies. The auricle (pinna), external acoustic canal, tympanic membrane, or bones of the middle ear may be dysfunctional. Conductive hearing loss may be congenital or caused by trauma, severe otitis media, otosclerosis, neoplasms, or atresia of the ear canal. Some conductive hearing loss can be treated surgically with tympanoplasty or stapedectomy, and the use of hearing aids and assistive listening devices may also be beneficial.

Sensorineural hearing loss occurs when the sensory receptors of the inner ear are dysfunctional. Sensorineural deafness is a lack of sound perception caused by a defect in the cochlea and/or the auditory division of the vestibulocochlear nerve. This type of hearing loss is more common than conductive hearing loss and is typically irreversible. It tends to be unevenly distributed, with greater loss at higher frequencies. Sensorineural hearing loss may result from congenital malformation of the inner ear, intense noise, trauma, viral infections, ototoxic drugs (e.g., cisplatin, salicylates, loop diuretics), fractures of the temporal bone, meningitis, ménière's disease, cochlear otosclerosis, aging (i.e., presbycusis), or genetic predisposition, either alone or in combination with environmental factors. Many patients with sensorineural hearing loss can be habilitated or rehabilitated with the use of hearing aids. Patients with profound bilateral sensorineural hearing loss (e.g., at least 90 dB) who derive no benefit from conventional hearing aids may be appropriate candidates for the cochlear implant device, which bypasses the damaged structures of the cochlea and stimulates the function of the auditory nerve. Auditory brainstem implants, which are similar to multichannel cochlear implants, are used in patients with neurofibromatosis type 2 following vestibular schwannoma removal, especially those individuals who have lost integrity of the auditory nerves.

Auditory Neuropathy (AN) is a type of sensorineural hearing loss that can be congenital or acquired. Unlike other types of sensorineural hearing loss where both Otoacoustic Emissions (OAE) and Auditory Brainstem Response (ABR) tests are likely to be abnormal, Auditory Neuropathy is characterized by normal OAE results and significantly abnormalABR responses, even when measured with very loud sounds. The combination of normalOAE responses and severely impaired ABR responses is thought to reflect normal outer hair cell (OHC) function in the cochlea and abnormal auditory nerve function. The site of lesion for AN is often unknown, but possibilities include cochlear inner hair cells, cochlear spiral ganglia, synapse and/or eighth nerve fiber disorders. Audiograms of children with ANvary from hearing in the normal range with complaints of difficulty hearing in background noise to profound hearing loss.

Individuals with **mixed hearing loss** have both conductive and sensory dysfunction. Mixed hearing loss is due to disorders that can affect the middle and inner ear simultaneously, such as otosclerosis involving the ossicles and the cochlea, head trauma, middle ear tumors, and some inner ear malformations. Trauma resulting in temporal bone fractures may be associated with conductive, sensorineural, and mixed hearing loss.

Auditory Processing Disorder (APD) is a deficit in neural processing of auditory stimuli that is not due to higher order language, cognitive, or related factors. However, APD may lead to or be associated with difficulties in higher order language, learning, and communication functions. This type of auditory problem affects more complex auditory processes, such as understanding speech when there is background noise. The results of hearing sensitivity and physiological tests, such as otoacoustic emissions (OAE) and auditory brainstem response (ABR) are normal in children with a central auditory disorder.

A great many, including what exactly constitutes an APD, with some professionals being still unconvinced that it exists as a separate clinical entity, poor understanding of the boundaries and overlap between APD and language or other developmental disorders, and lack of uniform accepted guidelines regarding testing and management of APD.

Degree of hearing loss

- **Deaf/Deafness** refers to a person who has a profound hearing loss and uses sign language.
- **Hard of hearing** refers to a person with a hearing loss who relies on residual hearing to communicate through speaking and lip-reading.
- **Hearing impaired** is a general term used to describe any deviation from normal hearing, whether permanent or fluctuating, and ranging from mild hearing loss to profound deafness.
- **Residual hearing** refers to the hearing that remains after a person has experienced a hearing loss. It is suggested that greater the hearing loss, the lesser the residual hearing.

OBJECTIVES

After studying this unit you should be able to

- Define the term 'impairment', 'disability' and 'handicap'.
- Understand the conceptual differences between the terms
- Provide suitable examples to describe each term

DIFINATIONS

The two main types of hearing loss are:

Conductive hearing loss, which is the most common type and results from interference in the conduction pathways through which sound reaches the inner ear. This hearing loss usually affects the volume of sound reaching the inner ear. People with conductive hearing loss may benefit from the surgical insertion of grommets or from hearing aids. It is commonly a temporary hearing loss.Sensorineural hearing loss, which is caused by damage to the hair cells lining the inner ear, or the nerves that supply them. This hearing loss can range from mild to profound, and affects certain frequencies more than others. Consequently, people with sensorineural hearing loss need high quality hearing aids or cochlear implants to gain access to the spoken word and sound in the environment.
The term sensory impairment encompasses visual loss (including blindness and partial sight), hearing loss (including the whole range) and multisensory impairment (which means having a diagnosed visual and hearing impairment with at least a mild loss in each modality or deafblindness).

Vision impairment (VI)

This term covers varying degrees of vision loss including those who are registered severely sight impaired (blind). Even the latter may have some vision, such as being able to tell the difference between light and dark. There are many conditions that cause different kinds of vision loss, the main distinction between conditions is whether the impairment is ocular (eye) or cerebral (brain). Cerebral VI (also known as cortical VI) is common in children with CLDD/PMLD. Functional vision refers to the interaction between the environment and how the visual information is processed. Knowing a student's condition and degree of functional vision may help staff to understand what they can see.

Hearing impairment (HI)

The two main types of hearing loss are:

This is a general overview of the implications of vision impairment, hearing impairment and multi-sensory impairment. The impact of impairments for individual students with complex learning difficulties and disabilities would need to be analysed in depth.

Multisensory impairment (MSI)

This is a term used to describe students who have a combination of visual and hearing loss. They are sometimes referred to as deafblind, although many have some residual sight and/or hearing. The combination of the two sensory losses intensifies the impact of each. Students with multisensory impairment have much greater difficulty in accessing the environment and the curriculum, than those with a single sensory impairment.

What is sensory impairment?

It is also possible to have a mixed hearing loss, which arises from both the above.

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SUMMARY

It is important to consider factors relating to students' vision condition in order to meet their individualneeds. These include: type of condition or visual impairment; age of onset; degree of functional vision;type of intervention provided.Students with VI and additional learning needs may:

- be delayed in all areas of development, including cognitive, physical, emotional and neurological
- struggle in their attainment of key developmental milestones such as acquiring communication
- and social skills, attaining orientation, mobility and life skills and understanding abstract ideas and concepts
- have delayed social use of language due to lack of concept understanding, for example.

Again, it is important to know: the type of deafness; age of onset; level of useful hearing; means of communication (signing, speech or both); type of intervention, including whether wearing a hearing aid or a cochlear implant. The development of communication is a key issue. These students may:of sensory impairment

- be delayed in the development of both receptive and expressive communication skills
- experience difficulty in learning various aspects of verbal communication, including vocabulary,
- grammar and word order
- need to communicate through a combination of oral (including speech and speechreading) andmanual (including sign language and fingerspelling) methods, depending on the degree and type of deafness and a range of other factors,display developmental, psychological and emotional problems.

MSI

The combination of the two sensory losses, which intensifies the impact of each, makes for much
greater difficulties in accessing the environment and the curriculum, than those with a single sensory
impairment. Particular difficulties lie in:

- communication and the development of relationships
- mobility and interaction with the physical environment
- processing and integration of information from residual hearing, vision and other senses
- perception of time and space transference and generalisation of skills and concepts development of abstract reasoning.

CHECK YOUR PROGRESS

A) Fill in the Blanks

1. Inability to perform functional activities is called ____________________.

2. ________________________ is denoted by anomalies on organ, tissues, or functioning of body systems.
3. Limitations is fulfilling one's age appropriate socio-cultural role is known as ______________.
4. Where as __________________ situation specific, ______________________ is an aspect of life.

B) Match each of the disabilities with ensuing handicaps

Disability	**Handicap**
a) Loss of sight	i) Mobility
b) loss of hearing	ii) employment
c) loss of arms	iii) schooling
d) loss of legs	iv) communication
e) mental deficiency	v) self care

A) Fill in the Blanks

1. Disability
2. Impairment
3. Handicap
4. Handicap, disability

B) Match

A - I

B - iv

C - v

D - ii

E - iii

ASSIGNMENT/ACTIVITY

Define the term 'Sensory Impairment' and 'hearing impairment ' and provide live examples of two such children from your locality to describe each term.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Ashman, A & Elkins, J. (Eds) (1994) Educating children with special needs, Prentice Hall, New York.
2. Hallahan, D.P. & Kauffman, J.M. (1991) Exceptional children: Introduction to special education, Allyn & Bacon, Boston.

UNIT – 2 : IMPORTANCE OF HEARING

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Hearing empowers us and enriches our lives. Hearing enables us to socialise, work, interact, communicate and even relax. Good hearing also helps to keep us safe, warning us of potential danger or alerting us to someone else's distress.

Hearing is essential for us to be able to live and participate in life more fully. Problems with our hearing may lead to feelings of isolation and even depression. Our hearing provides us with an enormous source of information, some of it obvious and some we barely notice but when combined, this information forms the bridge between the world and how we interact with it.

Hearing helps us lead our everyday lives without limitations.

Everyday situations that can be affected by hearing loss

Hearing is important...

"Sensory disabilities" can involve any of the five senses, but for educational purposes, it generally refers to a disability related to hearing, vision, or both hearing and vision.

Sensory disabilities affect access – access to visual and/or auditory information. Most content information is presented visually and/or auditorily in the classroom. It is important that children experiencing a vision and/or a hearing loss are appropriately identified to ensure access to education.

Deaf – Blind

The Regulations Governing Special Education Programs for Children with Disabilities in Virginia (effective July 7, 2009) defines the term as follows:

"Deaf-Blindness" means hearing and visual impairments occurring at the same time, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for children with deafness or children with blindness. 34 CFR § 300.7 (c) (3); 8VAC20-81-10.

Hearing Impairment – Deafness

The Regulations Governing Special Education Programs for Children with Disabilities in Virginia (effective July 7, 2009) defines the term as follows:

"Hearing Impairment" means an impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance but that is not included under the definition of deafness in this section. 34 CFR § 300.7 (c) (5) .

"Deafness" means a hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, that adversely affects the child's educational performance. 34 CFR § 300.7 (c) (3).

Visual Impairment – Blindness

The Regulations Governing Special Education Programs for Children with Disabilities in Virginia (effective July 7, 2009) defines the term as follows:

"Visual impairment including blindness" means an impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness. (34 CFR §300.8(c) (13).

Speech, language and hearing

Speech, language and hearing are an important part of your child's life. The speech is described as the ability to make sounds, while language goes beyond this and refers to the ability to understand and use these sounds. Hearing is necessary for the proper development of both speech and language.

Language is a basic tool for interpersonal relationships, is an act of communication that allows people to exchange ideas and emotions. It is closely linked to intelligence and thought, and to reach language that we must be able to imagine and remember, have the symbol of things without them being present. Therefore, it is considered one of the most important human conditions, since it allows the man to evolve. For this reason, speaking in a clear and understandable is a fundamental requirement for life, the failure to have this opportunity to communicate with peers can limit many aspects of daily life. It is essential to realize the importance of oral language as a tool used par excellence for human beings to communicate with their peers.

When the family is going through a stimulating and educational environment by promoting a child's language development. All children need some degree of stimulation, this stems the importance of play in addition an auditory stimulation in learning the whole language.

It is important to emphasize that the hearing is more responsible for learning reading and writing that vision. While reading requires good visual ability is acquired normally, a child born blind can learn to read and write, a fact accomplished through Braille. This is thanks to these children, having a good hearing, had no trouble developing their oral language, which is the basis for acquiring the system consisting of reading and writing. Therefore we must not forget that reading is thinking and writing is thinking in writing. In addition, good auditory discrimination leads to a correct reading comprehension.

Auditory training is vital and must be started with the discovery and analysis of "natural sounds", which in an organized and planned to drive the child to the assessment of the various sound qualities (level pre-musical).

Most children hear and listen from birth, they learn to talk by imitating the sounds that are around, the voices of their loved ones, and that our language is a language of sounds, composed of sounds such as consonants and vowels. This leads to the correction of oral language is intimately linked to an adequate auditory perception, which actually has an essential role in the development of language, since the ear depends on the acoustic communication with the outside. Therefore, considering the oral language as the active element and passive listening as to achieve a correct articulation of phonemes correct is crucial hearing.
Some strategies for proper auditory stimulation

In the early years:
Moving musical toys, invite the child to search the sound source and connect the noise with movement. Speak from different places, whispering in her ear, singing nursery rhymes. Putting music varied, changing the tone of voice. Return books with great illustrations, names the objects as they are shown.

From 2-4 years:
Describe the actions taken by the protagonist of a story, fill bottles with different materials, to appreciate the differences sound a glass jar.

From 4-6 years:
Reading stories and to ask simple questions. Identify sounds produced by the body (clapping, jumping, etc.). Name objects according to a given feature, for example: "Tell me something that is blue?"

From 6 to 7 years:
Follow orders on paper, sorting objects that go together; to sequences of numbers, letters or words and the child repeat them. Memorize poems,

tongue twisters, riddles.

Other exercises that will enrich the listening area

1. Repeat songs or poems that rhyme, for example, "Sawdust, sawing the timbers of San Juan ..."
2. Inventing words that rhyme: "How many words can you find that rhyme with the word cat?"

3. Talking about the first sounds of familiar words. Ask the child: "What sound you hear at the beginning of your name?" "Do you know any other word that starts with the same sound?"
4. Design a family book. Have a picture of all family members and find pictures of objects that begin with the same letter of his name.

At the slightest suspicion that the child does not listen properly consult a specialist in the field.

OBJECTIVES

After studying this unit you should be able to

- Define the terms classification and labelling
- Discuss the advantages and disadvantages of classification and labelling
- List the various types of disabilities
- Describe the features of subgroups within each disability

DEFINITIONS

Hearing is important...

... at work

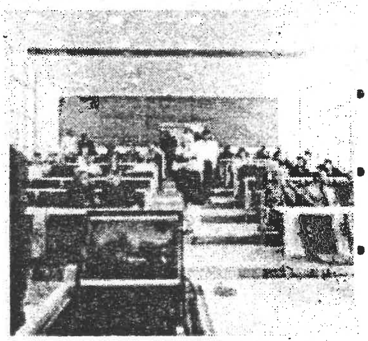
- Participating in group meetings.
- Talking on the telephone.
- Following a conversation in a busy office.

... at social occasions

- Chatting to friends.
- Participating in dinner conversation at a restaurant.
- Interacting with grandchildren.
- Talking on the telephone.
- Watching TV together with others.

... for our own safety

- When walking near busy roads.
- To be able to hear sounds that alert us to danger like sirens and other traffic signals.
- So we can be alert to a cry for help.



... when we learn

- Allowing us to maintain a high level of concentration with little effort.
- So we are able to communicate with instructors.
- So we are able to register information accurately.

SUMMARY

The ear, despite its small size, is a highly complex organ. Acting as sound filter, the ear transforms every sound audible to us into accurate information the brain can prioritise.

Each ear consists of delicate and highly complex mechanisms. In "the inner" ear, a sea of tiny sensory cells and nerve fibres pick up sound vibrations and transform them into electrical impulses for the brain to process.

If the ear is exposed to strong vibrations over time, the sensory cells and fibres can become damaged, if these are unable to heal or be replaced, this can lead to permanent hearing loss.

Anatomy

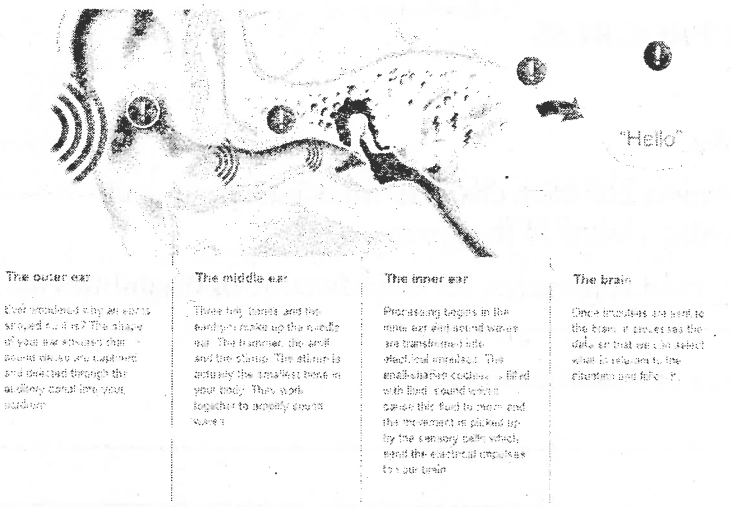
The ear is made up of three parts:

- the outer ear (the external ear and the ear canal)
- the middle ear (the ear drum and three very small bones)
- the inner ear (the cochlea and auditory nerve)

Sound travels through the air in waves resulting in a series of vibrations within the ear. The brain then interprets those signals into meaningful sounds such as speech.

Our ears are small

BUT HIGHLY COMPLEX AMPLIFIERS


"Hello"
The outer ear
The middle ear
The inner ear
The brain

CHECK YOUR PROGRESS

I Fill in the blanks

1. ----------- organises common characteristics into group and ----------- provides a name to the group
2. The commonly used approaches for classification of disabilities are ----------and ----------------.
3. Two advantages of classification are :

----

4. A partially sighted person is also known as a person with -------------------------
5. Blind children should be educated through ----------------- and other --------------

   ---------------- aids.
6. We can measure hearing sensitivity is ----------------------.
7. Hearing impairment can be classified into ----------------and -------------------.
8. AAMR stands for ---
9. In order to classified as mentally retarded an individual's IQ should be ------------ or ------------.
10. Orthopeadic disabilities are termed as ------------------------------in the PWD Act.
11. Cerebral Palsy is a ------------------------- disorder.

12.Learning Disabilities is caused by the dysfunction of the --------------
----

13.-------------------- , ---------------- and ------------------- are three categories of learning disabilities.

14.Two characteristics of Attention Deficit Disorder are --------------- &

15.----------------, ---------------- and ------------------ are the major features of Attention Deficit/Hyperactivity Disorder.

II Match the following :

(a)	Visual Impairment	(i)	Petit mal
(b)	Hearing Impairment	(ii)	Academic difficulties
(c)	Mental Retardation	(iii)	Thalidomide
(d)	Cerebral Palsy horn cells	(iv)	Damage to anterior
(e)	Epilepsy behaviour	(v)	Deficits in adaptive
(f)	Poliomyelitis	(vii)	Problem
(g)	Teratogen linguistic information	(viii)	Problems in processing
(h)	Learning disabilities	(viiii)	Spasticity

I Fill in the blanks

1. Classification, label
2. Categorical, non-categorical
3. Any two of the following :
   - Helps in naming & differentiating between disabilities
   - Essential for research
   - Promotes formation of support groups
   - Helps development of treatments & therapies
4. Low vision
5. Braille, tactile / auditory
6. Decibels
7. Deaf, hard of hearing
8. American Association on Mental Retardation
9. 70, below
10. locomotor disability
11. non.progressive
12. Central nervous system
13. Dyslexia, dysgraphia, dyscalculia
14. Any two of the following :
    - Over activity
    - Restlessness
    - Impulsivity
    - Aggressiveness

- Unpredictability

15. Inattention, hyperactivity, impulsivity

A	--	(vi)	E	--	(i)
B	--	(vii)	F	--	(iv)
C	--	(v)	G	--	(iii)
D	--	(viii)	H	--	(ii)

ASSIGNMENT?ACTIVITY

1. Select any one kind of disability and study 5 such disabled children. Subdivide in to subgroups on the basis of features observed.

POINTS FOR DISCUSSION / CLARIFICATION

After going through the unit you may like to discuss or seek clarification on some points if so, please mention the points below :

Points for Discussion

Points for Clarification

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FURTHER READINGS

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UNIT – 3 : PROCESS OF HEARING & ITS IMPEDIMENT LEADING TO DIFFERENT TYPES OF HEARING LOSS

STRUCTURE

INTRODUCTION

Prevalence of a condition or disability in determined by epidemiology.

Conductive Hearing Loss

Conductive hearing loss is caused by any condition or disease that impedes the conveyance of sound in its mechanical form through the middle ear cavity to the inner ear. A conductive hearing loss can be the result of a blockage in the external ear canal or can be caused by any disorder that unfavorably effects the middle ear's ability to transmit the mechanical energy to the stapes footplate. This results in reduction of one of the physical attributes of sound called intensity (loudness), so the energy reaching the inner ear is lower or less intense than that in the original stimulus. Therefore, more energy is needed for the individual with a conductive hearing loss to hear sound, but once it's loud enough and the mechanical impediment is overcome, that ear works in a normal way. Generally, the cause of conductive hearing loss can be identified and treated resulting in a complete or partial improvement in hearing. Following the completion of medical treatment for cause of the

conductive hearing loss, hearing aids are effective in correcting the remaining hearing loss.
The audiometric profile that indicates a conductive hearing loss is the presence of air-bone gaps (better hearing by bone conduction than by air conduction), excellent word recognition at a comfortable listening level, and evidence of a middle ear dysfunction on immittance. For situations where a blockage is noted in the external ear canal, hearing testing is deferred until the canal is cleared.

Sensorineural Hearing Loss

The second type of hearing loss is called sensorineural hearing loss. This word can be divided into its two components - sensory and neural - to allow us more clarity in specifying the type of hearing loss. The comprehensive audiometric assessment and supplemental tests can yield the information needed to differentiate between a sensory and a neural hearing loss, although they can co-exist in the same ear. Neural hearing loss is another name for retrocochlear hearing loss.
Sensorineural hearing loss results from inner ear or auditory nerve dysfunction. The sensory component may be from damage to the organ of Corti or an inability of the hair cells to stimulate the nerves of hearing or a metabolic problem in the fluids of the inner ear. The neural or retrocochlear component can be the result of severe damage to the organ of Corti that causes the nerves of hearing to degenerate or it can be an inability of the hearing nerves themselves to convey neurochemical information through the central auditory pathways.
The reason for sensorineural hearing loss sometimes cannot be determined, it does not typically respond favorably to medical treatment, and it is typically described as an irreversible, permanent condition. Like conductive hearing loss, sensorineural hearing loss reduces the intensity of sound, but it might also introduce an element of distortion into what is heard resulting in sounds being unclear even when they are loud enough. Once any medically treatable conditions have been ruled out, the treatment for sensorineural hearing loss is amplification through hearing aids.

Mixed Hearing Loss

A mixed hearing loss can be thought of as a sensorineural hearing loss with a conductive component overlaying all or part of the audiometric range tested. So, in addition to some irreversible hearing loss caused by an inner ear or auditory nerve disorder, there is also a dysfunction of the middle ear mechanism that makes the hearing worse than the sensorineural loss alone. The conductive component may be amenable to medical treatment and reversal of the associated hearing loss, but the sensorineural component will most likely be permanent. Hearing aids can be beneficial for persons with a mixed hearing loss, but caution must be exercised by the hearing care professional and patient if the conductive component is due to an active ear infection

The **Hearing Process**. In the course of **hearing**, sound waves enter the auditory canal and strike the eardrum, causing it to vibrate. The sound waves are concentrated by passing from a relatively large area (the eardrum) through the ossicles to a relatively small opening leading to the inner ear.

In the course of hearing, sound waves enter the auditory canal and strike the eardrum, causing it to vibrate. The sound waves are concentrated by passing from a relatively large area (the eardrum) through the ossicles to a relatively small opening leading to the inner ear. Here the stirrup vibrates, setting in motion the fluid of the cochlea. The alternating changes of pressure agitate the basilar membrane on which the organ of Corti rests, moving the hair cells. This movement stimulates the sensory hair cells to send impulses along the auditory nerve to the brain.

It is not known how the brain distinguishes high-pitched from low-pitched sounds. One theory proposes that the sensation of pitch is dependent on which area of the basilar membrane is made to vibrate. How the brain distinguishes between loud and soft sounds is also not understood, though some scientists believe that loudness is determined by the intensity of vibration of the basilar membrane.

In a small portion of normal hearing, sound waves are transmitted directly to the inner ear by causing the bones of the skull to vibrate, i.e., the auditory canal and the middle ear are bypassed. This kind of hearing, called bone conduction, is utilized in compensating for certain kinds of deafness (see deafness; hearing aid), and plays a role in the hearing of extremely loud sounds.

Hearing loss can be caused by many different causes, some of which can be successfully treated with medicine or surgery, depending on the disease process.

Three Types of Hearing Loss

- Conductive hearing loss - when hearing loss is due to problems with the ear canal, ear drum, or middle ear and its little bones (the malleus, incus, and stapes).
- Sensorineural hearing loss (SNHL) - when hearing loss is due to problems of the inner ear, also known as nerve-related hearing loss.
- Mixed hearing loss - refers to a combination of conductive and sensorineural hearing loss. This means that there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve.

Conductive Hearing Loss

Causes:

- Malformation of outer ear, ear canal, or middle ear structures
- Fluid in the middle ear from colds
- Ear infection (otitis media - an infection of the middle ear in which an accumulation of fluid may interfere with the movement of the eardrum and ossicles
- Allergies
- Poor Eustachian tube function
- Perforated eardrum
- Benign tumors
- Impacted earwax
- Infection in the ear canal
- Foreign body in the ear
- Otosclerosis

Treatments of Conductive Hearing Loss:

Types of **conductive hearing loss** include congenital absence of ear canal or failure of the ear canal to be open at birth, congenital absence, malformation, or dysfunction of the middle ear structures, all of which may possibly be surgically corrected. If these are not amenable to successful surgical correction, then the hearing alternatively may be improved with amplification with a bone conduction hearing aid, or a surgically implanted, osseointegrated device (for example, the Baha or Ponto System), or a conventional hearing aid, depending on the status of the hearing nerve.

Other causes of **conductive hearing loss** are: infection; tumors; middle ear fluid from infection or Eustachian tube dysfunction; foreign body; and trauma (as in a skull fracture). Acute infections are usually treated with antibiotic or antifungal medications. Chronic ear infections, chronic middle fluid, and tumors usually require surgery. If there is no response to initial medical therapy, infectious middle ear fluid is usually treated with antibiotics -- while chronic non-infectious middle ear fluid is treated with surgery (or pressure equalizing tubes).

Conductive hearing loss from head trauma is frequently amenable to surgical repair of the damaged middle ear structures, performed after the patient's general medical status is stabilized following acute traumatic injuries.

A genetic form of **conductive hearing loss** is **otosclerosis**, in which there is bony fixation of the stapes (the third little bone of hearing in the middle ear), where sound can't get to the middle ear. Otosclerosis usually presents with hearing loss in early adulthood. Otosclerosis can successfully be managed with surgery to replace the immobile stapes with a mobile stapes prosthesis or with a hearing aid. Research suggests that the measles virus may contribute to stapes fixation in those with a genetic predisposition to otosclerosis. The incidence of otosclerosis may be decreasing in some communities due to measles vaccination. Otosclerosis (a hereditary disorder in which a bony growth forms around a small bone in the middle ear, preventing it from vibrating when stimulated by sound) usually causes a conductive hearing loss, a hearing loss caused by a problem in the outer or middle ear. Less frequently, otosclerosis may cause a sensorineural hearing loss (damaged sensory cells and/or nerve fibers of the inner ear), as well as a conductive hearing loss.

Sensorineural Hearing Loss

Causes:

- Exposure to loud noise
- Head trauma
- Virus or disease
- Autoimmune inner ear disease
- Hearing loss that runs in the family
- Aging (presbycusis)
- Malformation of the inner ear
- Meniere's Disease
- Otosclerosis - a hereditary disorder in which a bony growth forms around a small bone in the middle ear, preventing it from vibrating when stimulated by sound.
- Tumors

Treatment of Sensorineural Hearing Loss:

- **Sensorineural hearing loss** can result from acoustic trauma (or exposure to excessively loud noise), which may respond to medical therapy with corticosteroids to reduce cochlea hair cell swelling and inflammation to improve healing of these injured inner ear structures.
- **Sensorineural hearing loss** can occur from head trauma or abrupt changes in air pressure such as in airplane descent, which can cause inner ear fluid compartment rupture or leakage, which can be toxic to the inner ear. There has been variable success with emergency surgery when this happens.
- **Sudden sensorineural hearing loss**, presumed to be of viral origin, is an otologic emergency that is medically treated with corticosteroids.
- **Bilateral progressive hearing loss** over several months, also diagnosed as autoimmune inner ear disease, is managed medically with long-term corticosteroids and sometimes with drug therapy. Autoimmune inner ear disease is when the body's immune system misdirects its defenses against the inner ear structures to cause damage in this part of the body.

- **Fluctuating sensorineural hearing loss** may be from unknown cause or associated withMeniere's Disease. Symptoms of Meniere's disease are hearing loss, tinnitus (or ringing in the ears), and vertigo. Meniere's disease may be treated medically with a low-sodium diet, diuretics, and corticosteroids. If the vertigo is not medically controlled, then various surgical procedures are used to eliminate the vertigo.
- **Sensorineural hearing loss from tumors** of the balance nerve adjacent to the hearing nerve, generally are not reversed with surgical removal or irradiation of these benign tumors. If the hearing loss is mild and the tumors are very small, hearing may be saved in 50 percent of those undergoing hearing preservation surgery for tumor removal.
- **Sensorineural hearing loss from disease** in the central nervous system may respond to medical management for the specific disease affecting the nervous system. For example, hearing loss secondary to multiple sclerosis may be reversed with treatment for multiple sclerosis.
- **Irreversible sensorineural hearing loss**, the most common form of hearing loss, may be managed with hearing aids. When hearing aids are not enough, this type of hearing loss can be surgically treated with cochlear implants.

Mixed Hearing Loss

Treatments for Mixed Hearing Loss

Audiologist Mark Ross, Ph.D., recommends taking care of the conductive component first. There have been times when the addition of the conductive component made the person a better hearing aid candidate, by flattening out the audiogram for example, while the underlying sensorineural component presented a high-frequency loss. However, still the emphasis would be on treating medically what can be treated. He says that, generally, you would expect positive results.

OBJECTIVES

At the end of this unit you should be able to

- Define the term 'incidence' and 'prevalence' and explain the difference between them
- Describe the factors that influence prevalence of disabilities.
- Provide an estimate of prevalence of various disabilities at national and international levels.

DEFINITIONS

Many people are aware that their hearing has deteriorated but are reluctant to seek help. Perhaps they don't want to acknowledge the problem, are embarrassed by what they see as a weakness, or believe that they can "get by" without using a hearing aid. And, unfortunately, too many wait years, even decades, to address the effects of hearing loss before getting treatment.

But time and again, research demonstrates the considerable effects of hearing loss on development as well as negative social, psychological, cognitive and health effects of untreated hearing loss . Each can have far-reaching implications that go well beyond hearing alone. In fact, those who have difficulty hearing can experience such distorted and incomplete communication that it seriously impacts their professional and personal lives, at times leading to isolation and withdrawal.

Studies have linked untreated hearing loss effects to:

- irritability, negativism and anger
- fatigue, tension, stress and depression
- avoidance or withdrawal from social situations
- social rejection and loneliness
- reduced alertness and increased risk to personal safety
- impaired memory and ability to learn new tasks
- reduced job performance and earning power
- diminished psychological and overall health

Hearing loss is not just an ailment of old age. It can strike at any time and any age, even childhood. For the young, even a mild or moderate case of hearing loss could bring difficulty learning, developing speech and building the important interpersonal skills necessary to foster self-esteem and succeed in school and life.

At the Better Hearing Institute, our mission is to help educate the public about hearing loss and promote the importance of prevention and treatment. On this website, you will find basic information about hearing loss, including advances in diagnosis and treatment, a review of different hearing aids, and resources for medical care and financial assistance.
If you think you or a loved one suffers from hearing loss, don't delay another day. Visit a hearing healthcare professional and take the first step toward a world of better hearing.

SUMMARY

The Hearing System

The anatomy of the hearing system can be divided into four components for our convenience in remembering the parts and associating these parts with their function. These divisions are the:

1. outer ear
2. middle ear
3. inner ear
4. central auditory pathways

The Outer Ear (1)

Several structures comprise the outer ear. The most readily seen is the pinna, also called the auricle. The pinna is made up of a frame of cartilage that is covered with skin. The pinna has obvious folds, elevations, depressions and a prominent bowl - all of which vary somewhat from person to person but a basic pattern in these features is fairly universal among all people. The pinna acts as a funnel to collect and direct sound down the ear canal. It also serves to enhance some sounds through its resonance characteristics. Finally, it helps us to appreciate front-back sound localization.
The other structure of the outer ear is the external ear canal. The outer two-thirds of this canal has a cartilaginous framework, and the inner one-third is bony. The skin of the external ear canal is continuous with the skin of the pinna. The ear canal is curved, almost "S" shaped and averages about 1 inch in length in adults. The skin of ear canal has hairs (more prominent in some people) and glands that produce wax called cerumen (also more prominent in some individuals than in others). This

hair and cerumen serve a protective function for the ear canal. In addition, cerumen helps to lubricate the skin and keep it moist.

The Middle Ear (2)

The middle ear begins at the inner end of the external auditory canal, specifically at the eardrum. Also called the tympanic membrane, the eardrum is a thin and delicate membrane stretched across the entire inner end of the ear canal separating the environment from the middle ear. Despite the delicacy of its structure, the tympanic membrane never stops working to transform fluctuations in air pressure known as sound into exact copies in the mechanical domain as vibrations.

On that inner side of the tympanic membrane is an air-filled space called the middle ear cavity. It contains the bones of hearing, two muscles, a number of ligaments, a small branch of the nerve of taste, and the opening of the Eustachian tube. The vibratory motions of the tympanic membrane are transmitted to the bones of hearing, also known as the ossicles or the ossicular chain. This ossicular chain articulates with the tympanic membrane through the lateral most bone called the malleus (hammer). The malleus then sends the mechanical vibrations to the incus (anvil), which in turn communicates with the inner most ossicle called the stapes (stirrup). These are the three smallest bones in the body, and, like the tympanic membrane, they never stop moving because they are constantly bombarded with sound, even while we're sleeping! Functionally, the tympanic membrane converts the acoustical energy of sound into an exact copy in the mechanical domain. The ossicles then convey this mechanical energy to the inner ear at the oval window where the footplate of the stapes sits. It is at this location where the mechanical energy is then transformed into the hydraulic energy that the inner ear processes.

The ossicles are suspended from the roof of the middle ear cavity by tiny ligaments, and the malleus is connected to the tympanic membrane by a ligament, as well. In addition, there are two muscles located in the middle ear space. One is called the stapedius. It is attached to the stapes and contracts when very loud sounds are detected.

The opening for the Eustachian tube is located at the front wall of the middle ear cavity, and the other end opens in the upper, back part of the throat. The Eustachian tube is a muscular tunnel that opens and closes to provide fresh air to and drain debris from the middle ear space and to equalize the pressure between the environment and the middle ear space. It's what we try to "pop" when we're in an airplane, or an elevator, or in the mountains. Its functions are very important to maintaining the health of the middle ear space.

The Inner Ear (3)

The inner ear has two divisions: one for hearing, the other for balance. The division for hearing consists of the cochlea and the nerve of hearing. The cochlea is snail-shaped, bony structure that contains three fluid-filled compartments that run the cochlea's entire length. One compartment is sandwiched between the other two, and it contains the sensory organ for hearing called the organ of Corti. The organ of Corti responds when the hydraulic energy of the cochlear fluid activates its tiny hair cells to release chemical messengers. These messengers then stimulate the nerves of hearing which carry sound stimuli to the brain. The pitch and loudness of the original acoustic signal in the ear canal determine the exact location and the number of hair cells activated on the organ of Corti.

The balance mechanism is also called the vestibular system. It too is made up of a series of fluid-filled compartments (three semi-circular canals and two larger divisions) that contain the sense organs for balance and movement. The vestibular sensors detect angular movements, direction and velocity of the head. This information about equilibrium is sent to the brain by the vestibular nerves, a functionally separate division of the auditory vestibular nerve, the VIIIth cranial nerve.

Central Auditory Pathways (4)

"Inner ear" is a collective term that encompasses the separate structures for hearing and balance. Once the auditory vestibular nerve reaches the brainstem, the balance system sends its information to brain structures responsible for processing this type of sensory information, whereas the hearing system sends its information to different parts of the brain specifically to extract the sound cues out of the electrical message brought by the nerves of hearing.

We can think of the central auditory pathways as being organized like circuits. There are short and long segments, all of which work together as the central auditory pathways or the central auditory nervous system.

This system begins as the nerve of hearing enters the brainstem. From here, the neural pathway makes its way up to the cerebral cortex at the temporal lobe of the brain along the way switching back and forth from each side of the brainstem with neurons multiplying in number at each relay station along the circuit. Right ear information is directed to the left temporal lobe, and left ear information goes to the right temporal lobe. In addition, there is a transfer of information from one side of the brain to the other. In most people, the left side of the brain processes speech and other complex language functions, whereas tonal stimuli and music are deciphered by the right side of the brain.

THE PROCESS OF "HEARING"

Our ears work to transform the acoustic stimulus that travels down our ear canals into the type of neural code that our brains can recognize, process and understand. It all starts at the tympanic membrane where the physical attributes of the sound are transformed into a mechanical stimulus. This mechanical code is transmitted through the ossicular chain to the stapes footplate where the code is again transformed this time into hydraulic energy for transmission through the fluid-filled cochlea. Finally, when the cochlea's hair cells are stimulated by the fluid waves a neurochemical event takes place which excites the nerves of hearing. The physical characteristics of the original acoustic signal are preserved at every energy change along the way until this code becomes one that the central auditory pathways can direct to the temporal lobe of the brain for recognition and processing.

The brain and the relay stations along the central auditory pathways can extract not only the pitch and loudness features but also as other critical attributes such as temporal features (timing) and different cues from each ear. Features of the sound stimulus can be extracted, enhanced, and modulated and this information can be compared separately from each ear or combined into a single perception. These features can be compared to other acoustic patterns that are stored in the brain, perhaps for the recognition of the voice of a family member or friend, or they can be the initial experience with a new sound or a new voice.

Our hearing systems anchor us to the soundscape of our environment with an incredible ability to detect and differentiate infinitesimally small acoustic cues. Our brains store the neural equivalents of acoustic patterns - voices, music, environmental sounds, danger signals - that make it easier to process and recognize both familiar and unfamiliar signals. Hearing loss misleads our brain with a loss of audibility (sounds are softer, not as loud) as well as a distortion of the information that reaches the brain. Changes in the effectiveness of the brain to process stimuli, through head trauma, neurologic disease or disorder, or the naturally occurring process of aging, can result in symptoms that mimic hearing loss - inattention, inappropriate responses, confusion, a disconnect from the those around us, for example. The ears and the brain combine in a truly remarkable way to process neural events into the sense of hearing and all that it encompasses. Perhaps it's fair to say that we "hear" with our brain, not with our ears!

REVISION/CHECK YOUR PROGRESS

I. Fill in the Blanks:

(i) Epidemiological science is used to determine the ______________ of a condition.

(ii) Number of new cases in a population at a specified period of time is called _______ ______________ of that condition.

(iii) Total number of cases of a condition in a population a specified period of time would be known as its ______________________________.

(iv) The factors that contribute to the prevalence rate of disabilities are ______________.

(v) Nearly 10 million Indians suffer from ________________________.

(vi) India: Human Development Report (1999) found an alarmingly high number of cases of _____________________________ in West Bengal.

(vii) Almost _____________________ people out of 1000 are estimated to be mentally retarded.

(viii) In India the most commonly found physical disability is that caused by __________________.

(ix) Prevalence rate of learning disabilities in recent years has risen to ______________ percent in the USA.

(x) Studies have found that between 4 % and 8.1 % of school going children are affected by ________________ & ________________.

II. Match the following:

III.

i) Mental retardation	a) 18 lakhs
ii) Rett's syndrome	b) Physical disability
iii) HIV virus	c) Age
iv) Cancer	d) Sex
v) Cerebral palsy	e) 15 laks

Check your progress

I. Fill in the blanks

i) Prevalence

ii) Incidence

iii) Prevalence

iv) Age, sex, social class & race

v) Visual impairment

vi) Hearing impairment

vii) 30

viii) Poliomyelitis

ix) 47

x) ADD & ADHD

II. Match the following:

i) (c)

ii) (d)

iii) (a)

iv) (e)

v) (b)

ASSIGNMENT/ACTIVITY

1. Estimate the prevalence of various disabilities present in your village/Locality.

POINTS FOR DISCUSSION / CLARIFICATION

After going through the unit you may like to discuss or seek clarification on some points if so, please mention the points below :

Points for discussion

Points for clarification

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UNIT – 4 : DEFINITION OF HEARING LOSS, DEMOGRAPHICS & ASSOCIATED TERMINOLOGIES: DEAF/ DEAF/ DEAFNESS/ HEARING IMPAIRED/ DISABILITY/ HANDICAPPED

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Information on hearing and deafness including common auditory system conditions and sign language communication

Hearing Loss Definition

Hearing loss, deafness, hard of hearing, anacusis, or hearing impairment, is a partial or total inability to hear. In children it may affect the development of language and can cause work related difficulties for adults. Hearing loss is caused by many factors, including: genetics, age, exposure to noise, illness, chemicals and physical trauma.

Deaf Culture: Describes the social beliefs, behaviors, art, literary traditions, history, values, and shared institutions of communities that are affected by deafness and which use sign languages as the main means of communication. When used as a cultural label especially within the culture, the word deaf is often written with a capital D and referred to as "big D Deaf" in speech and sign. When used as a label for the audiological condition, it is written with a lower case d.

OBJECTIVES

At the end this chapter you, as a student, will, -

1) develop knowledge about the various disabling conditions that affect children.
2) will be able to label him correctly, based on the observations made regarding the child's behaviours
3) develop an indepth knowledge of the condition its causes and related condition.

DIFINATIONS

Hearing is one of the traditional five senses. It is the ability to perceive sound by detecting vibrations via an organ such as the ear. The inability to hear is called deafness. A hearing impairment or hearing loss is a full or partial decrease in the ability to detect or understand sounds. Caused by a wide range of biological and environmental factors, loss of hearing can happen to any organism that perceives sound.

Hearing loss can also be classified based on which portions of the hearing system (auditory system) are affected. When the nervous system is affected, it is referred to as sensorineural hearing loss. When the portions of the ear that are responsible for transmitting the sound to the nerves are affected, it is referred to as conductive hearing loss.

A sensorineural hearing loss is due to insensitivity of the inner ear, the cochlea, or to impairment of function in the auditory nervous system. It can be mild, moderate, severe, or profound, to the point of total deafness. This is classified as a disability under the ADA and if unable to work is eligible for disability payments.

There are two main types of hearing loss.

- One happens when your inner ear or auditory nerve is damaged. This type is permanent.
- The other kind happens when sound waves cannot reach your inner ear due to ear wax build up, fluid or a punctured eardrum.

Hearing loss is categorized by its severity and by the age of onset.

Two persons with the same severity of hearing loss will experience it quite differently if it occurs early or late in life. Furthermore, a loss can occur on only one side (unilateral) or on both (bilateral).

Hearing impairment may be ranked as mild, moderate, moderately severe, severe or profound:

- **Mild:** for adults: between 26 and 40 dB HL
  for children: between 20 and 40 dB HL
- **Moderate:** between 41 and 54 dB HL
- **Moderately severe:** between 55 and 70 dB HL
- **Severe:** between 71 and 90 dB HL
- **Profound:** 91 dB HL or greater
- **Totally Deaf:** Have no hearing at all.

Hearing loss can be inherited.

Both dominant gene and recessive genes exist which can cause mild to profound impairment. If a family has a dominant gene for deafness it will persist across generations because it will manifest itself in the offspring even if it is inherited from only one parent. It is estimated around half of all deafness and hearing impairment can be prevented.

People who are severely deaf rely a lot on lip-reading, even with a hearing aid.

Profoundly deaf people can also use sign language to communicate. Hearing impaired persons with partial loss of hearing may find that the quality of their hearing varies from day to day, or from one situation to another or not at all. They may also, to a greater or lesser extent, depend on both hearing-aids and lip-reading.

Any form of communication between people is a two way street. It is very important then to determine how a deaf person prefers to communicate. There are a number of options available to them such as sign language, lip reading or using text. There will be a way of making a connection. It may sometimes be difficult or awkward but the effort is well worth it.

The commonest cause of hearing loss is aging, and three-quarters of people who are deaf are aged over 60. At around 20 years of age, our hearing starts a gradual decline. Higher frequencies are usually the first to go. This age-related hearing loss is normal and doesn't lead to total loss of hearing. Age-related hearing loss (presbycusis) typically begins

with the loss of higher frequencies, so that certain speech sounds - such as 's', 'f' and 't' - end up sounding very similar. This means the older person can hear, but not always understand.
Many people who are deaf consider spoken language their primary language and consider themselves "hard of hearing". How one classifies themselves relative to hearing loss or deafness is a very personal decision and reflects much more than just their ability to hear.

Hearing loss is any degree of impairment of the ability to apprehend sou nd.

Sound can be measured accurately. The term decibel (dB) refers to an a mount of energy moving sound from its sourceto our ears or to a microp hone. A drop of more than 10 dB in the level of sound a person can hear is significant.
Sound travels through a medium like air or water as waves of compressi on and rarefaction. These waves are collectedby the external ear and cau se the tympanic membrane (ear drum) to vibrate. The chain of ossicles c onnected to the eardrum—the incus, malleus, and stapes—
carries the vibration to the oval window, increasing its amplitude 20 time s on theway. There the energy causes a standing wave in the watery liqui d (endolymph) inside the Organ of Corti. (A standingwave is one that do es not move. A vibrating cup of coffee will demonstrate standing waves.) The configuration of thestanding wave is determined by the frequency of the sound. Many thousands of tiny nerve fibers detect the highs andlo ws of the standing wave and transmit their findings to the brain, which in terprets the signals as sound.
To summarize, sound energy passes through the air of the external ear, t he bones of the middle ear and the liquid of theinner ear. It is then transl ated into nerve impulses, sent to the brain through nerves and understood there as sound. Itfollows that there are five steps in the hearing process:

- air conduction through the external ear to the ear drum
- bone conduction through the middle ear to the inner ear
- water conduction to the Organ of Corti
- nerve conduction into the brain

- interpretation by the brain.

The external ear canal can be blocked with ear wax, foreign objects, infe ction, and tumors. Overgrowth of the bone, acondition that occurs when the ear canal has been flushed with cold water repeatedly for years, can a lso narrow thepassageway, making blockage and infection more likely. This condition occurs often in Northern Californian surfers and istherefo re called "surfer's ear."

The ear drum is so thin a physician can see through it into the middle ear . Sharp objects, pressure from an infection inthe middle ear, even a firm cuffing or slapping of the ear, can rupture it. It is also susceptible to pres sure changes duringscuba diving.

Several conditions can diminish the mobility of the ossicles (small bones) in the middle ear. **Otitis media** (an infection inthe middle ear) occurs when fluid cannot escape i nto the throat because of blockage of the eustachian tube. The fluidthat a ccumulates, whether it be pus or just mucus and dampens the motion of t he ossicles. A disease called**otosclerosis** can bind the stapes in the oval window and thereby cause deafness.

All the conditions mentioned so far, those that occur in the external and middle ear, are causes of conductive hearingloss. The second category, s ensory hearing loss, refers to damage to the Organ of Corti and the acous tic nerve.Prolonged exposure to loud noise is the leading cause of sensor y hearing loss. A million people have this condition,many identified duri ng the military draft and rejected as being unfit for duty. The cause is oft en believed to be prolongedexposure to rock music. Occupational noise exposure is the other leading cause of noise induced hearing loss (NIHL) and is ample reason for wearing ear protection on the job. A third of peo ple over 65 have presbycusis—
sensory hearingloss due to **aging**. Both NIHL and presbycusis are primar ily high frequency losses. In most languages, it is the highfrequency sou nds that define speech, so these people hear plenty of noise, they just can not easily make out what itmeans. They have particular trouble selecting out speech from background noise. Brain infections like **meningitis**, dru gssuch as the aminoglycoside **antibiotics** (streptomycin, gentamycin, ka namycin, tobramycin), and Meniere's disease alsocause permanent senso ry hearing loss. Meniere's disease combines attacks of hearing loss with

attacks of vertigo. Thesymptoms may occur together or separately. High doses of salicylates like **aspirin** and quinine can cause a temporaryhigh-frequency loss. Prolonged high doses can lead to permanent deafness. Th ere is an hereditary form of sensorydeafness and a congenital form most often caused by rubella (German **measles**).
Sudden hearing loss—at least 30dB in less than three days—
is most commonly caused by cochleitis, a mysterious viralinfection.
The final category of hearing loss is neural. Damage to the acoustic nerv e and the parts of the brain that perform hearingare the most likely to pro duce permanent hearing loss. Strokes, multiple sclerosis, and acoustic ne uromas are allpossible causes of neural hearing loss.
Hearing can also be diminished by extra sounds generated by the ear, mo st of them from the same kinds of disordersthat cause diminished hearin g. These sounds are referred to as **tinnitus** and can be ringing, blowing, clicking, oranything else that no one but the patient hears.

Diagnosis

An examination of the ears and nose combined with simple hearing tests done in the physician's office can detect manycommon causes of hearing loss. An audiogram often concludes the evaluation, since these simple means often producea diagnosis. If the defect is in the brain or the acoust ic nerve, further neurological testing and imaging will be required.
The audiogram has many uses in diagnosing hearing deficits. The patter n of hearing loss across the audible frequenciesgives clues to the cause. Several alterations in the testing procedure can give additional informati on. For example,speech is perceived differently than pure tones. Adequat e perception of sound combined with inability to recognize wordspoints t o a brain problem rather than a sensory or conductive deficit. Loudness p erception is distorted by disease incertain areas but not in others. Acousti c neuromas often distort the perception of loudness.

Treatment

Conductive hearing loss can almost always be restored to some degree, i f not completely.

- matter in the ear canal can be easily removed with a dramatic impr ovement in hearing.

- surfer's ear gradually regresses if cold water is avoided or a specia l ear plug is used. In advanced cases, surgeonscan grind away the exce ss bone.
- middle ear infection with fluid is also simple to treat. If medicatio ns do not work, surgical drainage of the ear isaccomplished through th e ear drum, which heals completely after treatment.
- traumatically damaged ear drums can be repaired with a tiny skin graft.
- surgical repair of otosclerosis through an operating microscope is one of the most intricate of procedures, substitutingtiny artificial parts for the original ossicles.

Sensory and neural hearing loss, on the other hand, cannot readily be cur ed. Fortunately it is not often complete, so that**hearing aids** can fill the deficit.
In-the-
ear hearing aids can boost the volume of sound by up to 70 dB. (Normal speech is about 60 dB.) Federal law nowrequires that they be dispensed only upon a physician's prescription. For complete conduction hearing lo ss there are nowavailable bone conduction hearing aids and even devices that can be surgically implanted in the cochlea.
Tinnitus can sometimes be relieved by adding white noise (like the soun d of wind or waves crashing on the shore) to theenvironment.
Decreased hearing is such a common problem that there are legions of or ganizations to provide assistance. Speciallanguage training, both in lip re ading and signing, special schools and special camps for children are all available in mostregions of the United States.

There are some demographic statistics available, but they are either outdated or unreliable because some people may not wish to identify themselves as having a hearing loss, or the question forms may not ask directly if a person has a hearing loss. The estimated demographic figure has ranged from 22 million deaf and hard of hearing to as high as 36 million deaf and hard of hearing. Of these, only a few million are considered "deaf" and the remainder are hard of hearing. Further muddying statistics is the fact that some "deaf" people may actually be hard of hearing, and some "hard of hearing" people may actually be

deaf. There are certainly enough of us with hearing losses that companies recognize the potential purchasing power of such a large segment of society.
Statistics are primarily maintained by two Federal agencies: The National Center for Health Statistics (NCHS) which is under the Centers for Disease Control (CDC), and the U.S.

Etiology information is available for approximately one-half of the students reported to the 1992-93 Annual Survey of Hearing Impaired Children and Youth, conducted by the Center for Assessment and Demographic Studies. It is estimated that this survey represents 60-65% of the population of deaf and hard-of-hearing students in the U.S. who receive special education services.

As shown in Table 13, heredity, at 13%, is the leading known cause of hearing impairment at birth, followed by pregnancy/birth complications (including Rh incompatibility, prematurity, and birth trauma) at 8.7%. Meningitis, at 8.1%, is the leading known cause of hearing impairment occurring after birth.

Table 13: Reported Etiology of Hearing Loss by Onset, for the Estimated Population of Deaf and Hard of Hearing Students in the United States, 1992-93 (N=48,300).

Cause of Hearing Loss	**Percent**
Onset at birth:	**(47.4%)**
Maternal rubella	2.1%
Cytomegalovirus	1.3%
Other pregnancy/birth complications (including Rh incompatibility, prematurity, and birth trauma)	8.7%
Heredity	13.0%
Other causes at birth	4.5%
Cause not known/reported	17.8%
Onset after birth:	**(23.2%)**

Cause of Hearing Loss	Percent
Meningitis	8.1%
Otis media	3.7%
Other infection/fever (including measles and mumps)	4.0%
Trauma	0.6%
Other cause after birth	1.5%
Cause not known/reported	5.3%
Onset not known/reported	**(29.4%)**
TOTAL	100.0%

Source: 1992-93 Annual Survey of Hearing Impaired Children and Youth,
Center for Assessment and Demographic Studies, Gallaudet University.

UNIT SUMMARY

Facts: Hearing Loss

- Some medications may reversibly affect hearing. This includes some diuretics, aspirin and NSAIDs, and macrolide antibiotics.
- The term hearing impaired is more likely to be used by people with a less than severe hearing loss and people who have acquired deafness in adulthood rather than by those who have grown up deaf.
- There is a progressive loss of ability to hear high frequencies with increasing age known as presbycusis. For men, this can start as early as 25 and women at 30, but may even affect teenagers and children.
- Hearing loss can be inherited. Around 75-80% of all cases are inherited by recessive genes, 20 to 25% are inherited by dominant genes, 1 to 2% are inherited by X-linked patterns, and fewer than 1% are inherited by mitochondrial inheritance.
- Members of the deaf community tend to view deafness as a difference in human experience rather than a disability. A positive attitude toward being deaf is typical in deaf cultural groups.

Deafness is not generally considered a condition that needs to be fixed.

- Deaf culture is recognized under article 30, paragraph 4 of the United Nations Convention on the Rights of Persons with Disabilities, which states that "Persons with disabilities shall be entitled, on an equal basis with others, to recognition and support of their specific cultural and linguistic identity, including sign languages and deaf culture."

Statistics: Hearing Impairment

Over 37 million adults and over 1 million children in the United States suffer from some degree of hearing loss.

In the U.K. around 840 babies are born with significant deafness each year. About one in 1,000 children is deaf at three years old and about 20,000 children aged up to 15 are moderately to profoundly deaf.

CHECK YOUR PROGRESS

1) What are the early indicators of a possible learning disability, M.R, V.I, H.I.

2) Visit an orthopedic center children's section. Observe the children and categorize them into their orthopedic conditions.

SUGGESTED ASSIGNMENT

1) Observe and describe the motor movements of a child (0-2 yrs, 3-5 yrs, 6-8 yrs, 9-12 yrs.) with spasticity, athetoses, ataxia, muscular dystrophy, MMC, and polio.

POINTS FOR DISCUSSION / CLARIFICATION

After going through the unit you may like to discuss or seek clarification on some points if so, please mention the points below :

Points for discussion

Points for clarification

SUGGESTED READINGS

1. Eugene E Bleck and Donald Physically Handicapped Children.
   Donald A Nagel (1975) A Medical Atlas for Teachers.
   Black Engene E,Grune and Stratton Inc. Nagel Doneld A.

2. Richard A Culatta Fundamentals of Special Education.
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   Bacon-M-02210.

UNIT – 5 : CHALLENGES ARISING DUE TO CONGENITAL AND ACQUIRED HEARING LOSS

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

A child with a congenital hearing loss should begin receiving treatment before 6 months of age. Studies suggest that children treated this early are usually able to develop communication skills (using spoken or sign language) that are as good as those of hearing peers.

In the United States of America, because of a Federal law (the Individuals with Disabilities Education Act), children with a hearing loss between birth and 3 years of age have the right to receive interdisciplinary assessment and early intervention services at little or no cost. After age 3, early intervention and special education programs are provided through the public school system.

There are a number of treatment options available, and parents will need to decide which are most appropriate for their child. They will need to consider the child's age, developmental level and personality, the severity of the hearing loss, as well as their own preferences. Ideally a team of experts including the child's primary care provider, anotolaryngologist, a speech-language pathologist, audiologist and an educator will work closely with the parents to create an Individualized Family Service Plan. Treatment plans can be changed as the child gets older.

Children as young as 4 weeks of age can benefit from a hearing aid. These devices amplify sound, making it possible for many children to hear spoken words and develop language. However, some children with severe to profound hearing loss may not be able to hear enough sound, even with a hearing aid, to make speech audible. A behind-the-ear hearing aid is often recommended for young children because it is safer and more easily fitted and adjusted as the child grows as compared to one that fits within the ear.

Parents also will need to decide how their family and child are going to communicate. If the child is going to communicate orally (speech), s/he may need assistance learning listening skills and lip reading skills to help her/him understand what others are saying. Many children with hearing loss also need speech or language therapy.

A child also can learn to communicate using a form of sign language. In the United States of America, the type preferred by most deaf adults is American Sign Language (ASL), which has rules and grammar that is distinct from English. There are also several variations of sign language that can be used along with spoken English which are standard in English-speaking countries outside the United States.

There is also a visual model of spoken language called cued speech. Learning to lip read is very difficult because many sounds look the same on the lips. Cued speech enables young children with hearing loss to clearly see what is being said, and learn spoken languages with normal grammar and vocabulary. It clarifies lip reading using 8 hand shapes in 4 positions and usually takes less than 20 hours to learn the entire system.

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Surgery may be recommended if a child has a permanent conductive hearing loss caused by malformations of the outer or middle ear, or by repeated ear infections. Although fluid in the middle ear usually results in only temporary hearing loss, chronic ear infection can cause a child to fall behind in language skills. In some cases, a doctor may suggest inserting a tube through the eardrum to allow the middle ear to drain. This procedure generally does not require an overnight hospital stay.

Surgery also may be an option for some children with severe to profound sensorineural hearing loss. A device called a cochlear implant can be surgically inserted in the inner ear of children as young as 12 months of age to stimulate hearing. The surgery requires a hospital stay of one to several days. With additional language and speech therapy, children with cochlear implants may learn to understand speech and speak reasonably well, but the amount of improvement is variable.

Once a child is diagnosed, the immediate and anticipated reaction of the parents and immediate family is one of the denial. Doctors or the audiologists need to counsel the family, help them cope with the situation and encourage them to look forward to solutions to overcome the problem. Often when the family is told about the excellent options available for a hearing impaired child, the chances of acceptance are much better. Once the family accepts the handicap, half the battle is over and rehabilitation can begin.

The type of intervention required depends on several factors. Chief among these is the degree of impairment. When a child has a fair degree of residual hearing, the correct intervention would be fitting "optimised"

hearing aids. "Optimisation" means fitting the child with a hearing aid appropriate to its degree of deafness.
Today a variety of good quality hearing aids are available – analog or digital body worn (for small children) or ear level for older children. When fitting a hearing aid, a competent audiologist has to assess the child's residual hearing, look at the hearing aid's performance and fit the child with an appropriate instrument. Equally important is the ear mould, which has to be custom made to suit the shape of the child's ear.

If a child has profound or total deafness, the benefits of hearing aids are limited. Depending upon the level and type of hearing loss, cochlear implants may be used instead of hearing aids.

The term **congenital hearing loss** means the hearing loss is present at birth. Congenital hearing loss can be caused by genetic or nongenetic factors.

Nongenetic factors can account for about 25% of congenital hearing loss. Nongenetic factors that are known to cause congenital hearing loss include:

- Maternal infections, such as rubella (German measles), cytomegalovirus, or herpes simplex virus
- Prematurity
- Low birth weight
- Birth injuries
- Toxins including drugs and alcohol consumed by the mother during pregnancy
- Complications associated with the Rh factor in the blood/jaundice
- Maternal diabetes
- Toxemia during pregnancy
- Lack of oxygen (anoxia)

Genetic factors (hereditary) are thought to cause more than 50% of all hearing loss. Hearing loss from genetic defects can be present at birth or develop later on in life. Most genetic hearing loss can be described as autosomal recessive or autosomal dominant. Other, more rare types of genetic hearing loss include X-linked (related to the sex chromosome) or mitochondrial inheritance patterns.

In **autosomal recessive hearing loss**, both parents carry the recessive gene and pass it along to the child. Parents are often surprised to discover their child has a hearing loss because they are not aware that they are carrying a defective gene. This type of inheritance pattern accounts for about 70% of all genetic hearing loss.

An **autosomal dominant hearing loss** occurs when an abnormal gene from one parent is able to cause hearing loss even though the matching gene from the other parent is normal. The parent who is carrying the dominant gene may also have hearing loss as well as other signs and symptoms that make up a genetic syndrome. The autosomal dominant pattern accounts for 15% of all genetic hearing loss cases.

Genetic syndromes have a group of signs and symptoms that together indicate a specific disease. There are many genetic syndromes that include hearing loss as one of the symptoms.

Examples include:

- Down syndrome
- Usher syndrome
- Treacher Collins syndrome
- Crouzon syndrome
- Alport syndrome
- Waardenburg syndrome

Acquired hearing loss is a **hearing loss** that appears after birth. The**hearing loss** can occur at any time in one's life, as a result of an illness or injury.

Acquired causes of hearing loss

There are many possible causes of hearing loss in children. Some causes arecongenital (present at birth), while others are acquired (cause of hearing loss happens sometime after birth). Acquired hearing loss is also known as Late Onset Hearing Loss(LOHL).

- Otitis Media (ear infections)
- Collection of fluid in the middle ear

- Perforated ear drum (may be causes by untreated ear infections, head injury, blow to the ear, or from poking something in the ear)
- Blockage in the middle ear (usually caused by a build up of wax)
- Diseases, viruses, infections (including Meningitis, Measles, Mumps, Chicken Pox, Influenza, etc)
- Certain drugs and medications
- Long term exposure to loud noises
- Head trauma

OBJECTIVES

At the end this chapter you, as a student, will, -

- develop knowledge about the various disabling conditions that affect children.
- will be able to label him correctly, based on the observations made regarding the child's behaviours
- develop an indepth knowledge of the condition its causes and related condition.

DIFINATIONS

Abnormalities of the external ear Anotia/microtia

Anotia is the total absence of the auricle, most often with narrowing or absence of the external auditory meatus. Strictly speaking, in microtia, there is some degree of malformation of the external ear (± narrowing or absence of the external auditory meatus) in contrast to a 'small ear' which is normally formed, as seen in Down's syndrome. These conditions may be unilateral or bilateral - the latter is less common.

- Anotia is rare but seen in 20% of children with thalidomide-induced abnormalities. Microtia (along with protruding ears) is the most common ear problem encountered in plastic surgery. It is seen in 0.03% of all newborns. It is commonly associated with hemifacial microsomia.
- Between 6% and 16% of cases are associated with chromosomal abnormalities and up to 65% of cases occur in isolation. However, both can also be associated with first arch syndrome and the oculo-auriculo-vertebral spectrum (of which Goldenhar's

syndrome is the most severe manifestation). Other associations include Treacher Collins' syndrome, Nager and CHARGE syndrome (Coloboma, Heart defects, Atresia of the choanae, Restriction of growth and developmental delay, Genitourinary abnormalities, Ear anomalies), among others.

- External auditory meatus atresia must be ruled out early (within days in bilateral cases and months in unilateral cases), as delayed speech development can ensue.
- Surgical reconstruction of the auricle is usually carried out between 6-7 years of age.[3] The options will involve either a reconstruction using rib cartilage (which requires several procedures, entails chest wall scarring and the ear does not grow with the child) or prosthetic reconstruction, which can achieve very lifelike results. The procedure can be done under local anaesthetic but general anaesthetic is often preferred, particularly if the patient is a child.
- Postsurgical complications can include infection, haematoma and scarring. Psychological complications include disappointment due to unwarranted expectations - this can be obviated by careful counselling pre-operatively.
- The future promises exciting developments, including intrauterine diagnosis and treatment of severe ear deformities, gene therapy and tissue generation, in vitro cartilage growth and the increasing use of prosthetic implants.

Macrotia[2][3]

This is a large but normally formed auricle, not usually associated with functional abnormality. It is defined as an ear which is two or more standard deviations from the mean. True macrotia is rare but may be seen in association with vascular malformations, hemihypertrophy, neurofibromatosis and secondary to haemangioma. It is more conspicuous if the ear is prominent too. Surgical correction can be carried out. The Antia-Buch technique, which involves freeing the helical flap and repositioning it, is the most commonly used procedure.[4]

Preauricular accessory auricles

- These are usually found just anterior to the tragus and range from simple skin tags to complex structures containing cartilage.
- They are present in up to 1.5% of the population and, in isolation, usually present with no functional abnormality.
- They can be part of a syndrome (eg, Treacher Collins' syndrome or Goldenhar's syndrome).
- Simple lesions can be easily removed but, when they are more complex (eg, cartilage is involved), surgery is more tricky as all the cartilage needs to be removed and the superficially placed underlying facial nerve can be put at risk.

UNIT SUMMARY

External auditory meatus atresia[5][6]

Congenital atresia of the external auditory canal is caused by a failure of canalisation of the epithelial plug portion of the first branchial cleft. This results in the formation of a membranous or bony (or both) plate at the level of the tympanic membrane. There may be associated ossicular malformations. The stenosis may be for part or all of its length.

- Stenosis usually does not result in hearing loss if patency is maintained but atresia does.
- It is a rare condition (of the order of 1-5:200,000 live births) and is more common in boys. There is a positive family history in 14% of cases. Unilateral atresia is 3 to 6 times more likely to occur than bilateral atresia.
- External auditory meatus atresia is often associated with other abnormalities.[7]
- Complications may include recurrent otitis media, cholesteatoma and mastoiditis.
- Management is often multidisciplinary: ear, nose and throat (ENT) surgeons will work alongside audiologists, plastic surgeons, paediatricians and geneticists.

An audiological assessment is carried out in the first instance to rule out hearing impairment in the infant. If it is unilateral, this should take place in the first few months of life but, if it is bilateral, within the first few days.[8]

Unilateral cases usually manage well, although may have some trouble in localising exact direction of sound. Problems arise if there is repeated otitis media or impacted cerumen in the normal ear.
In cases with bilateral abnormalities, bone conduction hearing aids are the first line of treatment (± followed by bone-anchored hearing aids). This is eventually followed by surgery (after the age of 5 or 6 years), after CT assessment of the extent of the problem and regular audiological monitoring. Surgery is always carried out after any correction of the auricle, as the unscarred skin is essential to the surgeon in fashioning a new auricle.

Abnormalities of the middle ear[9]
In the absence of other problems, hearing loss associated with these abnormalities is often picked up during the course of routine infant and childhood audiological assessments. More specialist assessment and management is carried out in the ENT department.

Tympanic membrane abnormalities

The tympanic membrane may be small (eg, congenital rubella syndrome), distorted (eg, VATER syndrome (Vertebral anomalies, Anal atresia, Tracheo-oesophageal fistula, (o)Esophageal atresia and Renal anomalies and radial dysplasia)) or replaced by fibrous tissue or a bony plate.

Ossicular abnormalities

- There are a number of different ossicular abnormalities, which may affect one or more of the ossicles.
- There may be absence of part or all of these bones and there can also be varying degrees of fusion.
- The associated intratympanic muscles are often affected and there can be an aberrant course of the facial nerve.
- Surgery can go some way towards correcting this.

Abnormalities of the tympanic cavity

Congenital cholesteatoma (2-3% of all cholesteatomas)
It is usually unilateral, may be bilateral, and presents as conductive hearing loss. The tympanic membrane is intact and overlies a white mass (this varies from a small pearl size to filling the entire middle ear) which

can act as a source of infection. CT scanning to assess the lesion is advisable as this will dictate the surgical approach.[10]

Vascular abnormalities

These include the presence in the middle-ear cavity of internal carotid artery aneurysms, jugular bulb abnormalities and very rare cases of an anomalous internal carotid artery. These vascular abnormalities tend to present with limited functional problems but a pulsatile red, smooth mass may be seen behind the tympanic membrane on examination. Their presence should be confirmed in a specialist unit, as it will have implications in considering any future intervention in the ear or to these structures.

Congenital perilymph fistula

This may occur, linking the perilymphatic space of the inner ear to the middle-ear cavity. There are often associated deformities. Children present with fluctuating and progressive sensorineural hearing loss ± tinnitus, vertigo and, occasionally, recurring meningitis. Diagnosis is confirmed on CT scanning and surgical correction can be carried out.

Abnormalities of the inner ear

The inner ear is the collection of structures within the bony labyrinth: the semicircular canals, the vestibule and the cochlea. Congenital abnormalities here are rare and will result in deafness in addition to possible dizziness, and account for up to 20% of children with sensorineural hearing loss.

People with abnormalities of the inner ear are at increased risk of developing recurrent meningitis or a perilymphatic fistula. Middle-ear infections should therefore be treated aggressively. There is also increased risk of developing cerebrospinal fluid leaks after minor head injuries and therefore avoidance of contact sports is advised.

- These deformities are typically classified according to embryonic developmental stages.
- Any of the structures can be involved.
- Cochleosaccular dysplasia is probably the most common form of inner-ear congenital deformity and is characterised by a collapse of the cochlear duct and saccule.

Patients suspected of having these problems will undergo a thorough clinical, audiological and radiological evaluation. A positive family history can suggest a genetic origin, whilst a detailed history of the pregnancy may reveal a teratogenic cause. This may be backed by blood tests. High-resolution CT scanning will determine the nature and extent of the problem and there will be a multidisciplinary approach to rehabilitation.

CHECK YOUR PROGRESS

3) What are the early indicators of a possible learning disability, M.R, V.I, H.I.

4) Visit an orthopedic center children's section. Observe the children and categorize them into their orthopedic conditions.

SUGGESTED ASSIGNMENT

1) Observe and describe the motor movements of a child (0-2 yrs, 3-5 yrs, 6-8 yrs, 9-12 yrs.) with spasticity, athetoses, ataxia, muscular dystrophy, MMC, and polio.

POINTS FOR DISCUSSION / CLARIFICATION

After going through the unit you may like to discuss or seek clarification on some points if so, please mention the points below :

Points for discussion

Points for clarification

SUGGESTED READINGS
FURTHER READINGS

1. Carol Carter, Joyce Biswhop Keys to Success. How to Achieve your and Sarah Lyman Kravits. (1998) goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986) The child's Language and The Teacher – A Handbook.

3. Lyndon W Searfoss John E. Readence (1994) Helping Children Learn To Read. Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The Trainers of the Mentally Retarded Persons. Pub.: NIMH Sewnderabad.

5. Paul A Albeoto Anne C Troutman (1990) Applied Behaviour Analysis For Teacher Merrill Pub. Co. ohio 43216.

BLOCK – 2 : IMPACT OF HEARING LOSS

UNIT - 1 : CHARACTERISTICS OF LEARNERS WITH HEARING LOSS AND IMPACT OF DIFFERENT DEGREES OF HEARING IMPAIRMENT ON COMMUNICATION

STRUCTURE

INTRODUCTION

Education is very important in life. It can be conceptualized as learning and attainment of skills of Education for All is a universal dream. All the modern nations are trying their best to actualize this dream. Special attention is being provided to conventional known weaker links in the chain of education, self reliance, prosperity and development. These 'marginalized' groups which were untouched by education until very recently are now entering the mainstream education. We need to make our system more accommodative, flexible and warm, so that these groups not only enter the conventional classrooms but also make these classrooms more colorful and rich. Changes are being made towards this purpose. New ideas, modern technology and broad minded philosophy are being passed down from international to national level from national to state level and from state level to schools. One of these extremely useful new ideas is 'inclusive education' and you are the best link of this relay of ideas which actually provides services to children with diverse background. In this sense you are the most important agent of change. Upon your shoulder lies the success of these seemingly theoretical ideas like inclusion; neighborhood school; and free, compulsory, appropriate education. Efforts must be concentrated on empowering you the resource teachers to make education work for ALL. Diversity is not a new reality to India and we Indians do not need any lessons on it since we have been living with it happily. However, we definitely need to operationally define diversity with a broader view. We readily acknowledge diversity linked with religion, language, culture, geographical or economical background. However, diversity created by abilities and disabilities is not very well taken care of. Conventional mindset of looking at disability as curse or 'end of the road' is quite wide spread. This hampers our 'ability' to look at disability as one of the diversities. If you resource teachers can take this positive perspective to families and schools much can be achieved. Among the disabilities, hearing disability has a unique situation which may make the inclusion process slower and difficult. With other disabilities, in general, language and communication are not the primary concerns. With individuals with hearing impairment, this is not the case. Inadequate language and communication have the potential to negatively impact almost all developmental aspects of a child. Moreover, if not dealt with carefully, hearing impairment may delink the child not only from the society but also from the family. You yourself can think of the Section 1 Introduction 4 1 Module on Training of Resource Teachers under SSA on hearing impairment serious concerns created by such a situation. however, thankfully this can be avoided and hence must be avoided. and you have a major role to play here!

OBJECTIVES

- Knowledge related objectives After learning this module the resource teachers will be able to: 1 Present basic summary about key issues related to hearing impairment including definition, kinds, causes, preventions, identification and assessment. ı Help sort out basic doubts of families and other classroom teachers in this connection. ı Monitor best curricular practices in the mainstream school based on this knowledge. ı Be bale to use this basic knowledge to read / get more information as and when necessary. Skill related objectives After learning this module the resource teachers will be able to: ı Explain the audiogram and its interpretation to families and other classroom teachers, ı Monitor the functioning of individual and group amplification systems, ı Describe and clear doubts about curricular adaptations required and not required by each of the students with hearing impairment under her / his supervision, ı Demonstrate examples of appropriate teaching learning material, ı Suggest to families, teachers and school authorities the appropriate tips / steps to facilitate communication, language and social development of students with hearing impairment, ı Prepare individualized plans and monitor their implementation. Attitude related objectives After learning this module the resource teacher will be able to: ı Identify strengths and weaknesses of each of the students realistically, Module on Training of Resource Teachers under SSA on Hearing Impairment ı 7 ı Explain how positive thinking and appropriate action lead to success, ı Suggest novel, workable solutions to deal with various barriers in education, ı

Many people are aware that their hearing has deteriorated but are reluctant to seek help. Perhaps they don't want to acknowledge the problem, are embarrassed by what they see as a weakness, or believe that they can "get by" without using a hearing aid. And, unfortunately, too many wait years, even decades, to address the effects of hearing loss before getting treatment.

But time and again, research demonstrates the considerable effects of hearing loss on development as well as negative social, psychological, cognitive and health effects of untreated hearing loss . Each can have far-reaching implications that go well beyond hearing alone. In fact, those who have difficulty hearing can experience such distorted and

incomplete communication that it seriously impacts their professional and personal lives, at times leading to isolation and withdrawal.
Studies have linked untreated hearing loss effects to:

- irritability, negativism and anger
- fatigue, tension, stress and depression
- avoidance or withdrawal from social situations
- social rejection and loneliness
- reduced alertness and increased risk to personal safety
- impaired memory and ability to learn new tasks
- reduced job performance and earning power
- diminished psychological and overall health

Hearing loss is not just an ailment of old age. It can strike at any time and any age, even childhood. For the young, even a mild or moderate case of hearing loss could bring difficulty learning, developing speech and building the important interpersonal skills necessary to foster self-esteem and succeed in school and life.
At the Better Hearing Institute, our mission is to help educate the public about hearing loss and promote the importance of prevention and treatment. On this website, you will find basic information about hearing loss, including advances in diagnosis and treatment, a review of different hearing aids, and resources for medical care and financial assistance.
If you think you or a loved one suffers from hearing loss, don't delay another day. Visit a hearing healthcare professional and take the first step toward a world of better hearing.

Effects of Hearing Loss on Development
It is well recognized that hearing is critical to speech and language development, communication, and learning. Children with listening difficulties due to hearing loss or auditory processing problems continue to be an underidentified and underserved population.
The earlier hearing loss occurs in a child's life, the more serious the effects on the child's development. Similarly, the earlier the problem is identified and intervention begun, the less serious the ultimate impact.
There are four major ways in which hearing loss affects children:

1. It causes delay in the development of receptive and expressive communication skills (speech and language).

2. The language deficit causes learning problems that result in reduced academic achievement.
3. Communication difficulties often lead to social isolation and poor self-concept.
4. It may have an impact on vocational choices.

Specific Effects

Vocabulary

- Vocabulary develops more slowly in children who have hearing loss.
- Children with hearing loss learn concrete words like *cat*, *jump*, *five*, and *red* more easily than abstract words like *before*, *after*, *equal to*, and *jealous*. They also have difficulty with function words like *the*, *an*, *are*, and *a*.
- The gap between the vocabulary of children with normal hearing and those with hearing loss widens with age. Children with hearing loss do not catch up without intervention.
- Children with hearing loss have difficulty understanding words with multiple meanings. For example, the word *bank* can mean the edge of a stream or a place where we put money.

Sentence Structure

- Children with hearing loss comprehend and produce shorter and simpler sentences than children with normal hearing.
- Children with hearing loss often have difficulty understanding and writing complex sentences, such as those with relative clauses ("The teacher whom I have for math was sick today.") or passive voice ("The ball was thrown by Mary.")
- Children with hearing loss often cannot hear word endings such as *-s* or *-ed*. This leads to misunderstandings and misuse of verb tense, pluralization, nonagreement of subject and verb, and possessives.

Speaking

- Children with hearing loss often cannot hear quiet speech sounds such as "s," "sh," "f," "t," and "k" and therefore do not include them in their speech. Thus, speech may be difficult to understand.
- Children with hearing loss may not hear their own voices when they speak. They may speak too loudly or not loud enough. They may have a speaking pitch that is too high. They may sound like they are mumbling because of poor stress, poor inflection, or poor rate of speaking.

Academic Achievement

- Children with hearing loss have difficulty with all areas of academic achievement, especially reading and mathematical concepts.
- Children with mild to moderate hearing losses, on average, achieve one to four grade levels lower than their peers with normal hearing, unless appropriate management occurs.
- Children with severe to profound hearing loss usually achieve skills no higher than the third- or fourth-grade level, unless appropriate educational intervention occurs early.
- The gap in academic achievement between children with normal hearing and those with hearing loss usually widens as they progress through school.
- The level of achievement is related to parental involvement and the quantity, quality, and timing of the support services children receive.

Social Functioning

- Children with severe to profound hearing losses often report feeling isolated, without friends, and unhappy in school, particularly when their socialization with other children with hearing loss is limited.

- These social problems appear to be more frequent in children with a mild or moderate hearing losses than in those with a severe to profound loss.

What You Can Do

Recent research indicates that children identified with a hearing loss who begin services early may be able to develop language (spoken and/or signed) on a par with their hearing peers. If a hearing loss is detected in your child, early family-centered intervention is recommended to promote language (speech and/or signed depending on family choices) and cognitive development. An audiologist, as part of an interdisciplinary team of professionals, will evaluate your child and suggest the most appropriate audiologic intervention program.

As people move through the activities of daily living at home, at work, and in social or business situations, basic auditory abilities take on functional significance. Audition makes it possible to detect and recognize meaningful environmental sounds, to identify the source and location of a sound, and, most importantly, to perceive and understand spoken language.

The ability of an individual to carry out auditory tasks in the real world is influenced not only by his or her hearing abilities, but also by a multitude of situational factors, such as background noise, competing signals, room acoustics, and familiarity with the situation. Such factors are important regardless of whether one has a hearing loss, but the effects are magnified when hearing is impaired. For example, when an individual with normal hearing engages in conversation in a quiet, well-lit setting, visual information from the speaker's face, along with situational cues and linguistic context, can make communication quite effortless. In contrast, in a noisy environment, with poor lighting and limited visual cues, it may be much more difficult to carry on a conversation or to give and receive information. A person with hearing loss may be able to function very well in the former situation but may not be able to communicate at all in the latter.

Communication Access. Communication access for people with hearing loss can be described as "the right of deaf and hard of hearing people to receive and understand information and signals presented directly … and … the lack of barriers to, and the concomitant presence of access to, visual or auditory communication" (Barnartt, Seelman, and Gracer, 1990, p. 50). Individuals with hearing loss can perform as well as their counterparts without hearing loss when equitable educational and employment opportunities are provided (Schroedel and Geyer, 2000). These equitable opportunities are dependent on the individual student or worker having access to the information necessary for learning or for getting the job done. The nature of this communication access depends on individual needs and the auxiliary aids available to address these needs. For example, a deaf person who is unable to use the telephone can use a TTY or computer system and can communicate with hearing peers through telephone or Internet relay systems. These systems provide operators who type or, via video, sign the hearing person's spoken words for the deaf caller and voice the deaf person's typed words or signed phrases for the hearing caller.

In the educational setting, an individual with a hearing loss is most likely to have trouble hearing what is said. In these situations, communication access is enhanced with the use of FM systems and other assistive listening devices, computer-assisted note-taking systems, and other accommodations. However, for various reasons, including background noise in the classroom, communication is often less than clear, thereby affecting access to the English language and educational discusses hearing loss in an educational setting in greater detail.

Those with education are less likely to be in need of Social Security Disability Insurance and Supplemental Security Income (SSI) than those without education (Clarcq and Walter, 1997-1998). Most worrisome, however, is the 44 percent high school dropout rate among deaf students (Blanchfield, Feldman, Dunbar, and Gardner, 2001), compared with a general population rate of 19 percent. With high-stakes testing now being instituted by the states, the potential for this dropout rate to increase is high.

Buchanan (1999) notes that in addition to employer resistance to hiring deaf individuals, the automation of many work functions has disadvantaged the unskilled deaf worker. The implication here is that education is a critical factor that facilitates occupational entry and mobility for the deaf worker. The generally lower educational achievement of deaf persons continues to contribute to vocational difficulties. Those who lose their hearing later in life, and whose jobs depend on effective communication, run the risk of eventually losing their jobs if satisfactory accommodations, including the provision of auxiliary aids that meet their communication needs, are not instituted.

Americans with Disabilities Act. Title V of the Rehabilitation Act of 1973 was landmark legislation enacted to address job discrimination in federally supported programs that affected qualified people with disabilities (National Association of the Deaf, 2000). Under the Americans with Disabilities Act of 1990 (ADA), which was enacted in part because of pervasive ongoing discrimination in the mainstream of American public life, the removal of communication barriers (which deny information access for individuals with hearing loss equivalent to what hearing persons might have) became a legal right for deaf and hard-of-hearing people (National Association of the Deaf, 2000). The legal protection of both acts

covers individuals who can demonstrate that, even with corrective devices such as hearing aids or cochlear implants, they have a substantial impairment to a major life activity—for example, the inability to distinguish words due to background noise on the job. Public venues must provide auxiliary aids or services when necessary. A comprehensive list of auxiliary aids and services required by the ADA is included in the corresponding regulations, with the understanding that evolving technology will create new devices.

DEFINITIONS

Hearing impairment of a child should not turn into hearing handicap because he/she did not get adequate support from family, school or from community. Who can prevent hearing impairment (physical reality) turning into handicap (personal, social and functional restriction)? You are one of the team members who can do it. You are already empowered to do it since you have your degree / diploma in special education. However, during your earlier course your focus was on one of the disabilities and now you have to deal with all the disabilities. You need to know little more, you need to learn little more. This training module and material intends to empower you with these additional skills and knowledge. Also, most of the syllabi in special education today equip trainees to teach in a special school. Now you have to work with mainstream schools and deal with school authorities, colleagues, families, students who are not aware of the disability issues. You have to be the leader in disability advocacy and make things happen for the students with special needs in your school. This module is designed to help you do this. The module is classified into three types of activities. Theory, practical and hands on practice. The section on theory (PART A) brushes up primary issues about hearing disability like types, causes and identification. It also touches upon complex yet very important concepts like functional assessment and communication concerns of the children with hearing impairment. The second part of the module (PART B) is skill oriented wherein you are expected to understand little theoretical background of each aspect to be able to learn the skills related to that information. This will help you gain confidence while dealing with a student with hearing impairment. This section will help you turn theory into desirable practice. You will learn many important skills related to TLM, IEP, communication, curriculum adaptations, need management etc. It is said that however much you know your theory; you will understand some things only when you see or do them yourself. For example, there is no other way of learning to swim but to get into water and move your limbs. With disability management and education also there are some things which you will learn only through first hand experience. The third part (PART C) deals with these issues and intends to give your hands on experience with some of the skills. The major focus in this section is development of speech, language and social skills. As an outcome of the learning of all the three parts you become professionally ready to manage a child with hearing impairment in a mainstream school. But please do not consider that the learning is over when you master this module. There is much more to hearing impairment than the few concerns discussed in this module. The environment you will be placed in, the families you bump into, the students you are made in charge of and your colleagues who are classroom teachers Module on Training of Resource Teachers under SSA on Hearing Impairment ı 5 may not respond to disability the way you would want them to. Achieving the goal of sustained educational development may appear simple for some students; difficult with a few others and almost impossible with some. Remember, positive thinking, taking initiative in bringing about change and involving others in your mission will be your keys to success. If this module prepares you to believe in it and be confident while taking right decisions, appropriate actions and out of box steps towards inclusive education, the purpose of this module will have been served.

SUMMARY

Various modern, technically advanced instruments and softwares are used to measure hearing loss. These are subjective types or objective types. The most commonly used conventional procedure is pure tone audiometry. In this measurement the individual under testing is expected to indicate whether he/she heard each of the sounds presented to him/her. These sounds are of varying frequencies and intensities. The responses of the individual are plotted on a graph called audiogram. As a routine, we all need to go through and superficially understand various medical reports. Initially we may not understand the numbers and figures but over the period of time we do start getting the overall impression. An Audiogram is no exception. Teachers and family members soon get familiar with the details, these details are vital for educational planning. Please have a look at the following audiograms of Prashnakumari and Dost. Try to understand the meaning. Look at Prashnakumari's audiogram. This is how the audiogram of a normal hearing person looks. Prashnakumari could respond to each of the frequency of the pure tone sound given to her through the headphone. All her responses are present to sounds around 10 dB.

The course of children's development is mapped using a chart of developmental milestones. These milestones are behaviors that emerge over time, forming the building blocks for growth and continued learning. Some of the categories within which these behaviors are seen include: ı Cognition (thinking, reasoning, problem-solving, understanding); ı Motor coordination (gross/fine motor, jumping, hopping, throwing/catching, drawing, stacking); ı Social interaction (initiating peer contact, group play); ı Adaptive (dressing, eating, washing); By age one ı Recognizes name; Says 2-3 words besides "mama" and "dada"; □ Imitates familiar words;

Between one and two □ Understands "no";

Uses 10 to 20 words, including names; ı Combines two words such as "daddy bye-bye"; □ Waves good-bye and plays pat-a-cake; ı Makes the "sounds" of familiar animals; □ Gives a toy when asked; □ Uses words such as "more" to make wants known; □ Points to his or her toes, eyes, and nose; ı Brings object from another room when asked. Between two and three ı Identifies body parts; □ Carries on 'conversation' with self and dolls; □ Asks "what's that?" And "where's my?" □ Uses 2word negative phrases such as "no want"; □ Forms some plurals by adding "s"; book, books; □ Has a 450 word vocabulary; □ Gives first name, holds up fingers to tell age; Combines nouns and verbs "mommy go"; □ Understands simple time concepts: "last night", "tomorrow"; □ Refers to self as "me" rather than by name; □ Tries to get adult attention: "watch me"; □ Likes to hear same story repeated; □ May say "no" when means "yes"; □ Talks to other children as well as adults; □ Solves problems by talking instead of hitting or crying; □ Answers "where" questions; ı Names common pictures and things;

Uses short sentences like "me want more" or "me want cookie"; □ Matches 3-4 colors, knows big and little. Between three and four ı Can tell a story; ı Has a sentence length of 4-5 words; ı Has a vocabulary of nearly 1000 words; ı Names at least one color; ı Understands "yesterday," "summer", "lunchtime", "tonight", "little-big"; □ Begins to obey requests like "put the block under the chair"; □ Knows his or her last name, name of street on which he/she lives and several nursery rhymes. Between four and five ı Has sentence length of 4-5 words; ı Uses past tense correctly; ı Has a vocabulary of nearly 1500 words; ı Points to colors red, blue, yellow and green; ı Identifies triangles, circles and squares; □ Understands "In the morning" , "next", "noontime"; □ Can speak of imaginary conditions such as "I hope"; □ Asks many questions, asks "who?" and "why?" Between five and six □ Has a sentence length of 5-6 words; ı Has a vocabulary of around 2000 words; ı Defines objects by their use (you eat with a fork) and can tell what objects are made of; □ Knows spatial relations like 'on top", "behind", "far" and "near"; □ Knows her address; □ Identifies a penny, nickel and dime;

Patanjali associated the care of disability with Yoga. He taught Gouda pathaga who was a dull person.

- Firstly, Kautilya (4th Century B.C.) banned the use of terms insulting to persons with disabilities. And he employed many disabled people in spy network.
- King Henry 2nd of Britain was the first person who enacted legislation differentiating people with mental retardation from those with mental illness.
- Although the concept of special education and related systematic services took shape in Europe in the early 19th century, however, Jean Marc-Gaspard Itard (1774-1838) initiated first systematic training to educate mentally retarded people.
- The first residential institution of comprehensive treatment for mentally handicapped children was established by Hohann Guggenbuhl (1816-1863) in 1841 in Switzerland. Special education began in modern India at Varanasi in 1826 by K.S.-Ghosal.
- In India, the first institute for disabled people was established in 1884 in Bombay. This was for the deaf and the mute persons, and, for the blind the Braile system came to India in 1886.
- Alfred Binet's intelligence test, developed in 1907, became the revolutionary event in the field of special education
- In 1954, Mr Srinivasan began the special class in a regular school at Andheri in Mumbai.

- Special education was manoeuvred by the development of the Vocational Rehabilitation Act and Education for All Handicapped Children Act in 1970s.
- In 1990, Disability Act came into force in America. In India The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 was the landmark legislation.

The Ministry of Social Justice and Empowerment has planned to establish six Composite Regional Centres in all over India during the period of 2000-2001, out which 5 are functioning.

CHECK YOUR PROGRESS:

1 What is the use of reading historical and legislative issues.

2 Clarify disability and handicap.

3 Evaluate the functions of the Rehabilitation council of India regarding education for persons with disabilities.

ASSIGNMENT/ ACTIVITY

Discuss the persons with Disabilities (Equal opportunities, protection of Rights and full participation) Act, 1995 with the people in your surrounding.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to haved further Clarification and Discussion on some Points.

Points for discussion

Points for clarification

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UNIT-2: LANGUAGE & COMMUNICATION ISSUES ATTRIBUTABLE TO HEARING LOSS AND NEED FOR EARLY INTERVENTION

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

This module consists of a developmental chart indicating age-wise milestones of non impaired, typically developing children (chapter: A5). Compare age-wise development of each child against the norms given in the chart. Particular child in your mind must have developments as per the chart. With this comparison you will know whether the child requires further assessment or not. Do not panic for any small deviations from the chart, these developmental milestones are not hard and fast rules which each child follows rigidly. Yet they provide a general framework of when to expect what. For any doubts – further assessment is a must! For the second group of school age children, you must suspect hearing loss when: (1) The child appears to have 'strange', 'different', 'unclear' speech. (2) The child appears to have problem paying attention or concentrating in class. (3) The written matter of the child shows missing gaps in places of word endings like ed, ing, ly etc. (4) The child appears to be lonely, isolated, away from group activities. (5) The child brings one ear ahead while listening. (6) The child speaks too loudly or softly.

(7) The child who keeps, radio, TV, tape recorder on high volume. (8) The child does not respond to a question asked from behind. (9) The child does not respond to a question asked from a distance. (10) The child does not respond to his name or a question asked from another room. Even if a particular child has just one indicator given above, please refer him / her for further assessment

You have just learned that your child has a hearing loss. You have many questions and you are not alone. Other parents of children with hearing loss have the same types of questions. All your questions are important. For many parents, there are new things to learn, questions to ask, and feelings to understand. It can be very confusing and stressful for many families. Many services and programs will be available to you soon after your child's hearing loss is found. When a child's hearing loss is identified soon after birth, families and professionals can make sure the child gets intervention services at an early age. Here, the term intervention services include any program, service, help, or information given to families whose children have a hearing loss. Such intervention services will help children with hearing loss develop communication and language skills. There are many types of intervention services to consider. We will talk about early intervention and about communication and language. Some of the services provided to children with hearing loss and their families focus on these topics. This booklet can answer many of your questions about the early intervention services and choices in communication and languages available for you and your child.

Timing: The age when a hearing loss has occurred is known as "age of onset." You also might come across the terms prelingual and postlingual. A prelingual hearing loss occurs before a child has learned to understand and use language. A postlingual hearing loss occurs after a child has learned some language.

Location: There are three parts to the ear—the outer ear, middle ear, and the inner ear. Sound travels from the outer ear through the middle ear to the inner ear. A conductive hearing loss involves the outer ear, the middle ear or both. A sensorineural hearing loss involves the inner ear. A mixed hearing loss is a combination of both conductive (outer or middle ear, or both) and sensorineural (inner ear) hearing losses. Auditory neuropathy and central hearing loss involve the nerve that connects the ear to the brain (hearing nerve) or the part of the brain that helps us understand the sounds we hear, or both. Other words you might encounter are unilateral or bilateral. Unilateral means "one side"; therefore, a unilateral hearing loss involves only one ear. Bilateral refers to both sides, and a bilateral hearing loss involves both ears. Degree: You also might encounter words such as mild, moderate, severe, and profound when researching hearing loss. These terms are used to describe how much hearing loss has occurred.

Each child is unique, with his or her own personality, talents, and preferences. And, in the same way, your child's hearing loss is also unique. Also, research suggests that about one-third of all children with hearing loss have one or more other special needs or conditions that have nothing to do with the ear or hearing. These needs might involve visual or physical abilities, or other special conditions. All these factors go into making your child the unique person he or she is. They are important when you and professionals work together to choose the kind of interventions that will best match the strengths and needs of your child. These professionals include audiologists, early intervention specialists, speech and language pathologists (also called speech therapists), teachers of the deaf and hard of hearing, and your child's doctors.

They say that a good understanding of the problem is the first step towards finding the solution to that problem.

The "problem" we are addressing is: "What happens to communication between two or more individuals when one of them experiences a hearing loss?" These individuals may be in personal relationships as friends, as spouses or in professional relationships such as co-workers or support providers. For the person with a hearing loss, this could also involve their relationship with society in general affecting such activities as watching television, listening to the news, going to the theatre or to a concert. All of these circumstances are opportunities for communication, the essence of our participation in our society. They all suffer as a consequence of hearing loss.

I am hearing, absolutely no hearing loss that I am aware of. Why then do I dare to address such a group with the pretense that I may be able to provide some insight into communication issues that affect them? I have worked in the field of mental health for many years and think I have gathered and understanding of the link between communications and mental health issues. Please don't be offended by my use of the terms "mental health issues". We all have mental health issues, many of them arising from losses in our lives. Hearing loss is one of those losses. However, it is more significant and pervasive in that it affects the communication process. It disrupts all our human relationships, be they with families, friends or co-workers. Not only does one suffer a loss, one is also affected by the inability to communicate with others about that loss.

The first thing one must understand is that individuals have different ways of communicating and we must respect the other's style of communication, which may be based on personality, but also on other more fundamental physical abilities as basic as the ability to hear spoken words. Communication involves at least two persons who take turns in the roles of transmitter and receiver. If some individuals can not hear certain words, they cannot be expected to readily understand full sentences and conversations and thereby participate equally in the process. However, when there is a hearing loss, the responsibility for the consequent mis-communication is usually attributed solely to the person with the hearing loss. But, regardless of hearing capacity or other similar communication challenge that the other may face, it is important that the communicator, if he or she values being understood, ensures that the other party has access to the information relevant to the communication, even more so if they are expected to participate as equals in the communication process. This is especially important if the other person has difficulty hearing. Persons with a hearing loss may feel that their hearing counterparts are lacking in this area and they may often be right. We must try to understand why. People often try to hide their hearing loss and when they do, the other cannot understand and therefore cannot compensate in their role in the communication process.

There has been considerable talk in recent years of the wonderful innovations and development that have taken place in the world of technology. Many of these technological developments have had an enormous impact on persons with a hearing loss, opening a whole new world of interaction between people over the internet. Such tools as the ICQ has opened communication highways throughout the world. Deaf, deafened and hard of hearing individuals have been able to use these tools to finally gain access to countless services and limitless sources of information. However, this may have overshadowed our attempts to understand and improve our understanding of the one-to-one, face-to-face communication between two individuals. What happens when one of the two individuals can only hear a fraction of the words being said by the other? And is not the most important component of communication the face-to-face interactions with facial expression and body language?

But before we begin, I would like to play a little game with you. We will let our imaginations wander. I will present you with a number of situations which I will ask you to imagine for yourself. You may be as brief or elaborate as you wish but spontaneity is important. If you change your mind, you may want to remember that later.

Icebreaker: Path, Woods, Cup, Fence, Bear, Telephone, Lake, House.
I have always found this to be a fun and revealing test and I hope you were able to laugh with it. However, I would now like to ask you: "Would your answers have been different before your hearing loss? And if so, how?" I do not expect you to answer these questions now, in public but ask you to answer them for yourselves and think about how they reflect the changes that have occurred in your life as a result of your hearing loss. My hope is that this understanding of changes in your perception of your immediate environment combined with an understanding of the changes in the communication process will help you, and your family, friends, peers and employers find communication

strategies that clarify the causes of miscommunication and offer solutions that alleviate frustrations experienced by both parties.

I would like to explore these ideas with you. Loss of communication is the primary impact of hearing loss. This loss of communication manifests itself in two ways. The most obvious is the inability to hear that results in the hard of hearing persons reduced access to the full context of the conversation. A less obvious effect is the change in the manner of organizing and communicating information.

I am sure we can all share experiences, both humourous and less so, that we have lived, and the consequent frustrations, anger and isolation.. However, it is not my intent here to talk about the emotional impacts of hearing loss. I do not plan to address the changes in the relationships between the persons who is becoming hard of hearing or deafened and others, either in the workplace or with family and friends. I believe these topics have already been discussed at length by others. It is rather my intent to discuss the mechanics of verbal communication and the changes that occur with hearing loss. The intended result is twofold:

1. If we understand what is actually happening with our use of words as a result of the hearing loss, we will be in a better position to make more efficient use of those words.
2. When both hearing and hard of hearing persons realize that there is a mechanical process that is changing and understand how this process is changing, we will tend to become much less frustrated with each other.

The substance of this paper originated in my personal experience as a hearing mental health counsellor trying to understand why my "proven" clinical skills appeared to become inefficient with a person with a hearing loss. I could not understand why clinical skills that had proven successful in the past now appeared inefficient. It finally occurred to me that the problem might not be with the counselling techniques but rather with the process of communication between myself and the client. Although the client and myself obviously understood each other, felt that the client/therapist relationship and trust was established, wanted to continue the process, at some point, communications broke down. I no longer knew what was the focus of the client's concerns and decided to explore the communication process. I will not delve into detail about that specific situation but I will say that research into that led me to some relevant observations about communication with hard of hearing individuals. That is what I would like to share with you at this time. I should add that, at very early stages of this endeavor, I presented these ideas to a group of couples where one of the partners was experiencing a hearing loss and, although at the time little research has been completed, they all supported my observations with regards to the reason for the breakdown of communications. That convinced me to expand my observations to progressive hearing loss as well as to early onset deafness.

Some of what I will present at the beginning of this session may appear technical and scientific but please don't let that deter you. It is meant to show that there is scientific research that supports what I am saying and I will try to present that information in such a way as to build up to the more important content, the practical knowledge that will facilitate day to day communication.

Hearing loss has a dramatic impact on daily verbal communication between individuals, be it in the context of personal family life, the work environment or social relationships. It is important to understand how communication is affected if we are to find ways to reduce the frustrations of all parties involved. When we understand why communication is breaking down, we can compensate for that and reduce the frustration experienced by all.

That being said, let us look at concrete examples of the communication process. I have tried to develop visual examples of changes in the communication process that result from hearing loss and the impact on the thought processes. Let us look at a sentence that would be quite normal and acceptable in most conversations between hearing individuals.

OBJECTIVES

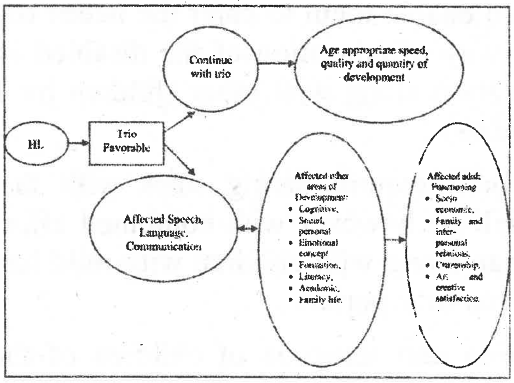
After going through this unit you will be able to understand:

- Basic formulation and strategy of education for the disabled included the NPE (1986).
- Educational needs of disabled persons, and, plans and programmes to be implemented for the purpose
- Current position of education for the disabled in India.

DEFINATIONS

Prashnakumari got to know more about hearing loss. She knew that the hearing aid helps Dost listen. She knew that his speech and language were not age appropriate. But she always wondered why Dost had problems with reading text books? She also noticed that Dost had very few friends. When she went to the school councilor with Dost, she asked him her doubts. Initially we have seen the difference between the terms 'impairment' and 'handicap'. Impairment is the biological / physical loss which can be of trivial nature. However, this impairment turns into a handicap which is far more serious than the physical loss. It is like physical reality creating barriers in individual's functioning and social participation. Therefore while studying the impact of hearing loss on learning we must deal with cases of 'hearing impairment' and 'hearing handicapped' separately. There are a few prerequisites which, if fulfilled can prevent hearing impairment turning into a handicap. In numerous of cases in India these prerequisites are not fulfilled. Therefore, this section discusses the case of that typical child with hearing loss who has NOT got the support of other factors and hence the magnitude of the negative impact of hearing loss on his/her functioning is greater. Many of the SWHI that you get to work with will be of this type and it is this type of SWHI who need your attention, time, and resources than the smaller number of SWHI who do not have severe concerns in terms of communication and education.

Figure # 2: Nature of Hearing Loss: Magnitude of Concern



Please look at the diagram carefully. You will notice that the first concern after the hearing loss is diagnosed is to see whether the trio is favorable or not. What is this trio? Trio means the three essential factors which play a major role in determining the level of functioning of the child. These are: early intervention, parental involvement and access to communication (either with the help of ACE hearing aid or natural exposure to sign language). If these three factors are taken care of then the chances of the development of the SWHI can be expected to be at par with the nonimpaired peers. The term 'Development' here refers to speed of development, quality of development and quantity of development. However, if these three factors are not favourable then the impact of hearing impairment on development and learning is of a greater extent. First and foremost it impacts the development of speech language and communication. Most of the (not all) SWHI that you come across may have concerns in these areas. It is very urgent and essential that they be provided with the three factors

of health services; nutrition standard, maternal care and other effective measures to prevent disability the incidence of disability can be reduced. As a result, the absolute number of handicapped children won't increase. For the, leastways, 10000 special schools with 150 to 200 admission each will be required. As education in special schools is very costly, so, it will be ensured that only those children whose needs can not be fulfilled in common schools, should be enrolled in these schools, It has also been assumed that the improved efficiency of the common schools would enable them to cater the needs of the disabled children. But the best way of education of the disabled is 'universalisation ' of primary education along with other children by 1990 (6-11 years) and 1995 (6-14 years)

Albeit, it would require daring steps with facilities, resources and trained specialists; however with combined efforts children with loco-motor handicap along with children with mild handicap can be covered within the given time period.

The registration and retention of children of these two categories of handicap would be increased by 25% each year through the following methods: -

- Organizing advocacy programme for administrators and teachers in the common schools.
- Including training component on the management of this group of children in the in service training programme of teachers.
- Orientation programme for the administrators and supplementing it through distance learning programme also.

SUMMARY

What role does language play in the understanding of subject textbooks of History, Geography, Science, civics, Mathematics? Language plays a major or a rather essential role in understanding and processing of school subjects. Knowledge of school subjects is given, processed and taken predominantly through a tool called language. You will not be able to teach science without using language and a SWHI will not be able to learn science without using language. Language is the tool though which information is: ı Gained (taken in); ı Sorted out (registered – throwing out unnecessary and forwarding the necessary); ı Processed (organizing, classifying, linking with earlier information); ı Stored (in either short term or long term memory); ı Retrieved and used; ı Put into practice; ı Updated; ı Evaluated. If the SWHI does not have adequate age appropriate language base then this linguistic inadequacy creates problems in all the processes mentioned above. You can get an idea of language and information processing of the SWHI after reading this. However, remember this does not mean that they are incapable of learning or they are slow or deficient learners. Nor are they intellectually deficient low. It simply means that their needs are different and they need different teaching learning strategies. It means at least three things: (1) You have to ensure natural and complete access to communication; (2) You have to keep working on language separately and over and above language textbook; (3) You have to use alternate / flexible / visually oriented classroom strategies for the SWHI. Things Worth Trying! ı Make a small leaflet describing the mediating role that language plays in the overall development and functioning of a SWHI. ı Write down how different SWHI with varying degrees of negative impact of hearing loss would have on different educational needs. Can you see the connection between the needs of special schools and not fulfilling the trio of preconditions? Describe the same. Children with Deafness and Communication Concerns Soon Prashnakumari and Dost became friends. She learnt to communicate well with him. Yet many a times she would find it difficult to put across her ideas to him. Dost has hearing loss which I know – she would think, but why is he unable to communicate like other classmates? Let us begin with the title of this chapter. Why does it use the term deafness rather than hearing impairment? We had seen in the first chapter itself that the word deafness refers to profound SN hearing loss since birth. On the other hand the term 'hearing impairment' refers to all the degrees - from mild to profound. We also know that the degree, type and nature of the hearing loss significantly determine what age-appropriate things that the child can do and cannot do. In this section we want to discuss the communication concerns of children with profound degree of hearing loss and hence the title consists of the term 'children with deafness' rather than 'children with hearing impairment

CHECK YOUR PROGRESS

1. Critically evaluate the chapter of 'Education of the Handicapped' of the National Policy on Education, 1986.
2. define the Programme Of Action and discuss the PoA, 1992.

ASSIGNMENT/ ACTIVITIES

Have a discussion on the National Policy on Education, 1986 with special reference to the chapter of 'Education for the Handicapped', and the 'programme of Action, 1992, with your teacher and colleagues. Give some suggestions also.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to haved further Clarification and Discussion on some Points.

Points for discussion

Points for clarification

REFERENCE

1. National Policy on Education 1986, 'published by the Ministry of Human Resource development, Government of India.

2. 'Education of children with special need' published in the 'DPEP CALLING', April-July, 2000.

3. The NCERT:1986-1999, published by National council of Educational Research and Training, New Delhi.

UNIT - 3 : COMMUNICATION OPTIONS, PREFERENCES & FACILITATORS OF INDIVIDUALS WITH HEARING LOSS

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Communication Options
What Are My Child's Communication Options?

- What are communications options?
- Why do I need to select one for my child?
- A brief look at:
    - Listening and Spoken Language
    - Cued Speech/Language
    - American Sign Language/Bilingual-Bicultural
    - Total Communication Method

What are communication options?
For years many professionals in the hearing loss community talked with families about communications "options" for their child; however, it is

more common today to use the term "outcomes" because professionals are more focused on the success of the child. There are several outcomes for a person with hearing loss to choose from to communicate with their family, peers and the rest of the world. When a doctor, teacher or other person involved with your child talks about communications outcomes, they are talking about the four main types of language for people with hearing loss: Listening and Spoken Language, Cued Speech/Language, American Sign Language/Bilingual-Bicultural and Total Communication Method.

Why do I need to select one for my child?

It is called a communication outcome because each of these communication methods requires hard work and dedication, from learning the method to mastery. It is important to stick with one option for long enough to determine that it is the right one for you and your family and that it is reaching your desired goals. A child's brain is ready to learn language at an early age. Even though they are not able to understand or communicate back right away, you are laying the foundation of learning language from day one.

It is important to understand that any decision for your child's future is for you to make as a family. You will have many decisions to make, and you as the parent/guardian of your child know what is best for them.

Many people struggle with these decisions, and for good reason. Making these decisions about your child's future can be scary. The advice we hear most often is to trust your instinct. Learn as much as you can about the different communications outcomes, and determine what is best for your child and your family.

Listening and Spoken Language

This approach to language development requires that infants and young children with hearing loss are taught to listen and talk with the support hearing technology, such as hearing aids or cochlear implants. Parents and caregivers are supported in their role as the child's most important teacher of language, and the goal is for the child to attend mainstream schools. Read more about Listening and Spoken Language.

Cued Speech/Language

Cued Speech is a visual communication system that can be used to demonstrate phonetic information for children who may not be able to learn entirely though amplified hearing. Designed to enhance lipreading ability, Cued Speech combines the natural mouth movements of speech with eight hand shapes (cues) that represent different sounds of speech.

American Sign Language/Bilingual-Bicultural

American Sign Language is a manual communication language taught as a child's primary language, with English taught as a second language. American Sign Language uses hand symbols and gestures combined with facial expressions to communicate language. American Sign Language is recognized as a true language in its own right and does not follow the grammatical structure of English. This method is used extensively within the Deaf community, a group that views itself as having a separate culture and identity from mainstream hearing society.

Total Communication Method

Total Communication uses a combination of methods to teach a child, including a form of sign language, finger spelling, speech reading, speaking and amplification. The sign systems used in Total Communication are typically based in English word order and follow English grammatical structure, and do not represent a separate language as with American Sign Language.

Infants who are hard of hearing or deaf, have, like their hearing peers, the same capacity to learn language, as well as a desire to communicate. However, the infant who has a congenital or early onset hearing loss whose parents use a spoken language (e.g., English, Spanish, etc.) will not experience the same acoustic language environment as infants with normal hearing. Indeed, this is the case for the vast majority (93%), where one or both parents of children with hearing loss themselves hear normally and communicate using a spoken language [Gallaudet Research Institute, 2002]. Although visual input influences speech perception, only a limited amount of information is available from the lips and face to distinguish among phonemes. Only about 40% of speech sounds are visually distinguishable [Woodward and Barber, 1960]. Therefore, developing spoken language through speechreading (lipreading) alone is challenging at best, and often unachievable. Children who are congenitally hard of hearing or deaf and are raised in families who are also deaf and use a visual (signed) language also develop visual language effortlessly. Any degree of hearing loss restricts access to some or all of the acoustic features of speech. Thus, hearing loss may delay the acquisition of expressive and receptive spoken language, limit academic performance (in particular, the development of literacy skills), and later constrain an individual's opportunities for vocational choice and advancement [see Carney and Moeller, 1998, for an overview]. According to the 2000 –2001 Annual Survey of Deaf and Hard of Hearing Children and Youth [Gallaudet Research Institute, 2002], 32% of children aged 0 –21 years in the United States have profound hearing loss (90 dB HL), while 41% of children were categorized as having moderate (41–55 dB HL) to severe (71–90 dB HL) hearing loss. Remaining children (27%) were categorized as having 40 dB average hearing level or better (mild loss of hearing). Children who are considered hard of hearing (90 dB HL average hearing loss) usually benefit from conventional amplification systems (hearing aids, assistive listening devices, and FM technology). Through use of aided residual hearing and exposure to a language-rich environment, children who are hard of hearing may acquire spoken language in a manner similar to that of children who hear normally [Moeller, 2000]. Children who have profound hearing loss (average hearing 90 dB HL) are frequently referred to as deaf, although this does not necessarily indicate the total absence of hearing. These children experience multiple challenges in the acquisition of a spoken language. The auditory consequences of profound hearing loss (e.g., restricted dynamic range, compromised frequency resolution) limit these children's abilities to benefit fully from conventional forms of amplification. It is this group of children that currently are considered candidates for cochlear implantation. In addition to the degree of hearing loss, the acquisition of age-appropriate language is influenced by additional external and internal factors such as the age of the child at identification of the hearing loss, the availability of appropriate early intervention programs, the communication environment of the home, and the amount of parent involvement/ participation in the child's intervention program [Yoshinaga-Itano et al., 1998; Moeller, 2000]. Universal newborn hearing screening (UNHS) is the direct testing of all neonates before hospital discharge or by one month of age [JCIH, 2000] and the practice has become a public health initiative in the majority of states in the U.S. The goal of UNHS programs is to identify children with congenital hearing loss (bilateral and unilateral 30 –40 dB HL) in the newborn period for the purpose of enrollment in an early intervention (EI) program [NIDCD, 1993; AAP, 1999; JCIH 2000]. One goal of Early Hearing Detection and Intervention (EHDI) programs (screening by one month, confirmation by three months, intervention by six months) is to provide infants with permanent hearing loss amplification technology as early as possible (when parents choose) in order to maximize the development of auditory skills and facilitate spoken language development. EHDI programs (covering children 0 –3 years), the availability of new amplifi- cation technologies, cochlear implantation at 12 months of age, and the passage of U.S. and state health and education laws all have fostered a milieu regarding infants with hearing loss that has not existed in the past. While the ability to detect and provide early intervention to infants with congenital/early onset hearing loss has signifi- cant benefits [Yoshinga-Itano et al., 1998; Moeller, 2000], this dynamic context often exerts pressure on families to make choices regarding the management of their child's hearing loss and communication development well before many have the emotional capacity or the knowledge to do so [Moeller and Condon, 1994]. Fortunately, there is a growing movement among early interventionists that these decisions should be incorporated into an ongoing, familycentered exploration of communication options [Luterman, 1994; Roush, 1994; Moeller and Condon, 1994]. This dynamic process is predicated on a family-centered approach to early intervention in which the needs of the family and child are explored as part of an ongoing process and parentinfant communication becomes the primary goal. Currently, less emphasis is placed on the specific method used to communicate (see below) and more on ensuring that language is abundant and exchanges are easy and frequent between the infant and family members. This familycentered approach also empowers parents to consider changes in how they communicate with their child whenever it is indicated throughout childhood [Moeller and Condon, 1994]

VISUAL LANGUAGE As referenced above, the language used by individuals who are hard of hearing or deaf can be broadly categorized as either spoken or visual. English is the predominant spoken language used in the U.S.; however, other spoken languages (e.g., Spanish, French) are also used within families as the primary or secondary language. American Sign Language (ASL) is the visual language used within the American Deaf community. [Note: the use of the word Deaf refers to a culture rather than to a degree of hearing loss; individuals in the U.S. who consider themselves Deaf use ASL [Carney and Moeller, 1998]]. ASL is not a signed representation of spoken English. Indeed, ASL is a complete language with a unique set of rules (visual phonology, syntax, semantic, and pragmatic), which differ from the forms used in spoken English. Deaf communities in other countries use other visual languages (e.g., British Sign Language, Australian Sign Language). Speech is not a component of a visual language. Most adults who are deaf, selfidentify as a primary user of either visual or spoken language. Some Deaf adults consider themselves to be bilingual; that is, they use ASL when communicating within the Deaf community and a form of spoken English for interactions with individuals outside of the Deaf community. There are also adults who have profound hearing loss (are deaf in the audiologic sense) who communicate using only spoken language: these individuals do not consider themselves members of the Deaf community. The controversy that has surrounded the use of spoken or visual language by children who are hard of hearing or deaf has impacted education programs for children with hearing loss of all ages within the U.S. Both spoken and visual language approaches over the years have had strong proponents; this has led to the development of separate programs for the training of deaf educators and separate schools/classrooms wherein one philosophy or method of training/educating children who are hard-of-hearing or deaf has been practiced. There are also early intervention programs that specifically use only one communication mode. COMMUNICATION OPTIONS A communication option, mode, modality, or method is the means by which the child and family receive and express language. The choice of a communication modality that facilitates language development and allows the child who is hard of hearing or deaf to readily engage in communication interchanges with family and caregivers is a primary issue throughout childhood [Carney and Moeller, 1998]. As described in this chapter, continued controversy exists over which (if any) of the specific communication options described below is optimal. Frequently, professionals with whom parents are in contact in clinical and educational settings have strong opinions regarding the issue [Tye-Murray, 1998]. While there may be debate regarding specific communication methods, few question the concept that every child who is hard of hearing or deaf needs to develop language early in life and that the child and family need a method to communicate which facilitates natural, meaningful, and abundant interchanges. Existing literature that supports the appropriateness of any one approach is limited. Available studies suffer from one or more confounds that prohibit the generalization of results. Studies of specific communication approaches have historically been limited to reports from one group rather than comparisons between groups using two different approaches, or single-subject research designs [Carney and Moeller, 1998]. Ethical issues preclude the development of randomized clinical trials examining the various approaches. Importantly, because of the recent advent of UNHS, there are very few studies that have examined the outcomes of groups of children over the long term who were identified by UNHS and who received intervention using a specific communication option. Such information could be beneficial to parents in helping them with decisions regarding at least the initial selection of a communication approach, one that meets the needs and goals of the family.

Auditory-Verbal (AV) The Auditory-Verbal (acoupedic; unisensory; auditory; auditory-only) approach has as primary goals (1) the development of spoken language acquired exclusively through the use of aided residual hearing and (2) the complete integration of the child who is hard of hearing or deaf into the community of individuals who use spoken language (Auditory-Verbal International; www. auditory-verbal.org). Consistent (every waking hour) use of amplification or cochlear implant technology is considered requisite for achieving the goals set forth in the approach [Goldberg, 1997]. Audition is stressed so significantly that during language learning activities, the child is not permitted to view the lips or facial expressions of the speaker. AV-trained therapists work directly with families teaching the specifics of the approach. It is expected that the AV approach will be incorporated fully into the home environment and, ideally, in the early intervention setting. Because the goal is complete integration in the mainstream, the child and family are not exposed to Deaf culture or sign language.

The country has witnessed a phenomenal expansion of educational opportunities in the post independence period. Disabled children however have not benefited substantially from this growth. To achieve the goal of education for all, the Government of India has brought education of this group of children for special attention as part of its concern for equalization of education opportunities. The National Policy on Education (NPE 1986) focuses on the needs of children with disabilities. The NPE, 1986 recommends and integrated education in general schools for children with locomotor handicaps and with other mild disabilities, orientation and pre-service training of general teachers to meet special needs of these children, provision of vocational training, establishment of special schools for severely disabled children and encouragement of voluntary organizations in these tasks. The Programme of Action (POA) formulated for implementing the NPE suggested a pragmatic placement principal, it postulated that the child with disabilities who can be educated in a general school should be educated in a general school only and not in a special school. Even those children who are initially admitted to special schools for training in plus curriculum skills should be transferred to general schools once they acquire daily living skills, communication skills and basic academic skills.

In the prevailing conditions there are two types of educational programmes available in India for different categories of handicapped children. That is:

a) Integrated education Programme for children with mild disabilities in a regular school setup under the Scheme of Integrated Education for Disabled Children (IEDC) formulated by the Ministry of Human Resource Development, being implemented through State Council of Educational Research and Training (SCERT) and Non Governmental Organizations (NGO) at State level.

b) Special school programmes for severely disabled children in a special school setup formulated under the Ministry of Social Justice and Empowerment, being implemented through the State Governments, involving the NGO's.

In the present unit we will be discussing about the scheme of integrated education, that is, what IEDC is, how it is implemented, he scope of IEDC, the kind of facilities available for the disabled and what the State level agencies do.

OBJECTIVES

After going through this unit you will be able to:

- State the meaning of IEDC
- Explain the implementation of IEDC
- List the various facilities available for the children
- Differentiate between the procedure for grants to State Governments and voluntary organizations
- Discuss the role of State level agencies

WHAT IS INTEGRATED EDUCATION FOR THE DISABLED CHILDREN (IEDC)

IEDC is a centrally sponsored scheme, which purports to provide educational opportunities for the disabled children in regular schools. It also says that the children who are placed in special schools should also be integrated in regular schools once they have acquired the communication and daily living skills at a functional level. The objective is to integrate the disabled with the general community at all levels as equal partners to prepare them for normal growth and to enable them to face life with courage and confidence.

FUNCTIONING

This scheme is implemented mainly through the State Governments, Union Territories, Administrations and Autonomous organizations of stature having experienced in special education and general education.

Procedure for implementation

IEDC has already been implemented in 27 States and 5 Union Territories, incase another State wants to implement the IED the procedure would be as follows:

For the implementation of IEDC, Administrative Cells have to be setup to –

- Ensure assessment of disabled children
- Organize facilities for disabled children
- Provide special teachers for the children
- Train teachers and other staff in special education
- Remove architectural barriers
- Develop resource room facilities
- Develop Instructional material
- Motivate State Government to relax rules about admission to provide early education to these children

We have till now seen the how the functioning is in administrative terms. Lets see in terms of facilities for the disabled of what the scheme offers.

FACILITIES FOR DISABLED CHILDREN

The facilities can be divided into-

Financial assistance

Financial assistance means that health is given in terms of money. Money is given for various needs like books transport etc. Following is the list of the exact amount for the various requirements.

- Actual expenses on books and stationery upto Rs 400/- per annum
- Actual expenses on uniforms upto Rs 200/- per annum
- Transport allowance upto Rs 50/- per month, if a disabled child admitted under this scheme resides in the hostel of the school within the school premises, no transportation will be provided.
- Reader allowance of Rs 50/- per month incases of blind children after class V.
- Escort allowance for severely handicapped children with lower extremity disabilities @ Rs 75/- per month
- Actual cost of equipment subject to a maximum of Rs 2000/- per student for a period of 5 years
- Where there is no State scheme of scholarships to hosteliers, the disabled children whose parental income does not exceed Rs 5000/- per month, are paid actual board and lodging charges subject to a maximum of Rs 200/- per month. However children are placed in hostel only when educational facilities are not available in schools near their homes.
- In the case of severely orthopaedically handicapped children, it may be necessary to allow one attendant for 10 children in a school
- Lodging and boarding charged should be paid for those students who are residing in the school hostels
- For severely orthopaedically handicapped children living in hostels 'ayah' or helper is allowed, a special pay of Rs 50/- per

month is admissible to any employee of the hostel willing to extend such help to the children.

Manpower assistance

This assistance is in terms of people, what help they can provide:

- Special educators should be appointed for the children with disabilities admitted in general schools
- The special teacher-pupil ratio should be 1:8. In a general school for eight children with disabilities, one resource teacher will be appointed
- The primary teachers should have Secondary Educational Qualifications (10+2) with one-year course in education of children with the particular disability. Secondary teachers should be graduates with B.Ed (special education) with specialization in a particular disability.
- The facilities for the training of special teachers are available in Regional Colleges of Education, Regional Training Centers being run by the National Institutes for the Handicapped, Special Education Departments in the Universities and in Selected Colleges of Education
- For administrators, heads of the institutions and general teachers associated with the implementation of the scheme, short orientation courses should be organized. It can be done by NCERT, State Government/ Union Territories. The expenditure should be borne by the State Government/ Union Territories administrations concerned.

Instructional assistance

Instructional assistance is the help provided by the school.

- Financial assistance is given for production/purchase of instructional materials for the disabled.
- Alternative modes of examination for blind and other children is provided
- Removal of architectural barriers, or to modify existing architectural barriers so as to provide easier access to disabled children. A grant for this purpose is available to schools having ten handicapped children
- A resource room having all the essential equipment, learning aids and materials is provided for a cluster of schools implementing the scheme. In case no room is provided in the school a new room can be constructed. Grant upto Rs 40,000/- is available from the State Government. The NCERT has a handbook which indicates the type of facilities which may be provided in the resource room
- State Government should have regulations for relaxation of rules relating to admission, promotion, examination procedures etc. for improving the access of the disabled children to education. Provision for education of disabled children older than the normal eligibility limit (8-9 years instead of 6 years) is possible

Procedure for grants

For both State Government administration and for voluntary organization after they submit their proposal regarding 1) utilization of grants 2) staff, programmes both existing and new, 50% of the grant of the approved grant for the year is released as first installment, the remaining 50% of the grant will be sanctioned as soon as the State administration or voluntary organization reports utilization of atleast 75% of the grant sanctioned earlier.

EFFECTIVENESS OF THE IEDC

Despite 100% financial assistance to States in addition to other added facilities such as setting up of the assessment room, resource room etc. The implementation in States was not very effective. The scheme was revised in 1987. The NCERT in 1987 implemented a Project Integrated Education for Disabled (PIED) with the financial assistance from UNICEF in order to mobilize general education system. PIED was designed to strengthen the implementation of the IEDC within the framework and goals of the MPE, that is it emphasized increased enrollment and improved retention of differently abled children in general schools. In the light of successful experience of the PIED in the ten demonstration sites, IEDC was revised in 1992 and now IEDC is being implemented in 27 States and 5 Union Territories through over 22,000 schools benefiting more than 95,000 disabled children. Two polytechnics for disabled students have been setup at Mysore and Kanpur.

Scope of IEDC

IEDC provides educational facilities for the following types of disabled children –

- Children with locomotor handicap (orthopaedically handicapped)
- Mild and moderately hearing impaired
- Partially sighted children
- Mentally handicapped, educable group – IQ 50-70
- Children with multiple handicap (blind and orthopedic, visual impairment and mild hearing handicap)
- Children with learning disabilities

ROLE OF STATE AGENCIES (DPEP)

The discussion so far has been about IEDC- what it is and what facilities are offered. Let us now see what is the role of State agencies for the implementation of the IEDC.

District Primary Education Programme (DPEP)

In 1992 the Central Advisory Board on Education (CABE) completed a revision on the national policy on Education calling for an integrated approach to primary education development focused on the district level. The result has been primary education Programme, the most intensive effort by the central Government to increase enrollment, retention and achievement in primary education.

The DPEP was launched in 1994 to achieve the objectives of Universalization of Primary Education (UPE). The programme takes a holistic view of primary education development and seeks to operationalize the strategy UPE, through district specific planning with emphasis on decentralized management, participatory process, empowerment and capacity building at all levels.

The programmes new initiative is providing integrated education to disabled children so, it's important that we know the functioning of DPEP.

Kind of Scheme

DPEP is a centrally sponsored scheme, 85% of the project cost is shared by the Government of India and 15% by the concerned State Government. Both the Central share and State share are passed on to the State implementation societies directly as Grants. The Government of India Share is resourced by external funding such as western Governments, World Bank, UN organizations etc.

The thrusts of DPEP are:

- Decentralization
- Improved pedagogy through localization of the curriculum and teacher training programmes

- Active improvement of index of gender equity (a measure of enrollment of girls) and index of social equity (a measure of enrollment of schedule castes and schedule tribes)

Objectives of DPEP

The programme aims at providing access to primary education to all children, reducing primary dropout rates to less than 10%, that is ensuring retention, increasing learning achievement of primary school students by 25% and reducing the gender and age gap to less than 5% that is ensuring enrollment.

The programme is structured to provide additional inputs over and above the central/State sector schemes for elementary education programmes filling the existing gaps in the development of primary education. It seeks to revitalize the existing system.

The programme components include construction of classrooms and new schools, opening of non formal/ alternative schooling centers, appointment of new teachers, setting up of early childhood education centers, strengthening of State council of educational research and training (SCERT)/ district institutions of educational training (DIET's).

A new initiative in providing distance education for teachers training has also been incorporated

Efficacy of the scheme

The programme was launched in 42 Districts of 7 States in 1994, now it covers a total of 219 Districts in 15 States namely Assam, Haryana, Karnataka, Himachal Pradesh, Kerla, Tamilnadu, Madhya Pradesh, Guajrat, Orissa, Andhra Pradesh, West Bengal, Uttar Pradesh, Rajhastan and Bihar. Further expansion of DPEP in 9 districts of Rajhastan, 8 Districts of Orissa and 6 districts of Gujarat are in the pipeline.

SUMMARY

IEDC was started with the objective of providing educational opportunities to children with disabilities under the general school system so as to facilitate their inclusion.

Under the scheme 100% financial assistance is provided to the States and Non Governmental Organizations. Assistance is also provided for setting up resource centers, surveys and assessment of disabled children, purchase and production of instructional material and training and orientation of teachers. It is being implemented in 27 States and 5 Union Territories.

CHECK YOUR PROGRESS

How did the scheme IEDC come up?

- Explain the purpose of IEDC.
- Once the State Government decides to implement the IEDC, what are the steps taken to ensure implementation?
- What are the facilities available for the orthopaedically handicapped?
- What are the instructional facilities to the disabled children?
- How can DPEP help in the implementation of IEDC?

POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to haved further Clarification and Discussion on some Points.

Points for discussion

Points for clarification

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UNIT 4: ISSUES & MEASURES IN LITERACY DEVELOPMENT AND SCHOLASTIC ACHIEVEMENT OF STUDENTS WITH HEARING LOSS

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

The dominating feature in the history of Disabled people has always been in their isolation and exclusion the long march towards integration and participation started many years ago.

On 25th September 1985 the Central Government constituted a new Ministry of Welfare by bringing the subject of handicapped welfare under one of its 5 bureaus. The centre is responsible for formulating welfare policies and programs apart from co-ordinating guiding or promoting implementation of welfare services by State Government.

The Ministry of Social Justice and Empowerment is the nodal ministry for all policies / issues relating to the welfare of persons with disabilities.

According to the National Association of Educational Progress ("National assessment of," 2014) to be a proficient reader, a student must be able to read at grade level and also be able to synthesize, explain, and analyze what he/she read (i.e., comprehend and make reasonable inferences of written material). Reading is related to cognitive development, language development, and emotional development. Reading is a fundamental skill necessary to function successfully in today's society (Kirsch, Jungeblut, Jenkins & Kolstad, 2002). Reading comprehension aids in the development of ideas, exploration of new knowledge, and the exchange of information. The ability to comprehend written language is a greater framework that stems from the development of literacy skills by the time students reach their school age years.

Literacy is often viewed as emerging from a child's oral language development. The linguistics approach to language development is formed on the notion that children do not need to be taught directly how to speak; language development and its pragmatics are learned from conversations near children indirectly. Expressive language acquisition then forms the foundation for written language comprehension as the ability to decipher the common phonemic sound system of language is enhanced. This underlying principle of connecting sound to print relies upon the established knowledge of the spoken language in order to aid in the reading process. Unfortunately, children with severe to profound hearing impairment are placed at a disadvantage by not having complete access in developing the ability to deduce the phonemic sound system. With 90% of children with severe-profound hearing impairment being born to adults with normal hearing ("National deaf children's," 2014, the majority of children do not 2 develop adequate understanding of any language modality—whether it be oral communication, sign language, or cued speech/lip-reading to assist in the process of comprehending written language. Children born with severe-profound hearing impairment may fail to develop a fluent system of communication as well as fail to develop phonemic decoding abilities necessary to become proficient readers. Kyle and Harris (2010) found that children with normal hearing and children with severe-profound hearing impairment utilize slightly different reading strategies over the first 2 years of schooling. Despite both groups of children exhibiting similar levels of reading progress in the early stages of reading development, their reading trajectories diverged after the second year of reading instruction. Reading delays in beginning readers with severeprofound hearing impairment were not as severe as that typically observed with older children with severe-profound hearing impairment; however, the severity of delay increased with age (Kyle & Harris 2010). For more than fifty years, students with severe-profound hearing impairment have consistently displayed poor reading comprehension abilities. The average student with severeprofound hearing impairment leaves high school scoring the same reading level as that of third or fourth grade student. Researchers and educators consider what factors contribute to the failure of children with severe-profound hearing impairment to advance in reading comprehension. An investigation of current literature reveals conflicting reports as to how literacy skills are developed in children who are both deaf and hard of hearing. Research suggests that readers with normal hearing decode words in two ways (Goff, Pratt & Ong, 2005). They depend upon the sound-based relationship between the letters of a word and the sound that corresponds with each letter. This is the basis of phonological skills also referred to as sounding out a word. This approach allows children to read words that they have 3 not seen in print before. The second approach, or lexical approach, depends on whole word recognition (Goff, Pratt & Ong, 2005). Also known as print-based reading, this approach works with words that do not follow phonological rules but require that the child has had previous exposure to the word in its printed form. The general assumption is that children with normal hearing use the phonological approach for unfamiliar words and the lexical approach for familiar words (Goff, Pratt & Ong, 2005). A clear foundation has been established for how children with normal hearing learn to read and therefore any impairment can be assessed, evaluated, and rehabilitated according to these standards. However, there is no agreed standard that can be applied to children who are deaf or hard of hearing. In comparison to other learning disabilities, researchers in the field of deaf education argue that there is a lack of research addressing the quality of educational opportunities specifically in the realm of progress in reading achievement (Luckner & Handley 2008). With the lack of research, evidence based practice is limited along with the knowledge of strategies to provide intervention. The purpose of this paper is to identify the major problematic areas in reading comprehension within the school aged (6-11 years old) population of children who are deaf or hard of hearing. This review of the literature seeks to discover which aspects of literacy are the most challenging to children with severe to profound hearing impairment. In addition, it seeks to determine if this population follows the same patterns of reading predictors as do children with normal hearing as well as to identify common trends of reading skills based upon degree of hearing loss, and to recognize the relationship of reading skills to other developmental factors (i.e., first language acquisition, primary mode of communication, and type of amplification).

Because this population cannot rely solely on hearing sensitivity to aid in reading, it is reasonable to assume that they will not follow the same pattern of reading predictors (Kyle & Harris 2010). Research supports memory, spelling, vocabulary, grammatical knowledge, and other cognitive and language based skills as evidence for reading predictors in children (Goff, Pratt & Ong, 2005). Research is inconsistent in determining predictors of reading success in students who are deaf or hard of hearing. However, studies have contributed information toward the understanding of the reading acquisition process by identifying factors that appear to impact reading success. The most prominent of these is phonological awareness or the ability to access and manipulate speech sounds (Harris & Beech 1998). Phonological awareness has been shown to be a strong predictor of reading outcomes (Weinrich & Fay 2007). Another factor is a student's orthographic processing skill. There is increasing evidence of a relationship between orthographic processing skill and reading ability (Deacon, Benere, & Castles, 2012). Orthographic dependence or knowledge is a key area that many researchers propose is a foundational skill and predictor of reading ability in students who are deaf or hard of hearing (Miller 2005). According to the American Speech-Language Hearing Association (ASHA, 2011), orthographic knowledge refers to the information that is stored in memory that informs us of how to represent spoken language in written form. Orthographic knowledge depends upon the understanding of both mental grapheme representations and orthographic rules of a language (Apel, 2011). Mental grapheme representation utilizes stored mental representations of specific written words or word parts. Orthographic rules are the laws that govern how speech must be represented in writing (Apel, 2011). 5 Paul Miller (2006) conducted a study to determine the nature and efficiency of the strategies used by individuals with prelingual deafness for the recognition of written words with reference to an orthographic self-teaching concept. Each participant was asked to make categorical judgments for real words and pseudo homophones of the real words. Pseudo homophones are considered words that are phonetically identical to a word. Participants were native signers between seventh and tenth grade. Participants met the criterion of hereditary deafness and had parents who were deaf. Due to the low prevalence of hereditary deafness, students were chosen from different grade levels. The findings of the study showed that the participants with deafness were impaired in their phonological decoding abilities; however, their efficiency in recognizing and categorizing written words was similar to that of their peers with normal hearing. The finding suggests that these students developed strategies for the acquisition of orthographic knowledge which does not rely on phonology (Miller, 2006). These findings are consistent with the author's previous study in 1997. In studying the effects of communication mode on the development of phonemic awareness in students with prelingual deafness, Miller (1997) found that older children performed above chance level on a picture rhyme-matching task involving both orthographically congruent and incongruent items. Their performance was similar to that of their peers with normal hearing only when items were orthographically congruent. Many other authors suggested that adolescents and children with deafness are heavily influenced by or rely upon orthography when making judgments of phonological similarity. Other research proposes that phonological awareness remains a major predictor in reading abilities in both children with normal hearing and in children with severe-profound hearing impairment. Harris and Beech (1998) studied implicit phonological awareness and early reading development in children with prelingual deafness. A group of students with severe- 6 profound hearing impairment were participants in their longitudinal study of reading progress as compared with a hearing control group. The students began the study when they were 5 years of age and were pre-readers. The authors controlled for IQ scores between the groups. The children with severe-profound hearing impairment varied considerably on implicit phonological awareness, oral ability, and familiarity with sign language and fingerspelling measures. This group also made significantly less reading progress than their peers with normal hearing during the first year of schooling. In addition, they scored significantly lower on the test of rime and onset awareness (Harris & Beech 1998).

A comprehensive law, namely persons with disabilities (Equal opportunities protection of Rights and full participation) Act, 1995, has been enacted and enforced in February 1996. The law deals with both prevention and promotional aspect of the rehabilitation such as education, employment and vocational training, creating of barrier free environment, provision of rehabilitation services for persons with disabilities, institutional services and supportive social security measures like unemployment allowance & a greivance & redressable machinery both at the Central & State level. The Act provides that the government shall ensure that every child with disability has access to free education in an appropriate environment till the age of 18 years.

In consonance with the policy of providing a complete package of welfare services to the physically and mentally disabled individuals and groups and in order to deal with the multi dimensional problems of the disabled person, National Institutes / Apex level institutes have been set up in each major area of disabilities.

OBJECTIVES

After going through this unit you will be able to –

- List the National Institutes and schools according to disability.
- Explain the facilities available in the National institutes for identification, education and vocation of the disabled population.

- Make use of the contributions of the institutes by disseminating information to the masses.
- To be equipped to guide the disabled students for the appropriate placement.

We need to know which are the National Institutes and what services they are offering to the disabled. Let's begin with the names and location of the National Institutes.

NATIONAL INSTITUTES OF DISABILITIES

The six main institutes are spread across the country and are –

- National Institute for the Visually Handicapped, (NIVH), Dehradun.
- National Institute for Orthopaedically Handicapped, (NIOH), Calcutta.
- National Institute for Rehabilitation Training and Research (NIRTAR), Olatur, Cuttack.
- The Institute for the Physically Handicapped, (IPH), New Delhi.
- Ali Yavar Jung National Institute for the Hearing Handicapped (AYJNIHH), Mumbai.
- National Institute for the Mentally Handicapped, (NIMH), Secunderabad.

Let us now know what each institute has to offer what is objectives are so that as teachers you will be able to guide the disabled children to the appropriate centre.

National Institute for the Visually Handicapped, (NIVH), Dehradun

The National Institute for the Visually Handicapped (NIVH), Dehradun, was established in July, 1979. It is a registered society under the Ministry of Social and Women's Welfare.

The objectives of the institute are –

- To promote research.
- To undertake the training of personnel
- To provide certain national level services.

The Institute have the following division

(1) School Division

(2) Training Division

(3) Aids and Appliances Division

(4) Research Division

(5) Book Division

(6) Industrial Psychology Division

The Institutes activites include operating school for the blind, imparting occupational training, running of a sheltered workshop, a braille press, a teacher's training centre and conducting research on several aspects of blindness.

The Institute operates two schools – one each for the blind and for the partially sighted children. The school prepare the blind children for the secondary examination.

For the adult blind persons occupational training in handicrafts, braille typewriting, braille shorthand, music, book binding, radio engineering is provided by the training centre for the Adult Blind.

NIVH has four teacher's training centre which offers a one year diploma course through a common All India Examination.

The Institute has a central braille press which produces braille literature in Hindi and English. UNICEF has provided funds to the press for printing or producing braille text books upto Class VI for free distribution. The library of the institute circulates braille books free of charge to blind readers all over the country.

There is also a workshop where various aids and appliances the braille slate, arithmetic slate, plastic styles, chess board, playing cards, pocket frame, folding stick, braille scale etc. are produced at low cost in the workshop.

The institute has a sheltered workshop and units for rural expansion programmes, management for newly blinded, home management, guidance and counselling, orientation & mobility services.

The courses run by NIVH are –

- Diploma in teaching the Blind.
- Contact cum correspondence courses for Inservice Teachers of the Blind.
- Diploma course for Secondary Teachers of Visually Handicapped.
- Training course for Primary School Teachers of Visually Handicapped.
- B.Sc. (Hons) in Physiotherapy
- B.Sc. (Hons) in Occupational Therapy
- Two Years Diploma Course in Orthotics & Prosthetics.

National Institutes for the Orthopaedic Handicap, (NIOH), Calcutta.

For promoting, education training and rehabilitation of the Orthopaedically handicapped children and adults suffering from a wide range of disabilities which limit their mobility, muscular co-ordination and manipulating ability, the NIOH was set up at Calcutta. It was registered as an autonomous society in April, 1982.

The objectives of the Institute are –

- To develop manpower for providing services to the orthopaedically handicapped (OH) population, namely, training of Physiotherapist, Occupational therapist, Orthopaedic and Prosthetic Technicians, Employment and Placement Officers, Vocational Counsellors.
- To develop model services for the Orthopaedic Handicapped population in the areas of restorative surgery, aids and appliances, vocational training etc.
- To provide services and special services to the Orthopaedically Handicapped people.

- To conduct and sponsor research into all aspects, related to the total rehabilitation of the Orthopaedically Handicapped.
- To standardise the aids and appliances for the Orthopaedically Handicapped and promote their manufacture and distribution.
- To serve as the Apex Documentation & Information Centre in the area of the Orthopaedically Handicapped.
- To provide consultancy services to the State Governments and voluntary organisations working for the rehabilitation of the Orthopaedically Handicapped.

National Institute for Rehabilitation Training and Research (NIRTAR), Olatur, Cuttack.

This came into existence when National Institute of Prosthetic and Orthotic Training, a Unit of Artificial Limbs Manufacturing Corporation of India established in 1975, was converted into an autonomous body on February 22nd, 1984 under the Ministry of Social Justice and Empowerment.

The objectives of NIRTAR are –

- To sponsor or co-ordinate the training of personnel such as Doctors, Prosthetists, Orthotists, Prosthetic and Orthotic Technicians, Physiotherapists, Occupational Therapists and such other personnel for the rehabilitation of the physically handicapped.
- To conduct, sponsor, co-ordinate or subsidise research on bio medical engineering leading to the effective evaluation of the mobility aids for the Orthopaedically Handicapped or suitable surgical or medical procedures or development of new aids.
- To promote, distribute, subsidise the manufacture of prototype designed aids to promote any aspects of the education and rehabilitation therapy of physically handicapped (PH).
- To develop models of service delivery programs for rehabilitation.

- To undertake vocational training, placement and rehabilitation of the physically handicapped.
- To promote a disseminate information on rehabilitation in India and abroad.
- To undertake any other action in the area of rehabilitation of the physically handicapped.
- All the income is utilised for the fulfilment of above aims and objectives.

A Regional Rehabilitation Training Centre is also attached to this Institute. NIRTAR also runs several courses.

- Diploma in Prosthetic / Orthotic Engineering.
- Degree in Physiotherapy.
- Degree in Occupational Therapy.
- Short term courses also are run for Orthopaedic Surgeons, Physiotherapy Medicine Therapists in rehabilitation.
- Psychologists, teachers, social workers also are provided with orientation course.

The Institute for the Physically Handicapped, (IPH), New Delhi.

The Institute for the Physically Handicapped is an autonomous body, registered under the Societies Registration Act, 1860 and is an apex level institute in the field of man power development for rehabilitation of the physically disabled persons established in the year 1976 by the Government of India, Ministry of Social Justice & Empowerment.

The objectives of the Institutes are –

- Conducting Physiotherapy / Occupational Therapy courses of 3 ½ years each.
- Conducting Diploma in Prosthetic / Orthotic Engineering of 2 ½ years duration.
- Running workshop for fabrication or Orthotic and Prosthetic Appliances.

- Operating Physiotherapy, Occupational Therapy and Speech Therapy Outpatient Department Services.
- Running a Special Education School upto primary level for the Orthopaedically Handicapped children and a social and vocational guidance unit.

Ali Yavar Jung National Institute for the Hearing Handicapped (AYJNIHH), Mumbai.

The Institute has been established by the Government of India in 1983. It is named in honour of the Late Ali Yavar Jung (Ex-Governor, Educationist & Humanitarian) in appreciation of his interest in the hearing impaired and as a fructification of his efforts towards establishing the institute. It is an apex institute in the field of rehabilitation in the country.

The objectives of the institutes are –

- Training of manpower to produce a cadre of highly specialised professionals for the services of the hearing impaired. B.Ed. (HI) at Mumbai centre, Diploma in hearing, language and speech at Delhi and Patna Regional centres are conducted.
- To conduct community based research to increase and improve the rehabilitation services and to reach out to larger number of Hearing Impaired persons. Some research is also aimed at evolving modules and diagnostic tests that can be used or replicated by other organisation.
- To develop material for educational training and clinical purposes.

The AYJNIHH has established regional centres at New Delhi, Calcutta & Secunderabad, and some Non Government Organisation collaborated centres at Valakam, Chennai, Allahabad, Bangalore for Diploma Courses under the Rehabilitation Council of India.

In addition to this the Institute runs an Adult deaf training centre at Secunderabad.

AYJNIHH provides comprehensive diagnostic, therapeutic, educational and vocational services to the hearing & speech impaired.

The services which are available are –

(1) Evaluation and diagnosis of hearing
(2) Educational evaluation and guidance.
(3) Selection and fitting of hearing aids and ear moulds.
(4) Psychological evaluation.
(5) Psychotherapy, behaviour therapy and play therapy.
(6) Medical consultation.
(7) Speech and language therapy.
(8) Parent guidance and counselling.
(9) Vocational training and placement.
(10) Referral and follow-up.
(11) Outreach and extension services
(12) Certification of hearing disability.

The courses run by AYJNIHH are D.Ed. (Deaf), B.Ed. (Deaf), B.Sc. (AST), D.C.D.

National Institute for the Mentally Handicapped, (NIMH), Secunderabad.

The NIMH was established in 1984 as an autonomous body under the Ministry of Welfare, Government of India. It serves as an apex body with emphasis on training and research.

The objectives of the institute are –

- To develop appropriate models of care and habilitation for the Mentally Retarded persons appropriate to Indian conditions.
- To develop manpower for delivery of services to the Mentally Handicapped.
- To identify, conduct and co-ordinate research in the area of mental retardation.
- To provide consultancy services to voluntary organisation in the area of Mental Handicapped and to assist them.

- To serve as a documentation and information centre in the area of Mentally Retardation.
- To acquire relevant data, to asses the magnitude, causes, socio-economic factors etc. of Mentally Retarded in the country.
- To promote and stimulate growth of various kind of quality services for persons with Mentally Retardation.

At the institutes head quarters there are six departments namely as medical science, psychology, special education, speech pathology and audiology, information and documentation services and vocational training.

The institute has three regional centres at Mumbai, Calcutta and New Delhi.

The National institute runs preservice, inservice seminars and other training programmes. The other courses are –

(1) Three years Bachelor's Degree Course in Mental Retardation (BMR) at Secunderabad.

(2) Diploma Course in Mental Retardation

(3) Post Graduate Diploma

(4) B.Ed. (Special Education) MR

The institute organises 10-12 short term courses also. Covering areas like – portage, vocational training, behavior modification, media workshop in disability. Apart from this it also holds a national workshop every year to serve as a platform to professionals working in the field of Mental Retardation to exchange information including parent teacher programs.

The institute provides a multi disciplinary team services for helping the Mentally Handicapped persons and their parents. After identifying the needs intervention programs are decided which includes appropriate referrals, providing consultancy to other schools regarding the remediation.

There is also a special school "Karvalambam" kendra which admits 85 Mentally Retarded in the age of 3-16 years. They are grouped into pre-primary, primary, secondary and pre-vocational level.

To reach people living in remote areas the Institute conducts rural camps. The activities include

(1) Screening and Case Detection

(2) Individual assessment and counselling.

(3) Training of parent

(4) Creation of awareness

(5) Reference.

In collaboration with NCERT and Central Institute of Educational Technology, the Institute has produced programmes which are regularly telecast as a part of the school training programs on Doordarshan every alternate Saturday. It is directed towards parents of Mentally Retarded Children and provide instructions for home management of the children.

SCHOOLS FOR THE HANDICAPPED CHILDREN

The knowledge of the National Institutes alone is not sufficient of the education of the children as these institutes are not available everywhere. What is required is the knowledge of the schools available in your neighbourhood where you can refer the children with disabilities for regular and immediate assessment, education and vocational training following are the list of the schools according to the areas of disability.

Schools for the Hearing Impaired

The first time in 1884 Bombay Institution for the deaf & mute in Mumbai was established.

- Calcutta Deaf and Dumb School - It provides education for Deaf Children in Calcutta. It was set up in 1893.
- Clarke school for the Deaf - It provides education to the Hearing Impaired and Mentally Challenged Children in Chennai.
- MGR Higher Secondary School and Home for the Speech and Hearing Impaired – It provides shelter for those with speech and hearing disabilities in Chennai.
- Nilam Patel Bahushrut Foundation – It provides education and then main streaming in regular schools for children with Hearing Impairment in Mumbai.
- Vagdevi – It provides assessment, diagnosis and intervention for children with speech and handicapped in rural areas of Bangalore.
- National Society for Equal Opportunities for the Handicapped (NSEOH) – It provides education, vocational training, work and recreation for all children with hearing impairment in Mumbai.
- ARPAN - It is a diagnostic and development centre for the multiply handicapped - It provides education, rehabilitation for children with Hearing Impairment, Mental Retardation in Baroda.
- Akshar Trust for Hearing Impaired - The trust offers formal school programs, teacher training program, infant program to the hearing impaired in Baroda.
- AIAED – It develops educational opportunities and increases the educational facilities for the Deaf in India and gives free literature to uneducated deaf people in India.
- Nagpurkar Hearing Services – It provides services for rehabilitation of Hearing Impaired population. It provides all types of hearing instruments and the assessment, management of Hearing Impaired is also available.
- Maharashtra Deaf Fellowship of India - It reaches out to the deaf in Maharashtra. The primary focus is on education through schools & hostels for girls in Aurangabad.
- EAR – Education, Audiology and Research Society - It provides education and assessment of the Hearing Impaired in Mumbai.

Schools for the Visually Impaired / Blind

The first centre was set up in July 1943 as Saint Dunstan's Hostel in Dehradun for Indian War Blinded.

- NAB – National Association for the Blind was set up in 1952 in Mumbai and Bangalore - It provides education, socio-economic rehabilitation of Children with Visual Impairment.
- Blind People's Association – It provides education and services for the Blind and Visually Impaired in Ahemdabad.
- Sri Rama Krishna Mission - It provides education for school children who are blind in Coimbatore.
- Faith India - It provides education and other services to children with Visual Impairment in Ernakulam.
- Blind Relief Association - It provides education to Children with Visual Impairment in Delhi.
- Shishu Raksha - It is the Karnataka State Council for Child Welfare in Bangalore.
- Kerala Federation of the Blind - It provides Braille shorthand and computer training, braille transcription aid, mobility and orientation program for the children with visual impairment.
- Victoria Memorail School - It provides education and it is a residential school for children with Visual Impairment in Mumbai.
- Rakum School for the Blind - It runs a free residential school for the Visual Impaired and provides training in reading and writing through braille, mobility training for the Visually Impaired, counselling and guidance also in Bangalore.
- Royal Common Wealth Society for the Blind - It works for the prevention and cure of blindness and rehabilitation of the blind. It gives financial assistance to organise free eye camps in rural areas. It is located in Mumbai.
- Rotary Club of Chandigarh – It is an organisation which helps children with braille in Chandigarh.

Schools for the Mentally Handicapped

The first school mentally retarded was set up in Mumbai in 1944 – Jai Vakeel School - It provides research, education and vocational training to the children with mental retardation.

- In 1954, All India Institutes of Mental Health was established.
- Kamayani School in 1964 was set up for the education and vocational training of the Mentally retarded individuals.
- Model school for Mentally Deficient – It provides educational, pre-vocational and rehabilitation services to students with Mentally Retardation in New Delhi. It has an attached Hostel also.
- Arushi – It provides education & pre-vocational training to children with Mental Retardation and learning disabilities in Mumbai.
- Karvalamban – It provides education for the Mentally Handicapped in Secunderabad.
- Central Institute for Mentally Retarded - It provides education, rehabilitation services to children with Mental Retardation in Trivandrum.
- Spandeen – It provides education to children with Mental Handicap in Baroda.
- MITHRA – Is an organisation providing rehabilitation to the Mentally Retarded in Bangalore.
- Ashalaya Home for the welfare of the Mentally Retarded - It provides vocational, physical and remedial training for children with Mental Retardation in Bangalore.
- Association for Mentally Retarded – "Pragati" is a Special School providing education to children with Mental Handicap in Bangalore.
- St. Camilus Training Centre for education of the Mentally Retarded – It provides education for the Mentally Retarded in Kerala.

- Manjunath Social Welfare Association – It provides career guidance and education to children with Mental Retardation and it is also residential school located in Belgaum.
- Canossa Special School – Three R's and art, craft, are provided to children with Mental Retardation in Mumbai.
- Dilkush Special School – It provides training in self-care, workshops, clinical services etc. to children with Mental Retardation in Mumbai.
- SPJ Sadhana School – It provides education, vocation, pre-vocational training and it also has sheltered workshop in Mumbai.
- Amar Jyoti – It provides education for the Mentally Retarded in Delhi.
- Ernakulam Women's Association - It provides education and vocational training for the Mentally Retarded and Deaf in Cochin.
- Alphons Social Centre - It is a school for Mentally Retarded providing education to the Mentally Retarded students in Ernakulam.

School for the Orthopaedically Handicapped

The schools for the Orthopaedically Handicapped or were set up first in 1947.

- The society of rehabilitation of crippled children – Mumbai. This maintains a Children's Orthopaedic Hospital and provides services for Cerebral Palsy and Polio Children
- Cheshire homes founded in 1948 by Leonard Cheshire. In India it has 19 homes, Bangalore.
- In 1955 Fellowhip of the physically handicapped was set up in Mumbai. It alleviates the suffering of persons having Orthopaedic Handicaps.

- Spastic society of India started in Delhi in 1978 and later in Mumbai, Bangalore offers Education, Speech therapy, Occupational therapy, Physiotherapy to students. It is now known as National Resource Centre for inclusion.
- Society for the education of the crippled in Mumbai offers education for the Orthopaedically Handicapped.
- Life Help Centre for the Handicapped in Adyar, Madras offers Special Education to Orthopaedically Handicapped and Intellectually Disabled Children.
- Educational Organization of Tenali – provides education to Physically Handicapped Children.
- Punarjanman; A Special School – provides education for the physically challenged children in Coimbatore.
- Amar Seva Sangam – Centre for Physically Handicapped - It provides education and rehabilitation to the physically handicapped in Tirunelveli district.
- The J.S.S. Polytechnic for Physically Handicapped - Offers courses on computer science, engineering, architecture and commercial practice for student who are Physically Handicapped or Deaf.
- Destitute Home for children with Physically Handicapped – provides shelter and education for children with Physical Handicap in Mysore.
- Association of the Physically Handicapped – It provides education for children with physical handicap in Belgaum.
- Dada Amar Rehabilitation Centre for Cerebral Palsy – It provides education and rehabilitation to children with Cerebral Palsy in Bangalore.
- Disha – Education for the Disabled – It provides special education, vocational training and rehabilitation of spastic children.
- Rotary Club of Delhi – It is involved in vocational training projects for physically challenged.

- Dr. Ambedkar Institute for Physically Handicapped – It offers courses on engineering, commercial practice for students with Physical Handicap in Kanpur.
- Jyot Charitable Trust – It provides aids and artificial limbs to physically handicapped children in Chandigarh.
- Sanjeevan – It provides education for the Physically Handicapped and Mentally Handicapped in Patna.
- UDAAN for the Disabled - It provides Training, Rehabilitation and Early Medical Intervention with integration the children with Cerebral Palsy, Mental Retardation, etc. in Delhi.

SUMMARY

We can summarise the activities of the National Institutes saying that the thrust areas of the National Institutes are man-power development, development of models of services delivery programs for rehabilitation, reaching services to the unreached through out reach activities and research and development in the area of bio-medical engineering, mental retardation and visual impairment. The schools help in availing of services in the neighbourhood.

CHECK YOUR PROGRESS

- How did the need for National Institutes arise?
- List the National Institutes and explain the objectives of NIMH and NIVH.
- Are NIRTAR and NIOH related in any way?
- Why is it essential to know the services of these institutes for a special educator?.
- How does the knowledge of special school in the various area benefit you as a special educator?

POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to haved further Clarification and Discussion on some Points.

Points for discussion

Points for clarification

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UNIT 5: RESTORING TECHNIQUES USING HUMAN (INTERPRETER) & TECHNOLOGICAL SUPPORT (HEARING DEVICES)

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

The dominating feature in the history of Disabled people has always been in their isolation and exclusion the long march towards integration and participation started many years ago.

On 25th September 1985 the Central Government constituted a new Ministry of Welfare by bringing the subject of handicapped welfare under one of its 5 bureaus. The centre is responsible for formulating welfare policies and programs apart from co-ordinating guiding or promoting implementation of welfare services by State Government.

The Ministry of Social Justice and Empowerment is the nodal ministry for all policies / issues relating to the welfare of persons with disabilities.

Hearing Assistive Technology (HATS) for Children

Are there special considerations for children?

Yes! It is well documented that for children, typical language development, speech development, social skills, and academic achievement depend on the ability to hear. HATS maximize children's hearing and learning capabilities.

FM systems, because of their flexibility, mobility, and sturdiness, are among the most common HATS used with children. FM systems have wide application in educational settings. This is because of the long-recognized benefits that this technology provides in noisy and reverberant child care, preschool, and classroom environments.

Think of where and how your child spends the day. It is then easy to realize how HATS provide benefit in noisy play areas or in acoustically poor classrooms.

Studies have shown that FM systems have the best results when implementation is made early in the amplification-fitting or cochlear implant process. In fact, as a matter of routine, audiologists fitting hearing aids for children make sure the aids are prescribed with:

- "T" (telecoil/telephone) switches
- "M/T" (microphone/telecoil) combination switches
- Direct audio input (DAI) capability that allows connection with assistive listening systems

If you have a child who needs a hearing aid, be sure the device comes with the above features.

What do FM systems do for children in schools?

- They allow the child to hear the teacher's voice at an appropriate and constant intensity level. The sound level is consistent regardless of the distance between the child and the teacher.
- They allow the teacher's voice to be heard more prominently than background noise, such as toys, papers, chairs scraping, whispering, pencils being sharpened, and feet shuffling. This is true even when the background noise is closer to the child than the

teacher's voice. This is referred to as a good signal-to-noise ratio (S/N ratio).

- They allow for self-monitoring of the child's own voice through the conventional hearing aid microphone.
- They allow for the conventional hearing aid microphone to be turned off. This enables the child to concentrate only on the teacher.

Are there other HATS used in schools?

Yes. Children with sensorineural hearing loss receive the most benefit from personal FM systems. However, there are other systems, called sound-field systems, that assist listening for all children in the class. Using this technology, the teacher speaks into a microphone transmitter. The teacher's voice is projected through speakers mounted around the classroom. This arrangement assists in overcoming the problems of distance. However, these systems should not be used in classrooms that have heavy reverberations. For any sound-field system to work effectively, good classroom acoustics are essential.

Sound-field systems have been found to benefit typically hearing children and children with hearing loss, as well as those with other auditory and learning problems. Sound-field systems may help those with:

- Minimal hearing loss
- Conductive hearing loss
- Fluctuating hearing loss associated with otitis media
- Unilateral hearing loss (hearing loss in one ear)
- Central auditory processing disorder
- Learning disabilities
- Developmental delays
- Attention deficits
- Language delays
- Articulation disorders

These systems are also helpful for those learning English as a second language.

Who is qualified to determine if my child needs HATS?

The ability to select, evaluate, fit, and dispense FM systems should be managed by a certified audiologist. Many school districts employ certified audiologists who specialize in educational-setting issues. Their expertise includes the evaluation, selection, procurement, and monitoring of HATS used in schools by children. Furthermore, audiologists guide and instruct teachers, speech-language pathologists, and students in making the best use of HATS.

Is there legislation that supports the provision of HATS to children?
Increased availability and usage of FM systems are due in large measure to legislation that mandates access to technology for persons with hearing and other communication disabilities: the Americans with Disabilities Act (ADA), the Individuals with Disabilities Education Act (IDEA), and Section 504 of the Rehabilitation Act. Under IDEA, consideration of assistive technology for any child with a disability must take place as part of the development of the individualized education program. Each act in some way deals with the issue of access to instruction. Of course, for the child with hearing loss, "access" means being able to hear instruction!

Technology can play a key role in assisting a deaf or hard of hearing person to lead an independent life. Hearing aids are the most common technology used, and essentially they amplify sound.
Other technology may be designed to assist the person with a variety of tasks in different settings, including the home, workplace or community environment. Equally, technology may be designed to assist the person with a variety of needs, from health and safety to recreational needs. Such technology is often referred to as Assistive Technology, and some examples of Assistive Technology are listed below, including an explanation of their use and application.

Assistive Technology in the Home

- Flashing devices, e.g. a doorbell, which alerts the deaf or hard of hearing person that there is someone at the door through a flashing light.

- TV Listening devices, which allow the person with hearing loss to adjust the TV volume independently and to eliminate background noise.
- Amplified telephones, which provide amplified and higher quality sound that assist some people with hearing loss to use the telephone.
- Vibrating pillow pads, which alert people while sleeping. This can include an alarm clock, doorbell or fire alarm.
- It is important for people who use hearing aids during the day to be aware that at night, when they remove their hearing aids, they might not hear an ordinary smoke alarm when they are asleep.

Assistive Technology in the Workplace

- Vibrating pad, which alerts an employee if there is an emergency or they are required to complete another task/job etc.
- Listening devices, which can be used to assist employees with hearing loss during meetings, consultations etc.
- Minicom/Fax/iPhone/Internet based video calls, which assist people with hearing loss to communicate in the workplace and the community in general.

Assistive Technology in the Community

- Induction loops, which are included in all public telephones, in are installed in some public auditoria such as theatres and cinemas, and at some counters/ticket desks etc. An induction loop allows a person with a 'T' switch on their hearing aid to eliminate background noise to assist communication.
- Visual scrolling displays, on public transport, in auditoria and in some public buildings provide accessible information to people with hearing loss.

Many people experience hearing loss gradually, often due to the normal aging process or long exposure to loud noise. Hearing loss can also be a sign of more serious health problems. The following self quiz from the American Academy of Otolaryngology (head and neck surgeons) may help you decide if it's time to see a specialist. Score yourself on each question using this scale: 0 points = never 1 point = occasionally 2 points = half the time 3 points = almost always ❑ I have a problem hearing over the telephone. ❑ I have trouble following the conversation when two or more people are talking at the same time. ❑ People complain that I turn the TV volume too high. ❑ I have to strain to understand conversations. ❑ I miss hearing some common sounds like the phone or doorbell ring. ❑ I have trouble hearing conversations in a noisy background such as a party. ❑ I get confused about where sounds come from. ❑ I misunderstand some words in a sentence and need to ask people to repeat themselves. ❑ I especially have trouble understanding the speech of women and children.

I have worked in noisy environments (such as assembly lines, construction sites, or near jet engines). ❑ Many people I talk to seem to mumble or don't speak clearly. ❑ People get annoyed because I misunderstand what they say. ❑ I misunderstand what others are saying and make inappropriate responses. ❑ I avoid social activities because I cannot hear well and fear I'll make improper replies. ❑ (To be answered by a family member or friend) I think this person has a hearing loss.

Add up your points: 0-5 points means your hearing is fine. No action required. 6+ points suggests that you should see an ear-noseand throat specialist and an audiologist for a hearing test.

If You Have a Hearing Loss SEEK HELP

1. If you've taken the Five Minute Hearing Test on page 1 and scored 6 or more, get a medical evaluation from an ear specialist. He will determine if you have a hearing loss, the cause of the loss, and whether medical or surgical treatment is needed. To find an ear specialist, check the Yellow Pages under "Physicians and Surgeons Otology or Otorhinolaryngology."

2. See a professionally-trained, nationally certified, state licensed audiologist. Your doctor can refer you to one or you can look in the Yellow Pages under "Audiologists." The audiologist will conduct

hearing tests to determine whether to recommend one or two hearing aids and the type of aid that may work best for you. 3. If a hearing aid (or pair of aids) is recommended, the audiologist may be able to order and fit the aid, or will refer you to a hearing aid dealer to order and fit the device. You should ask about an intensive program on how to use your aid effectively.

• You will want to know how to adjust it, how to fit it in your ear, and how to care for and clean it.

• You will want to know what you can expect from the aid. Will you hear sounds clearly? Will background noise intrude? Will sound be the same? 4. Many first-time hearing aid users become discouraged when they find that their new aid doesn't let them hear the way they used to. They blame the hearing aid. A hearing aid cannot restore hearing to normal. However, with help from a professional, it will allow you to make the most of your remaining hearing capability.

3 MAKE EFFORTS TO ADAPT 1. Visit or join a self-help group of persons who experience the same problems. They can provide information, recommendations, and support. They can tell you about services available. 2. Take the initiative to communicate better.

• Explain to the other person that you are hard-ofhearing.

• Give tips on how they can talk to you so you can best understand - for example, getting your attention before starting to speak, always facing you, speaking towards your "good ear", moving away from noisy objects like air conditioners.

• Ask a speaker to rephrase a sentence you're not understanding. Don't pretend to understand.

• Do not allow yourself to withdraw into isolation; this is always a temptation when communication is awkward.

• If you belong to a group, suggest informational programs that can introduce others to the realities of hearing loss. The more people know, the easier it is to work out adjustments in every day communication. 3. Seek out information about assistive devices.

• There are many assistive devices that can help those with mild hearing losses who have not yet been fitted for a hearing aid. Other devices go "beyond the hearing aid."

• For information about devices, contact organizations listed in this guide such as OKAK, Hawaii Centers for Independent Living, or Assistive Technology Resource Centers of Hawaii (ATRC). 4

• Assistive Technology Resource Centers of Hawaii has a library where devices are available for loan. Borrowers can try out a device to help determine if the device works for them.

• Devices are available from places such as Radio Shack and Sprint Relay Hawaii. They can also be ordered from some audiologists, hearing aid dispensers, or from mail order catalogues.

• The following describe some assistive devices available. Telephone Amplifiers - are portable amplifiers which can be slipped over the phone or replacement handsets to increase amplification. TTY - also known as TDD or TT, is a text telephone, a typewriter-like device that relays typed messages over the telephone. Special telephones - are available which not only amplify sounds, but also emphasize the higher frequencies to improve clarity. TV, Radio, Stereo Assistive listening devices - are hard wired or wireless devices used by the person who is hard-ofhearing. Models are available for use with or without a hearing aid. Closed caption decoders - print subtitles on the TV 5 screen for programs which are "closed captioned." As of July 1993, all TVs 13" and larger sold in the United States come with decoders built in. Video stores rent videos with closed captioning. They may be marked "closed captioned" or with the following symbols: A tiny symbol resembling a television screen with a tail. CC in bold letters. Personal Listening Systems These are hard wired or wireless devices which carry sound from the speaker, radio, TV or other source directly to the listener's ear. Some are designed for classroom use, others are helpful in oneto-one conversations. Listening Systems (Auditorium-Type) Many public places have special sound systems for people with hearing impairment. They consist of a transmitting system and an individual receiver. There are AM systems, FM systems, audio loop systems, and infrared (IR) systems. Some systems must be used with a compatible hearing aid. For example, theaters often have assistive listening systems. Someone should call ahead to inquire about the availability and type of listening system possibly offered. Other Devices

• Flashing door bells and smoke alarms

• Vibrating alarm, alarm clock, or pagers
• Telephone signaling systems 6 How to Communicate With Someone Who Is Deaf or Hard-of-Hearing ONE-TO-ONE SITUATION When you communicate with a person who is deaf or hard-of-hearing in a one-to-one situation, you should do the following:

1. Get the person's attention before speaking. First, call out the person's name. If he does not respond, a tap on the shoulder, a wave, a flick of the light switch, or any kind of visual or tactile signal usually does the trick.
2. Begin the conversation with the topic of discussion. If the person knows the subject to be discussed, it is easier for him to follow the conversation.
3. Speak slowly and clearly in a normal fashion. Do not yell, exaggerate, or over-enunciate because exaggeration and overemphasis distort lip movements, making lipreading more difficult.
4. Look directly at the person when speaking. While talking, avoid turning away or walking around. If you must do these things, give the person a cue that you are interrupting the conversation, for example, "Excuse me while I pull your file." Then stop talking until you face the person again.
5. Do not place anything in or near your mouth when speaking. Smoking, gum chewing, and putting your hands or objects in front of your face make it difficult for people to follow what is being said. Mustaches and beards also hide the lips. 7 IN WRITING Always ask a person who is deaf

A comprehensive law, namely persons with disabilities (Equal opportunities protection of Rights and full participation) Act, 1995, has been enacted and enforced in February 1996. The law deals with both prevention and promotional aspect of the rehabilitation such as education, employment and vocational training, creating of barrier free environment, provision of rehabilitation services for persons with disabilities, institutional services and supportive social security measures like unemployment allowance & a greivance & redressable machinery both at the Central & State level. The Act provides that the government shall ensure that every child with disability has access to free education in an appropriate environment till the age of 18 years.

In consonance with the policy of providing a complete package of welfare services to the physically and mentally disabled individuals and groups and in order to deal with the multi dimensional problems of the disabled person, National Institutes / Apex level institutes have been set up in each major area of disabilities.

OBJECTIVES

After going through this unit you will be able to –

- List the National Institutes and schools according to disability.
- Explain the facilities available in the National institutes for identification, education and vocation of the disabled population.
- Make use of the contributions of the institutes by disseminating information to the masses.
- To be equipped to guide the disabled students for the appropriate placement.

We need to know which are the National Institutes and what services they are offering to the disabled. Let's begin with the names and location of the National Institutes.

NATIONAL INSTITUTES OF DISABILITIES

The six main institutes are spread across the country and are –

- ❖ National Institute for the Visually Handicapped, (NIVH), Dehradun.
- ❖ National Institute for Orthopaedically Handicapped, (NIOH), Calcutta.
- ❖ National Institute for Rehabilitation Training and Research (NIRTAR), Olatur, Cuttack.
- ❖ The Institute for the Physically Handicapped, (IPH), New Delhi.
- ❖ Ali Yavar Jung National Institute for the Hearing Handicapped (AYJNIHH), Mumbai.

- National Institute for the Mentally Handicapped, (NIMH), Secunderabad.

Let us now know what each institute has to offer what is objectives are so that as teachers you will be able to guide the disabled children to the appropriate centre.

National Institute for the Visually Handicapped, (NIVH), Dehradun

The National Institute for the Visually Handicapped (NIVH), Dehradun, was established in July, 1979. It is a registered society under the Ministry of Social and Women's Welfare.

The objectives of the institute are –

- To promote research.
- To undertake the training of personnel
- To provide certain national level services.

The Institute have the following division

(7) School Division

(8) Training Division

(9) Aids and Appliances Division

(10) Research Division

(11) Book Division

(12) Industrial Psychology Division

The Institutes activites include operating school for the blind, imparting occupational training, running of a sheltered workshop, a braille press, a teacher's training centre and conducting research on several aspects of blindness.

The Institute operates two schools – one each for the blind and for the partially sighted children. The school prepare the blind children for the secondary examination.

For the adult blind persons occupational training in handicrafts, braille typewriting, braille shorthand, music, book binding, radio engineering is provided by the training centre for the Adult Blind.

NIVH has four teacher's training centre which offers a one year diploma course through a common All India Examination.

The Institute has a central braille press which produces braille literature in Hindi and English. UNICEF has provided funds to the press for printing or producing braille text books upto Class VI for free distribution. The library of the institute circulates braille books free of charge to blind readers all over the country.

There is also a workshop where various aids and appliances the braille slate, arithmetic slate, plastic styles, chess board, playing cards, pocket frame, folding stick, braille scale etc. are produced at low cost in the workshop.

The institute has a sheltered workshop and units for rural expansion programmes, management for newly blinded, home management, guidance and counselling, orientation & mobility services.

The courses run by NIVH are –

- Diploma in teaching the Blind.
- Contact cum correspondence courses for Inservice Teachers of the Blind.
- Diploma course for Secondary Teachers of Visually Handicapped.
- Training course for Primary School Teachers of Visually Handicapped.
- B.Sc. (Hons) in Physiotherapy
- B.Sc. (Hons) in Occupational Therapy
- Two Years Diploma Course in Orthotics & Prosthetics.

National Institutes for the Orthopaedic Handicap, (NIOH), Calcutta.

For promoting, education training and rehabilitation of the Orthopaedically handicapped children and adults suffering from a wide range of disabilities which limit their mobility, muscular co-ordination and manipulating ability, the NIOH was set up at Calcutta. It was registered as an autonomous society in April, 1982.

The objectives of the Institute are –

- To develop manpower for providing services to the orthopaedically handicapped (OH) population, namely, training of Physiotherapist, Occupational therapist, Orthopaedic and Prosthetic Technicians, Employment and Placement Officers, Vocational Counsellors.
- To develop model services for the Orthopaedic Handicapped population in the areas of restorative surgery, aids and appliances, vocational training etc.
- To provide services and special services to the Orthopaedically Handicapped people.
- To conduct and sponsor research into all aspects, related to the total rehabilitation of the Orthopaedically Handicapped.
- To standardise the aids and appliances for the Orthopaedically Handicapped and promote their manufacture and distribution.
- To serve as the Apex Documentation & Information Centre in the area of the Orthopaedically Handicapped.
- To provide consultancy services to the State Governments and voluntary organisations working for the rehabilitation of the Orthopaedically Handicapped.

National Institute for Rehabilitation Training and Research (NIRTAR), Olatur, Cuttack.

This came into existence when National Institute of Prosthetic and Orthotic Training, a Unit of Artificial Limbs Manufacturing Corporation of India established in 1975, was converted into an autonomous body on February 22nd, 1984 under the Ministry of Social Justice and Empowerment.

The objectives of NIRTAR are –

- To sponsor or co-ordinate the training of personnel such as Doctors, Prosthetists, Orthotists, Prosthetic and Orthotic Technicians, Physiotherapists, Occupational Therapists and such other personnel for the rehabilitation of the physically handicapped.
- To conduct, sponsor, co-ordinate or subsidise research on bio medical engineering leading to the effective evaluation of the mobility aids for the Orthopaedically Handicapped or suitable surgical or medical procedures or development of new aids.
- To promote, distribute, subsidise the manufacture of prototype designed aids to promote any aspects of the education and rehabilitation therapy of physically handicapped (PH).
- To develop models of service delivery programs for rehabilitation.
- To undertake vocational training, placement and rehabilitation of the physically handicapped.
- To promote a disseminate information on rehabilitation in India and abroad.
- To undertake any other action in the area of rehabilitation of the physically handicapped.
- All the income is utilised for the fulfilment of above aims and objectives.

A Regional Rehabilitation Training Centre is also attached to this Institute. NIRTAR also runs several courses.

- Diploma in Prosthetic / Orthotic Engineering.
- Degree in Physiotherapy.
- Degree in Occupational Therapy.
- Short term courses also are run for Orthopaedic Surgeons, Physiotherapy Medicine Therapists in rehabilitation.
- Psychologists, teachers, social workers also are provided with orientation course.
-

The Institute for the Physically Handicapped, (IPH), New Delhi.

The Institute for the Physically Handicapped is an autonomous body, registered under the Societies Registration Act, 1860 and is an apex level institute in the field of man power development for rehabilitation of the physically disabled persons established in the year 1976 by the Government of India, Ministry of Social Justice & Empowerment.

The objectives of the Institutes are –

- Conducting Physiotherapy / Occupational Therapy courses of 3 ½ years each.
- Conducting Diploma in Prosthetic / Orthotic Engineering of 2 ½ years duration.
- Running workshop for fabrication or Orthotic and Prosthetic Appliances.
- Operating Physiotherapy, Occupational Therapy and Speech Therapy Outpatient Department Services.
- Running a Special Education School upto primary level for the Orthopaedically Handicapped children and a social and vocational guidance unit.

Ali Yavar Jung National Institute for the Hearing Handicapped (AYJNIHH), Mumbai.

The Institute has been established by the Government of India in 1983. It is named in honour of the Late Ali Yavar Jung (Ex-Governor, Educationist & Humanitarian) in appreciation of his interest in the hearing impaired and as a fructification of his efforts towards establishing the institute. It is an apex institute in the field of rehabilitation in the country.

The objectives of the institutes are –

- Training of manpower to produce a cadre of highly specialised professionals for the services of the hearing impaired. B.Ed. (HI) at Mumbai centre, Diploma in hearing, language and speech at Delhi and Patna Regional centres are conducted.

- To conduct community based research to increase and improve the rehabilitation services and to reach out to larger number of Hearing Impaired persons. Some research is also aimed at evolving modules and diagnostic tests that can be used or replicated by other organisation.
- To develop material for educational training and clinical purposes.

The AYJNIHH has established regional centres at New Delhi, Calcutta & Secunderabad, and some Non Government Organisation collaborated centres at Valakam, Chennai, Allahabad, Bangalore for Diploma Courses under the Rehabilitation Council of India.

In addition to this the Institute runs an Adult deaf training centre at Secunderabad.

AYJNIHH provides comprehensive diagnostic, therapeutic, educational and vocational services to the hearing & speech impaired.

The services which are available are –

(13) Evaluation and diagnosis of hearing

(14) Educational evaluation and guidance.

(15) Selection and fitting of hearing aids and ear moulds.

(16) Psychological evaluation.

(17) Psychotherapy, behaviour therapy and play therapy.

(18) Medical consultation.

(19) Speech and language therapy.

(20) Parent guidance and counselling.

(21) Vocational training and placement.

(22) Referral and follow-up.

(23) Outreach and extension services

(24) Certification of hearing disability.

The courses run by AYJNIHH are D.Ed. (Deaf), B.Ed. (Deaf), B.Sc. (AST), D.C.D.

National Institute for the Mentally Handicapped, (NIMH), Secunderabad.

The NIMH was established in 1984 as an autonomous body under the Ministry of Welfare, Government of India. It serves as an apex body with emphasis on training and research.

The objectives of the institute are –

- To develop appropriate models of care and habilitation for the Mentally Retarded persons appropriate to Indian conditions.
- To develop manpower for delivery of services to the Mentally Handicapped.
- To identify, conduct and co-ordinate research in the area of mental retardation.
- To provide consultancy services to voluntary organisation in the area of Mental Handicapped and to assist them.
- To serve as a documentation and information centre in the area of Mentally Retardation.
- To acquire relevant data, to asses the magnitude, causes, socio-economic factors etc. of Mentally Retarded in the country.
- To promote and stimulate growth of various kind of quality services for persons with Mentally Retardation.

At the institutes head quarters there are six departments namely as medical science, psychology, special education, speech pathology and audiology, information and documentation services and vocational training.

The institute has three regional centres at Mumbai, Calcutta and New Delhi.

The National institute runs preservice, inservice seminars and other training programmes. The other courses are –

(5) Three years Bachelor's Degree Course in Mental Retardation (BMR) at Secunderabad.

(6) Diploma Course in Mental Retardation

(7) Post Graduate Diploma

(8) B.Ed. (Special Education) MR

The institute organises 10-12 short term courses also. Covering areas like – portage, vocational training, behavior modification, media workshop in disability. Apart from this it also holds a national workshop every year to serve as a platform to professionals working in the field of Mental Retardation to exchange information including parent teacher programs.

The institute provides a multi disciplinary team services for helping the Mentally Handicapped persons and their parents. After identifying the needs intervention programs are decided which includes appropriate referrals, providing consultancy to other schools regarding the remediation.

There is also a special school "Karvalambam" kendra which admits 85 Mentally Retarded in the age of 3-16 years. They are grouped into pre-primary, primary, secondary and pre-vocational level.

To reach people living in remote areas the Institute conducts rural camps. The activities include

(6) Screening and Case Detection

(7) Individual assessment and counselling.

(8) Training of parent

(9) Creation of awareness

(10) Reference.

In collaboration with NCERT and Central Institute of Educational Technology, the Institute has produced programmes which are regularly telecast as a part of the school training programs on Doordarshan every alternate Saturday. It is directed towards

parents of Mentally Retarded Children and provide instructions for home management of the children.

SCHOOLS FOR THE HANDICAPPED CHILDREN

The knowledge of the National Institutes alone is not sufficient of the education of the children as these institutes are not available everywhere. What is required is the knowledge of the schools available in your neighbourhood where you can refer the children with disabilities for regular and immediate assessment, education and vocational training following are the list of the schools according to the areas of disability.

Schools for the Hearing Impaired

The first time in 1884 Bombay Institution for the deaf & mute in Mumbai was established.

- Calcutta Deaf and Dumb School - It provides education for Deaf Children in Calcutta. It was set up in 1893.
- Clarke school for the Deaf - It provides education to the Hearing Impaired and Mentally Challenged Children in Chennai.
- MGR Higher Secondary School and Home for the Speech and Hearing Impaired – It provides shelter for those with speech and hearing disabilities in Chennai.
- Nilam Patel Bahushrut Foundation – It provides education and then main streaming in regular schools for children with Hearing Impairment in Mumbai.
- Vagdevi – It provides assessment, diagnosis and intervention for children with speech and handicapped in rural areas of Bangalore.
- National Society for Equal Opportunities for the Handicapped (NSEOH) – It provides education, vocational training, work and recreation for all children with hearing impairment in Mumbai.

- ARPAN - It is a diagnostic and development centre for the multiply handicapped - It provides education, rehabilitation for children with Hearing Impairment, Mental Retardation in Baroda.
- Akshar Trust for Hearing Impaired - The trust offers formal school programs, teacher training program, infant program to the hearing impaired in Baroda.
- AIAED – It develops educational opportunities and increases the educational facilities for the Deaf in India and gives free literature to uneducated deaf people in India.
- Nagpurkar Hearing Services – It provides services for rehabilitation of Hearing Impaired population. It provides all types of hearing instruments and the assessment, management of Hearing Impaired is also available.
- Maharashtra Deaf Fellowship of India - It reaches out to the deaf in Maharashtra. The primary focus is on education through schools & hostels for girls in Aurangabad.
- EAR – Education, Audiology and Research Society - It provides education and assessment of the Hearing Impaired in Mumbai.

Schools for the Visually Impaired / Blind

The first centre was set up in July 1943 as Saint Dunstan's Hostel in Dehradun for Indian War Blinded.

- NAB – National Association for the Blind was set up in 1952 in Mumbai and Bangalore - It provides education, socio-economic rehabilitation of Children with Visual Impairment.
- Blind People's Association – It provides education and services for the Blind and Visually Impaired in Ahemdabad.
- Sri Rama Krishna Mission - It provides education for school children who are blind in Coimbatore.
- Faith India - It provides education and other services to children with Visual Impairment in Ernakulam.
- Blind Relief Association - It provides education to Children with Visual Impairment in Delhi.

- Shishu Raksha - It is the Karnataka State Council for Child Welfare in Bangalore.
- Kerala Federation of the Blind - It provides Braille shorthand and computer training, braille transcription aid, mobility and orientation program for the children with visual impairment.
- Victoria Memorail School - It provides education and it is a residential school for children with Visual Impairment in Mumbai.
- Rakum School for the Blind - It runs a free residential school for the Visual Impaired and provides training in reading and writing through braille, mobility training for the Visually Impaired, counselling and guidance also in Bangalore.
- Royal Common Wealth Society for the Blind - It works for the prevention and cure of blindness and rehabilitation of the blind. It gives financial assistance to organise free eye camps in rural areas. It is located in Mumbai.
- Rotary Club of Chandigarh – It is an organisation which helps children with braille in Chandigarh.

Schools for the Mentally Handicapped

The first school mentally retarded was set up in Mumbai in 1944 – Jai Vakeel School - It provides research, education and vocational training to the children with mental retardation.

- In 1954, All India Institutes of Mental Health was established.
- Kamayani School in 1964 was set up for the education and vocational training of the Mentally retarded individuals.
- Model school for Mentally Deficient – It provides educational, pre-vocational and rehabilitation services to students with Mentally Retardation in New Delhi. It has an attached Hostel also.
- Arushi – It provides education & pre-vocational training to children with Mental Retardation and learning disabilities in Mumbai.

- Karvalamban – It provides education for the Mentally Handicapped in Secunderabad.
- Central Institute for Mentally Retarded - It provides education, rehabilitation services to children with Mental Retardation in Trivandrum.
- Spandeen – It provides education to children with Mental Handicap in Baroda.
- MITHRA – Is an organisation providing rehabilitation to the Mentally Retarded in Bangalore.
- Ashalaya Home for the welfare of the Mentally Retarded - It provides vocational, physical and remedial training for children with Mental Retardation in Bangalore.
- Association for Mentally Retarded – "Pragati" is a Special School providing education to children with Mental Handicap in Bangalore.
- St. Camilus Training Centre for education of the Mentally Retarded – It provides education for the Mentally Retarded in Kerala.
- Manjunath Social Welfare Association – It provides career guidance and education to children with Mental Retardation and it is also residential school located in Belgaum.
- Canossa Special School – Three R's and art, craft, are provided to children with Mental Retardation in Mumbai.
- Dilkush Special School – It provides training in self-care, workshops, clinical services etc. to children with Mental Retardation in Mumbai.
- SPJ Sadhana School – It provides education, vocation, pre-vocational training and it also has sheltered workshop in Mumbai.
- Amar Jyoti – It provides education for the Mentally Retarded in Delhi.
- Ernakulam Women's Association - It provides education and vocational training for the Mentally Retarded and Deaf in Cochin.

- Alphons Social Centre - It is a school for Mentally Retarded providing education to the Mentally Retarded students in Ernakulam.

School for the Orthopaedically Handicapped

The schools for the Orthopaedically Handicapped or were set up first in 1947.

- The society of rehabilitation of crippled children – Mumbai. This maintains a Children's Orthopaedic Hospital and provides services for Cerebral Palsy and Polio Children
- Cheshire homes founded in 1948 by Leonard Cheshire In India it has 19 homes, Bangalore.
- In 1955 Fellowhip of the physically handicapped was set up in Mumbai. It alleviates the suffering of persons having Orthopaedic Handicaps.
- Spastic society of India started in Delhi in 1978 and later in Mumbai, Bangalore offers Education, Speech therapy, Occupational therapy, Physiotherapy to students. It is now known as National Resource Centre for inclusion.
- Society for the education of the crippled in Mumbai offers education for the Orthopaedically Handicapped.
- Life Help Centre for the Handicapped in Adyar, Madras offers Special Education to Orthopaedically Handicapped and Intellectually Disabled Children.
- Educational Organization of Tenali – provides education to Physically Handicapped Children.
- Punarjanman; A Special School – provides education for the physically challenged children in Coimbatore.
- Amar Seva Sangam – Centre for Physically Handicapped - It provides education and rehabilitation to the physically handicapped in Tirunelveli district.
- The J.S.S. Polytechnic for Physically Handicapped - Offers courses on computer science, engineering, architecture and

commercial practice for student who are Physically Handicapped or Deaf.

- Destitute Home for children with Physically Handicapped – provides shelter and education for children with Physical Handicap in Mysore.
- Association of the Physically Handicapped – It provides education for children with physical handicap in Belgaum.
- Dada Amar Rehabilitation Centre for Cerebral Palsy – It provides education and rehabilitation to children with Cerebral Palsy in Bangalore.
- Disha – Education for the Disabled – It provides special education, vocational training and rehabilitation of spastic children.
- Rotary Club of Delhi – It is involved in vocational training projects for physically challenged.
- Dr. Ambedkar Institute for Physically Handicapped – It offers courses on engineering, commercial practice for students with Physical Handicap in Kanpur.
- Jyot Charitable Trust – It provides aids and artificial limbs to physically handicapped children in Chandigarh.
- Sanjeevan – It provides education for the Physically Handicapped and Mentally Handicapped in Patna.
- UDAAN for the Disabled - It provides Training, Rehabilitation and Early Medical Intervention with integration the children with Cerebral Palsy, Mental Retardation, etc. in Delhi.

SUMMARY

We can summarise the activities of the National Institutes saying that the thrust areas of the National Institutes are man-power development, development of models of services delivery programs for rehabilitation, reaching services to the unreached through out reach activities and research and development in the area of bio-medical engineering, mental retardation and visual impairment. The schools help in availing of services in the neighbourhood.

CHECK YOUR PROGRESS

- How did the need for National Institutes arise?
- List the National Institutes and explain the objectives of NIMH and NIVH.
- Are NIRTAR and NIOH related in any way?
- Why is it essential to know the services of these institutes for a special educator?.
- How does the knowledge of special school in the various area benefit you as a special educator?

POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to haved further Clarification and Discussion on some Points.

Points for discussion

Points for clarification

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BLOCK-3: VISUAL IMPAIRMENT--NATURE AND ASSESSMENT

UNIT – 1 : PROCESS OF SEEING AND COMMON EYE DISORDERS IN INDIA

STRUCTURE

Introduction

Objectives

Definitions

Summary

Revision

Assignment/Activity

Points For Discussion And Clarification

References / Further Readings

INTRODUCTION

There is a kind of perception that takes place as our brains decide what it is we are actually seeing. You can actually watch this process of settling upon the right image if you look for it. It is especially pronounced if the brain can't immediately decide what it's viewing. For example, if you see something in the distance you can't quite make out. The gestalt changes from image to image until the brain is satisfied that it is the correct one. Try to catch it sometime. Today, for example, I saw a man with three arms driving toward me. Perhaps it was that he had a cellphone stuck in his ear. Perhaps I had been thinking about a hydra. Who knows? In any case, we see what we have been taught to see. That is, the process of seeing is learned from the time we are infants, [illegible] basically why all of us see the same things, and why anyone who doesn't is considered crazy. Artists have long played on the edge of perceptions that are not readily available to the rest of us. Impressionism is a good example. These artists realized that light affected color and form in unimaginable ways (at that point in the history of art), and painted impressionistic scenes so the rest of us could also see them. Of course, now most of us do, if we allow ourselves to. This really is the essential point—allowing ourselves to. We are much more resilient and stable than we imagine. We can all handle more uncertainty than we imagine. Just because we see or think something out of the ordinary does not mean we're insane. It's a normal part of perception.

Eyesight is one of the most precious gifts that nature has given to mankind. It's only because of the eyes; one can enjoy the beauty of this world. It's impossible to imagine life without sight. Though a very small part of body, eye is one of the most complex human organs. It has various parts, all of which are responsible for normal vision. Smallest structural or functional alteration in the functioning of an eye can cause tremendous visual disturbances.

Refractive error or need of glasses is one of the most common eye problems. It can start at any age. This is due to alteration in length, shape & / or capacity of eyes. There are various types of refractive errors which can be checked by an expert eye specialist & accordingly glasses can be used to improve clarity of vision. Other option for glasses is Contact Lenses. Glasses can be removed completely by a LASER procedure called LASIK after the age of 18 years once the power of eye is stabilized. LASIK is a very safe procedure with high grade accuracy, least possible side effects & excellent results. As refractive error can arise at any age, one eye check up by an eye specialist is must for each & every child at the age of 5 years irrespective whether he is having eye problems or not.

Glasses can be removed by LASER procedure called LASIK after the age of 18

Cataract is another most common eye problem which is nothing but clouding of natural human lens. It's not a disease but normal aging process. Hence it's seen in old age commonly though it can occur at any age because of various reasons & can be there by birth also. Cataract affects quality of vision to a great extent. The only treatment for this is surgery. Cataract can't be cured by glasses or medicines. Due to advances in technology, the entire surgery can be done through a very small 2.8 mm incision & high quality artificial lens is implanted in the eye. Its day care procedure, no hospitalization is required & patient can go home immediately after surgery.

<u>Cataract has to be removed by advanced cataract surgery (Phacoemulsification) & replaced by modern intra-ocular lens</u>

Squint or crossed eye is again a very common eye problem. It also can occur at any age & can be treated by glasses, exercises or surgery. Any person or child with squint has to be examined by expert squint specialist as early as possible irrespective of the age of the affected because if not treated in time, it can have severe impact on vision of the affected. Children with squint need special attention by squint specialist.

<u>Squint corrected by surgery</u>

Glaucoma, which is also called as silent thief of eyesight, occurs due to damage of the Optic Nerve. Raised pressure inside the eye is one of the main risk factors for this. This is also seen in old age & if not diagnosed & treated in time can cause gradual & permanent loss of vision. Treatment modalities include eye drops, LASER & surgery.

Though very small part of human body, eye is very important & delicate organ. Most of the diseases affecting eyes can have impact on the vision & hence any symptom of eye problem should be taken seriously & immediately eye check up by an expert eye specialist should be done to avoid vision threatening problems in future.

Why aging may cause problems Just as hair turns gray and skin sags with age, the eyes, too, undergo a metamorphosis as you grow older. Although many of these changes are part of normal aging, some set the stage for more serious eye problems. As eyes age, eyelid muscles weaken and skin becomes thinner and more flaccid. This can cause the upper lid to droop or the lower lid to sag. Eyelashes and eyebrows may lose their lushness and thin out considerably. Tear production also drops off, and the oily film that tears provide decreases as lubricating glands in the conjunctiva and lids fail. These changes can lead to a buildup of mucus, resulting in stickiness, or make the cornea dry, causing irritation or an uncomfortable, gritty sensation in the eye. The conjunctiva turns thinner and more fragile with age and takes on a yellowish tinge from an increase in elastic fibers. The white of your eye (sclera) also assumes a yellow hue from a collection of lipid, or fat, deposits. Calcium may deposit in the sclera, leading to patches of grayish translucency. The exposed conjunctiva between the lids begins to degenerate, and the cornea can develop an opaque white ring around its edge. With time, the crystalline lens hardens and loses its elasticity. This makes it more difficult to focus on near objects, a common condition called presbyopia. You might also find that your night vision grows poorer These changes usually occur simultaneously in both eyes. The Eyes Have It Why and how you see Longwood Seminars, March 6, 2014 Aging can also cause the lens to darken, grow opaque, and in some cases thicken, causing nearsightedness. Clouding of the lens, which is called cataract, usually develops slowly over many years. It may go unnoticed until the cloudiness blocks the central line of sight and impairs vision. Over time, the anterior chamber in each eye may become shallower in some susceptible people—those who have small eyes and are farsighted, for example. This raises the risk for blockage of the aqueous humor drainage system near the iris. The resulting fluid backup may lead to higher pressure inside the eye that damages the optic nerve, a condition known as closed-angle glaucoma. Left untreated, it can cause blindness. Another form of glaucoma, called open-angle glaucoma, occurs when pressure builds up in the eye because of a different problem: the aqueous humor is less able to flow out through the trabecular meshwork and Schlemm's canal. Because glaucoma can silently steal sight before symptoms develop, it is important to have routine eye exams. The aging retina thins and may grow less sensitive because of cell loss, a reduced blood supply, or degeneration. Especially prone to deterioration is the macula; age-related macular degeneration is a serious disease that can steal a person's central vision. Although age-related changes affect everyone, your race affects your risk for specific types of eye disease. In Americans older than 40, the leading cause of blindness in white people is age-related macular degeneration, while in black people it is cataract, and in Hispanic people it is glaucoma (see Figure 3). This probably results from a combination of factors such as genetics, dietary patterns, and access to medical care.

OBJECTIVES

After reading the course unit, you as a students ,should realise the following objectives:

1) understand the meaning and types of assessment.
2) understand the process of assessment.
3) identify behavioural characteristic.of the disabled.
4) understand different types of assessment tools .
5) use assessment for evaluating educational programes.

DEFINITION

Visual perception is the ability to interpret the surrounding environment by processing information that is contained in visible light. The resulting perception is also known as eyesight, sight, or vision (adjectival form: *visual*, *optical*, or *ocular*). The various physiological components involved in vision are referred to collectively as the visual system, and are the focus of much research inpsychology, cognitive science, neuroscience, and molecular biology, collectively referred to as vision science.

The visual system in animals allows individuals to assimilate information from their surroundings. The act of seeing starts when the cornea and then the lens of the eye focuses an image of its surroundings onto a light-sensitive membrane in the back of the eye, called the retina. The retina is actually part of the brain that is isolated to serve as atransducer for the conversion of patterns of light into neuronal signals. The lens of the eye focuses light on the photoreceptive cells of the retina, also known as the rods and cones, which detect the photons of light and respond by producing neural impulses. These signals are processed in a hierarchical fashion by different parts of the brain, from the retina upstream to central ganglia in the brain.
Note that up until now much of the above paragraph could apply to octopi, mollusks, worms, insects and things more primitive; anything

with a more concentrated nervous system and better eyes than say a jellyfish. However, the following applies to mammals generally and birds (in modified form): The retina in these more complex animals sends fibers (the optic nerve) to the lateral geniculate nucleus, to the primary and secondary visual cortex of the brain. Signals from the retina can also travel directly from the retina to thesuperior colliculus.
The perception of objects and the totality of the visual scene is accomplished by the visual association cortex. The visual association cortex combines all sensory information perceived by the striate cortex which contains thousands of modules that are part of modular neural networks. The neurons in the striate cortex send axons to the extrastriate cortex, a region in the visual association cortex that surrounds the striate cortex

There is considerable evidence that face and object recognition are accomplished by distinct systems. For example, prosopagnosic patients show deficits in face, but not object processing, while object agnosic patients (most notably, patient C.K.) show deficits in object processing with spared face processing.[15] Behaviorally, it has been shown that faces, but not objects, are subject to inversion effects, leading to the claim that faces are "special".[15][16] Further, face and object processing recruit distinct neural systems.[17]Notably, some have argued that the apparent specialization of the human brain for face processing does not reflect true domain specificity, but rather a more general process of expert-level discrimination within a given class of stimulus,[18] though this latter claim is the subject of substantial debate.

The major problem with the Gestalt laws (and the Gestalt school generally) is that they are *descriptive* not *explanatory*. For example, one cannot explain how humans see continuous contours by simply stating that the brain "prefers good continuity". Computational models of vision have had more success in explaining visual phenomena and have largely superseded Gestalt theory. More recently, the computational models of visual perception have been developed for Virtual Reality systems—these are closer to real-life situation as they account for motion and activities which are prevalent in the real world.[citation needed] Regarding Gestalt influence on the study of visual perception, Bruce, Green & Georgeson conclude:

The physiological theory of the Gestaltists has fallen by the wayside, leaving us with a set of descriptive principles, but without a model of perceptual processing. Indeed, some of their "laws" of perceptual organisation today sound vague and inadequate. What is meant by a "good" or "simple" shape, for example?[19]

In the 1970s, David Marr developed a multi-level theory of vision, which analyzed the process of vision at different levels of abstraction. In order to focus on the understanding of specific problems in vision, he identified three levels of analysis:

the *computational*, *algorithmic* and *implementational* levels. Many vision scientists, including Tomaso Poggio, have embraced these levels of analysis and employed them to further characterize vision from a computational perspective.[citation needed]

The *computational level* addresses, at a high level of abstraction, the problems that the visual system must overcome. The *algorithmic level* attempts to identify the strategy that may be used to solve these problems. Finally, the *implementational level* attempts to explain how solutions to these problems are realized in neural circuitry.

Marr suggested that it is possible to investigate vision at any of these levels independently. Marr described vision as proceeding from a two-dimensional visual array (on the retina) to a three-dimensional description of the world as output. His stages of vision include:

- A *2D* or *primal sketch* of the scene, based on feature extraction of fundamental components of the scene, including edges, regions, etc. Note the similarity in concept to a pencil sketch drawn quickly by an artist as an impression.

- A *2½ D sketch* of the scene, where textures are acknowledged, etc. Note the similarity in concept to the stage in drawing where an artist highlights or shades areas of a scene, to provide depth.
- A *3 D model*, where the scene is visualized in a continuous, 3-dimensional map

Transduction

Transduction is the process through which energy from environmental stimuli is converted to neural activity for the brain to understand and process. The back of the eye contains three different cell layers: photoreceptor layer, bipolar cell layer and ganglion cell layer. The photoreceptor layer is at the very back and contains rod photoreceptors and cone photoreceptors. Cones are responsible for color perception. There are three different cones: red, green and blue. Rods, are responsible for the perception of objects in low light.[21] Photoreceptors contain within them a special chemical called a photopigment, which are embedded in the membrane of the lamellae; a single human rod contains approximately 10 million of them. The photopigment molecules consist of two parts: an opsin (a protein) and retinal (a lipid).[22] There are 3 specific photopigments (each with their own color) that respond to specific wavelengths of light. When the appropriate wavelength of light hits the photoreceptor, its photopigment splits into two, which sends a message to the bipolar cell layer, which in turn sends a message to the ganglion cells, which then send the information through the optic nerve to the brain. If the appropriate photopigment is not in the proper photoreceptor (for example, a green photopigment inside a red cone), a condition called color vision deficiency will occur.

Opponent process

Transduction involves chemical messages sent from the photoreceptors to the bipolar cells to the ganglion cells. Several photoreceptors may send their information to one ganglion cell. There are two types of ganglion cells: red/green and yellow/blue. These neuron cells consistently fire—even when not stimulated. The brain interprets different colors (and with a lot of information, an image) when the rate of firing of these neurons alters. Red light stimulates the red cone, which in turn stimulates the red/green ganglion cell. Likewise, green light stimulates the green cone, which stimulates the red/green ganglion cell and blue light stimulates the blue cone which stimulates the yellow/blue ganglion cell. The rate of firing of the ganglion cells is increased when it is signaled by one cone and decreased (inhibited) when it is signaled by the other cone. The first color in the name if the ganglion cell is the color that excites it and the second is the color that inhibits it. i.e.: A red cone would excite the red/green ganglion cell and the green cone would inhibit the red/green ganglion cell. This is an opponent process. If the rate of firing of a red/green ganglion cell is increased, the brain would know that the light was red, if the rate was decreased, the brain would know that the color of the light was green

Artificial visual perception

Theories and observations of visual perception have been the main source of inspiration for computer vision (also called machine vision, or computational vision). Special hardware structures and software algorithms provide machines with the capability to interpret the images coming from a camera or a sensor. Artificial Visual Perception has long been used in the industry and is now entering the domains of automotive and robotics

SUMMARY

The eyes are complex organs, with many parts that must work together to produce clear vision. Here is a basic overview of eye anatomy.

Eyes are approximately one inch in diameter. Pads of fat and the surrounding bones of the skull protect them.

The eye has several major components: the cornea, pupil, lens, iris, retina, and sclera. These work together to capture an image and transmit it directly to the brain's occipital lobe via the optic nerve.

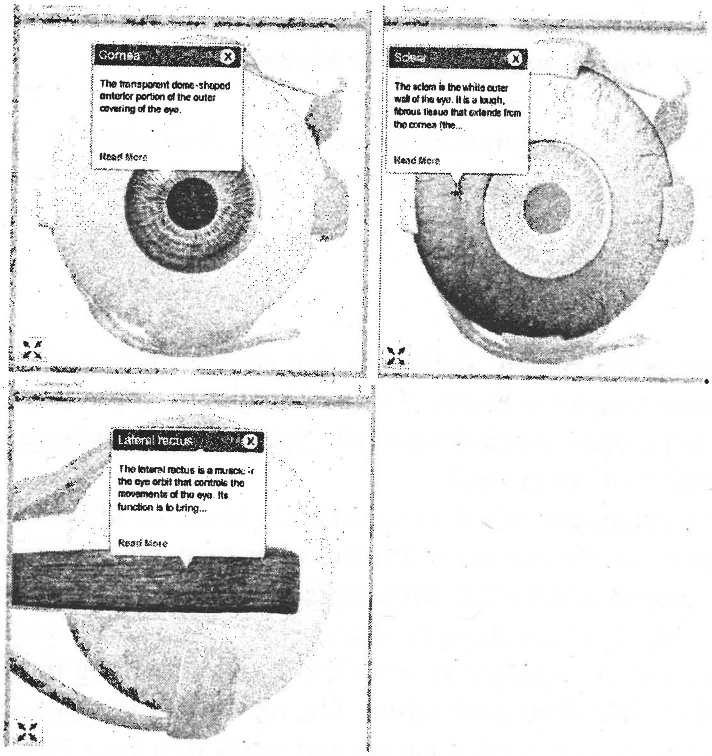
When we look at an object, light reflected from it enters the eye and is **refracted**, or bent. This creates a focused, upside-down image of the object that the brain will have to interpret and turn in the correct direction.

Inside the eye are **photoreceptors**, which create nerve impulses when struck by light. There are two types: **cones** make color vision possible, and **rods** specialize in black-and-white images.

Although our eyes can only see in two dimensions, we are able to determine distances and depth in our three-dimensional world. This is because the brain interprets the two slightly different images our left and right eyes see as one. This is called stereoscopic vision. Other visual cues, such as shadows, how objects are blocking each other, and our knowledge about the sizes of different objects also help us determine depth and distance.

A series of **muscles** helps the eye move. The first set is the superior and inferior rectus muscles, which allow upward and downward motion. The medial and lateral rectus muscles allow the eye to move from side to side while staying level. The superior and inferior oblique muscles let it move up or down and to the side. Most of these muscles are controlled by **the oculomotor nerve.**

Friction from these movements would quickly damage the eye without lubrication. Tears released by the lacrimal gland are spread around by blinking, and provide lubrication for the eye. Tears also help remove foreign objects and bacteria that could cause damage.



Nearsightedness (Myopia)

1. Nearsightedness is a common eye condition in which faraway objects appear blurry.
2. Certain health conditions, such as diabetes, raise your risk of nearsightedness. A family history of nearsightedness also increases your chance of developing it.
3. Nearsightedness can be treated using eyeglasses, contact lenses, corneal refractive therapy, or laser eye surgery.

Nearsightedness is an eye condition in which you can see nearby objects clearly, but faraway objects appear fuzzy or blurry. It's also called myopia.
Nearsightedness is extremely common but treatable. According to the American Optometric Association, almost 30 percent of Americans are nearsighted.

Farsightedness
Farsightedness means it's easy to see things that are far away, but your close-up vision (near vision) is blurry. The technical term for farsightedness is hyperopia. According to the National Eye Institute, it affects 5 to 10 percent of Americans.
To understand farsightedness, it's it's important to understand how the eye works. Two parts of the eye are responsible for focusing: the cornea and the lens. The cornea is the clear front surface of the eye. The lens is a structure inside your eye that changes shape as you focus on objects. The cornea and lens work together to refract, or bend, incoming light. Then they focus that light onto your retina. The retina is at the back of your eyeball. It receives visual information and sends it to your optic nerve. Your optic nerve carries that information to your brain.
A perfectly formed, curved lens and cornea result in a perfectly focused image. If your cornea is too flat, your eye can't focus correctly.
There are varying degrees of farsightedness, depending on the eyes ability to focus on close-up objects. If you can only clearly see objects that are very far away, you're severely farsighted. Generally this is easy to correct.

Astigmatism
Astigmatism is a common vision problem caused by an error in the shape of the cornea. With astigmatism, the lens of the eye or the cornea, which is the front surface of the eye, has an irregular curve. This can change the way light passes, or refracts, to your retina. This causes blurry, fuzzy, or distorted vision. Farsightedness and nearsightedness are two other types of problems with the way light passes to your retina. Farsightedness is called hyperopia. Nearsightedness is called myopia.

The two main types of astigmatism are corneal and lenticular. A corneal astigmatism happens when your cornea is misshapen. A lenticular astigmatism happens when your lens is misshapen.

Conjunctivitis

Conjunctivitis, commonly known as “pink eye,” is an infection or swelling in the outer membrane of your eyeball. Blood vessels in your conjunctiva, a thin membrane that lines part of your eye, become inflamed. This gives your eye the red or pink color that’s commonly associated with conjunctivitis.

Symptoms of Pink Eye

Since bacterial or viral conjunctivitis is very contagious, it’s important to pay attention to your symptoms. The condition can be passed along to others up to two weeks after it develops. Talk with your doctor about treatment if you experience:

- pink- or red-toned eyes
- gritty feeling in your eyes
- watery or thick discharge that builds up on your eyes at night
- itchiness in your eyes
- abnormal amount of tears

The most common causes of pink eye are:

Viruses or Bacteria

Bacterial conjunctivitis is most often caused by the same type of bacteria that cause strep throat and staph infections. Conjunctivitis from a virus, on the other hand, is usually the result of one of the viruses that cause the common cold. Whatever the cause, viral and bacterial pink eye is considered highly contagious. It can spread from one person to another quite easily by hand contact.

Allergies

Allergens, such as pollen, can cause pink eye in one or both of your eyes. They stimulate your body to create more histamines, which cause inflammation as a part of your body’s response to what it thinks is an infection. In turn, this causes allergic conjunctivitis. Allergic conjunctivitis is usually itchy.

Chemicals

You also need to be careful if a foreign substance or chemical splashes into your eyes. Chemicals such as chlorine, found in backyard swimming pools, can cause conjunctivitis. Rinsing your eyes with water is a simple and effective way to keep a chemical irritant from causing pink eye.

How Is Pink Eye Diagnosed?

It's not hard for your doctor to diagnose pink eye. Your doctor will be able to tell if you have pink eye simply by asking you a few questions and looking at your eyes. If necessary, they might take a tear or fluid sample from your conjunctiva and send it to a lab for further analysis.

Treatment for Pink Eye

Treatment of conjunctivitis depends on what's causing it. If your pink eye is the result of a chemical irritant, there's a good chance it will go away on its own in a few days. If it's the result of a bacterium, virus, allergen, there are a few treatment options.

Bacterial Conjunctivitis

For a bacterial infection, antibiotics are the most common method of treatment. Adults usually prefer eye drops. For children, however, ointment might be a better choice because it's easier to apply. With the use of antibiotic medication, your symptoms will probably start to disappear in just a few days.

Viral Conjunctivitis

Unfortunately, if you have viral conjunctivitis, there's no treatment available. Just like the common cold, there are no cures for a virus. Your symptoms will probably go away on their own in seven to 10 days, after the virus has run its course. In the meantime, using a warm compress, or cloth moistened with warm water, can help soothe your symptoms.

Allergic Conjunctivitis

To treat conjunctivitis caused by an allergen, your doctor will probably prescribe an antihistamine to stop the inflammation. Loratadine (e.g., Claritin) and diphenhydramine (e.g., Benadryl) are antihistamines that are available in over-the-counter medications. They may help clear your allergic symptoms, including allergic conjunctivitis. Other treatments include antihistamine eyedrops or anti-inflammatory eyedrops.

General Things to Do

In addition to using a warm compress, you can also purchase eye drops at your local drugstore that mimic your own tears. They will help relieve your conjunctivitis symptoms. It might also be a good idea to stop wearing contact lenses until your case of pink eye completely clears up.

How You Can Prevent Conjunctivitis?

Practicing good hygiene is one of the best ways to avoid and stop the spread of conjunctivitis. Try to avoid touching your eyes with your hands, and wash your hands thoroughly and often. Only use clean tissues and towels to wipe your face and eyes. Make sure that you don't share your cosmetics, especially eyeliner or mascara, with other people. It's also a good idea to wash and change your pillowcases frequently.

If your doctor thinks that your contact lenses are contributing to your pink eye, they may recommend switching to another type of contact lens or disinfection solution. They may suggest cleaning or replacing your contact lenses more frequently, or that you stop wearing contact lenses indefinitely (or at least until your eye heals). Avoiding poorly fitted contact lenses and decorative contact lenses may also decrease your risk of pink eye.

Preventing the Spread of Pink Eye

If you already have pink eye, you can help keep your friends and family safe by washing your hands regularly and not sharing towels or washcloths with them. You should change your towel and washcloth daily, replace your eye cosmetics after your infection clears, and follow your doctor's advice on contact lens care.

If your child has pink eye, it's a good idea to keep them out of school for at least 24 hours after they start treatment to keep them from spreading pink eye to others.

CHECK YOUR PROGRESS

1) Do you believe students with disability ought to participate in standardized testing? If so, what are the major technical difficulties in ensuring appropriate testing of these students? If not. Where do the school personnel draw the line in making decisions about the kinds of students who will participate?

2) How would you identify a visually impaired child?

- What are the different testing techniques used for assessing the visually impaired children?
- What are different areas of assessment?

3) Name the subtypes of learning disabilities?

- What are the various assessment procedures for identifying the learning disabled?
- Prepare a checklist to identify children with learning disability?

4) How would you identify a hearing impaired child?

- What are the testing and assessment procedures for the hearing impaired child?

5) How would you identify a mentally retarded child? List the various testing measures that can be used for identification.

ASSIGNMENT / ACTIVITIES

- Find a journal or textbook that focuses on students with physical disabilities.Find at least three articles that describes specific teaching activities you would like to use to help children with orthopedic impairment to be successful in class.
- Observe a professional ,other than a teacher , who works with children with locomotor impairment Describe what you see and how it relates to classroom instruction.
- To help understand how people with sensory impairment experience the world, try some of these simulations and note your reactions to them: Blindfold yoursewlf and get ready for work..blindfold yourself and let your friend take you around the campus. Watch TV for one hour with the sound turned off. Have a conversation with a friend by using only gestures.
- Imagine that you are the teacher in a classroom with mentally retarded children.What decision will you take to identify and classify them into groups? What assessment measure would you use and in which area? What activities activities would you use to assess and plan an IEP.

POINTS FOR DISCUSSION/CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification on the other. Note down those points.

Points for Discussion

Points for Clarification

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UNIT – 2 : BLINDNESS AND LOW VISION--DEFINITION AND CLASSIFICATION

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Blindness is the inability to see. The leading causes of chronic blindness include cataract, glaucoma, age-related macular degeneration, corneal opacities, diabetic retinopathy, trachoma, and eye conditions in children (e.g. caused by vitamin A deficiency). Age-related blindness is increasing throughout the world, as is blindness due to uncontrolled diabetes. On the other hand, blindness caused by infection is decreasing, as a result of public health action. Three-quarters of all blindness can be prevented or treated.

OBJECTIVES

After reading this course unit you, as a student should realize the following objectives:

- Comprehend the concept of Individualized educational program.
- Understand the components of the individualized educational program.
- Understand and apply the educational implications with respect to Learning Disability. ADD/ADHD, Mental Retardation, Hearing

Impairment, Visual Impairment, and Physically Disabled.

Facts about Low Vision

Most surveys and studies indicate that the majority of people in the United States with vision loss are adults who are not totally blind; instead, they have what is referred to as *low vision*. You may have heard the terms "partial sight" or "partial blindness" also used to describe low vision. Those descriptions are no longer in general use, however.

Here is one definition of low vision, related to *visual acuity*:

- Low vision is a condition caused by eye disease, in which visual acuity is 20/70 or poorer in the better-seeing eye and cannot be corrected or improved with regular eyeglasses. (Scheiman, Scheiman, and Whittaker)

Visual Acuity and Low Vision

Visual acuity is a number that indicates the sharpness or clarity of vision. A visual acuity measurement of 20/70 means that a person with 20/70 vision who is 20 feet from an eye chart sees what a person with unimpaired (or 20/20) vision can see from 70 feet away.

20/70 can best be understood by examining a standard eye testing chart that you may have used in your own doctor's office during an eye examination.

In the United States, the Snellen Eye Chart (pictured left) is a test that ophthalmologistsand optometrists use to measure a person's **distance** visual acuity. It contains rows of letters, numbers, or symbols printed in standardized graded sizes.

Your eye doctor will ask you to read or identify each line or row at a fixed distance (usually 20 feet), although a 10-foot testing distance is also used.

If you can read line 8 (D E F P O T E C) from 20 feet away while wearing your regular glasses or contact lenses, the doctor records your vision (or visual acuity) as **20/20 with best correction**.

If the smallest print you can read is line 3 (T O Z) from 20 feet away while wearing your regular glasses or contact lenses, the doctor records your vision (or visual acuity) as**20/70 with best correction**.

Please note: An actual Snellen Eye Chart is much larger than the one depicted here; therefore, it's not recommended that you use this chart to test your own (or a friend's or family member's) visual acuity.

A Functional Definition of Low Vision

Not all eye care professionals agree with an exclusively numerical (or visual acuity) description of low vision. Here's another – more functional – definition of low vision:

- **Low vision** is uncorrectable vision loss that interferes with daily activities. It is better defined in terms of function, rather than [numerical] test results. (Massof and Lidoff)
- In other words, low vision is "not enough vision to do whatever it is you need to do," which can vary from person to person.
- Most eye care professionals prefer to use the term "low vision" to describe permanently reduced vision that cannot be corrected with regular glasses, contact lenses, medicine, or surgery.
- If you have low vision, it is necessary to have a different kind of eye examination that uses different and more detailed tests to determine what you can and cannot see. You can learn more about these specialized eye charts and testing procedures at What is a Low Vision Examination?

Low Vision vs. Legal Blindness

"Legal blindness" is a definition used by the United States government to determine eligibility for vocational training, rehabilitation, schooling, disability benefits, low vision devices, and tax exemption programs. It's not a *functional low vision definition* and doesn't tell us very much at all about what a person can and cannot see.

Part 1 of the U.S. definition of legal blindness states this about *visual acuity*:

- A visual acuity of 20/200 or less in the better-seeing eye with best conventional correction (meaning with regular glasses or contact lenses). This is a 20/200 visual acuity measurement, correlated with the Snellen Eye Chart (pictured above):
- If you can only read line 1 (the big "E") from 20 feet away while wearing your regular glasses or contact lenses, the doctor records your vision (or visual acuity) as **20/200 with best correction**.

- **Update:** In 2007, the Social Security Administration updated the criteria for measuring legal blindness when usingnewer low vision test charts with lines that can measure visual acuity between 20/100 and 20/200. Under the new criteria, if a person's visual acuity is measured with one of the newer charts, and they cannot read any of the letters on the 20/100 line, they will qualify as legally blind, based on a visual acuity of 20/200 or less.

Part 2 of the U.S. definition of legal blindness states this about *visual field*:

- **OR** a visual field (the total area an individual can see without moving the eyes from side to side) of 20 degrees or less (also called tunnel vision) in the better-seeing eye.

This is a representation of a constricted visual field:

The currently used definition includes the term "best Corrected Vision" in the better eye. The methodology followed for measuring visual acuity, particularly in population based studies, is to use a "pin hole" in patients whose "presenting" vision is below a certain cut off point (currently 6/18). Many recent studies have shown that the use of "best corrected" vision overlooks a large proportion of persons with visual impairment, including blindness, due to uncorrected refractive error, a common occurrence in many parts of the world. Uncorrected refractive error is now considered to be a major cause of visual impairment and estimations are under way to calculate the loss in terms of DALYs (disability-adjusted life years) resulting from this cause. The correction of refractive error is a cost effective intervention and is one of the priorities under the disease control component of the Global Initiative for the Elimination of Avoidable Blindness (VISION 2020, the Right to Sight).

The current ICD uses the words "LOW VISION" for categories 1, 2 and 3 of Vision impairment. In the practice of eye care "LOW VISION" has a specific meaning as defined by WHO. This is as follows: "A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degree from the point of fixation, but who uses, or is potentially able to use, vision for planning and/or execution of a task. " Under this definition persons who would benefit from low vision care also exist among those who are currently categorized as blind. This has led to miscalculations in the estimation of persons requiring LOW VISION care.

The current definition does not make a distinction between those who have "irreversible" blindness (NO perception of light) and those that have light perception but are still less than 3/60 in the better eye. The management of these two categories is different and categorization based on this would be useful.

The sub categories of H54 have inconsistencies when describing "Monocular vision impairment" and "Monocular Blindness"; the fellow eye in these needs not necessarily to be "normal". To add clarity to the sub-categories it is proposed to replace the current table (ICD - 10th Revision see below).

(1)The words "best corrected" be replaced by "presenting" in a revised definition (2)Delete the term LOW VISION from the current ICD 10 definition to collectively describe categories of visual impairment 1, 2 and 3 (3)Categories as shown in the revised Table.1. (4) The wording in the H54 subcategories be changed as follows in line with the proposed revised categories H54.- Visual impairment including blindness (binocular or monocular) Note: For definition of visual impairment categories see table below. Excludes: amaurosis fugax (G45.3) H54.0 Blindness, binocular Visual impairment categories 3, 4 & 5 H54.1 Severe visual impairment, binocular Visual impairment category 2 H54.2 Moderate visual impairment, binocular Visual impairment category 1 H54.3 Mild or no visual impairment, binocular Visual impairment category 0 H54.4 Blindness, monocular Visual impairment categories 3, 4, 5 in one eye and categories 0, 1, 2

Category	Presenting distance visual acuity Worse than:	Equal to or better than:
Mild or no visual impairment 0		6/18 3/10 (0.3) 20/70
Moderate visual impairment 1	6/18 3/10 (0.3) 20/70	6/60 1/10 (0.1) 20/200
Severe visual impairment 2	6/60 1/10 (0.1) 20/200	3/60 1/20 (0.05) 20/400
Blindness 3	3/60 1/20 (0.05) 20/400	1/60* 1/50 (0.02) 5/300 (20/1200)
Blindness 4	1/60* 1/50 (0.02) 5/300 (20/1200)	Light perception
Blindness 5	No light perception	
9	Undetermined or unspecified	

or 9 in the other eye. H54.5 Severe visual impairment, monocular Visual impairment category 2 in one eye and categories 0, 1 or 9 in other eye H54.6 Moderate visual impairment, monocular Visual impairment category 1 in one eye and categories 0 or 9 in other eye H54.9 Unspecified visual impairment (binocular) Visual impairment category 9 Note: The table below gives a classification of severity of visual impairment recommended by the Resolution of the International Council of Ophthalmology (2002) and the Recommendations of the WHO Consultation on "Development of Standards for Characterization of Vision Loss and Visual Functioning" (Sept 2003) For characterizing visual impairment for codes H54.0 to H54.3, visual acuity should be measured with both eyes open with presenting correction if any. For characterizing visual impairment for codes H54.4 to H54.6, visual acuity should be measured monocularly with presenting correction if any. If the extent of the visual field is taken into account, patients with a visual field of the better eye no greater than 10° in radius around central fixation should be placed under category 3. For monocular blindness (H54.4), this degree of field loss would apply to the affected eye.

DEFINITIONS

In spite of the progress made in surgical techniques in many countries during the last ten years, cataract (47.9%) remains the leading cause of visual impairment in all areas of the world, except for developed countries.

Other main causes of visual impairment in 2002 are glaucoma (12.3%), age-related macular degeneration (AMD) (8.7%), corneal opacities (5.1%), diabetic retinopathy (4.8%), childhood blindness (3.9%), trachoma (3.6%), and onchocerciasis (0.8%). The causes of avoidable visual impairment world wide are all the above except for AMD. In the least-developed countries, and in particular Sub-Saharan Africa, the causes of avoidable blindness are primarily, cataract (50%), glaucoma (15%), corneal opacities (10%), trachoma (6.8%), childhood blindness (5.3%) and onchocerciasis (4%).

Looking at the global distribution of avoidable blindness based on the population in each of the WHO regions, we see the following: South East Asian 28%, Western Pacific 26%, African 16.6%, Eastern Mediterranean 10%, the American 9.6%, and European 9.6%.

In addition to uncorrected refractive errors, these six diseases or groups of diseases which have effective known strategies for their elimination, make up the targets of the WHO Global Initiative to Eliminate Avoidable Blindness, "VISION 2020: The Right to Sight", which aims to eliminate these causes as a public health problem by the year 2020. Cataract, onchocerciasis, and trachoma are the principal diseases for which world strategies and programmes have been developed. For glaucoma, diabetic retinopathy, uncorrected refractive errors, and childhood blindness (except for xerophthalmia), the development of screening and management strategies for use at the primary care level is ongoing at WHO.

SUMMARY

Facts about Low Vision

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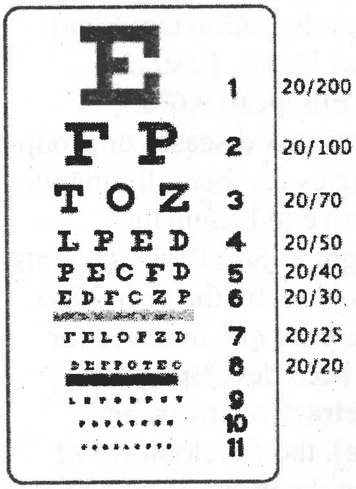

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Visual Impairment

Much like low vision, there are many different definitions of visual impairment. "Visual impairment" is a general term that describes a wide range of visual function, from low vision through total blindness.

Here is an example of the variations in the term "visual impairment" or "visually impaired" from the World Health Organization Levels of Visual Impairment:

Moderate Visual Impairment:

- Snellen visual acuity = 20/70 to 20/160

Severe Visual Impairment:

- Snellen visual acuity = 20/200 to 20/400
- **OR** visual field of 20 degrees or less

Profound Visual Impairment:

- Snellen visual acuity = 20/500 to 20/1000

- **OR** visual field of 10 degrees or less

Like the term "legal blindness," "visual impairment" is not a *functional definition* that tells us very much about what a person can and cannot see. It is a classification system, rather than a definition.

Light Perception and Light Projection

These terms describe the ability to perceive the difference between light and dark, or daylight and nighttime. A person can have severely reduced vision and still be able to determine the difference between light and dark, or the general source and direction of a light.

- The stereotypical assumption – that people who are blind or have low vision live in a type of "blackness" that sighted people see when they close their eyes – is generally not accurate.
- Although every person sees differently, including persons with low vision, an individual who has light perception/projection can perceive the presence or absence of light. Some people describe light perception as knowing when a room light is on or off, or being able to walk toward a lighted lamp on a table in an otherwise darkened room.

Total Blindness

Total blindness is the complete lack of light perception and form perception, and is recorded as "NLP," an abbreviation for "no light perception."

Few people today are totally without sight. In fact, 85% of all individuals with eye disorders have some remaining sight; approximately 15% are totally blind.

Reading with Low Vision Optical Devices

Low vision optical devices can make it possible for you to do various tasks, such as reading, doing crafts, and preparing meals. To help you understand the different types of devices and options that are available, see Reading, Writing, and Vision Loss on this website.

CHECK YOUR PROGRESS

1. What are educational provisions for a locomotor impaired child?
2. What kinds of specific techniques can be used to teach LD children most effectively?
3. What are some of the curricular concerns for teaching ADD/ADHD?
4. What are the various instructional techniques used for helping the retarded children?
5. What are the various educational measures used for helping the retarded child?
6. What is an IEP? What are the various components of the IEP?

ASSIGNMENT / ACTIVITY

1) Interview a classroom teacher. Ask what special methods he / she uses to meet the special needs of exceptional students.
2) Obtain a copy of an IEP. Identify the area of deficit and recommend learning content, generalizing and solving novel problems.
3) Find at least three articles that describe specific teaching activities you could use while teaching the ADD/ADHD children.
4) Consider yourself to be a teacher of the mentally retarded student and specify activities that you would use to develop skills and enhance learning.
5) Volunteer to work with people with sensory disabilities. Participate for at least two hours on five different occasions. Describe how you would provide assistance in the various settings.
6) To help understand how people would sensory disabilities experience the world, try having some of these activities given below and note your Blindfold yourself and get ready to go to college: Blindfold yourself-and move in the classroom you are going to teach, converse with A friend using gestures, give at least ten tips for teachers of students with visual impairment.

7) Imagine that you are a teacher of physically disabled students. What decisions would you make to help the students be more successful? What specific activities would you use to modify a lesson you have to teach in language and geography?

POINTS FOR DISCUSSION/CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification on other. Note down those points.

Points for discussion

Points for clarification

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UNIT – 3: DEMOGRAPHIC INFORMATION--NSSO AND CENSUS 2011

STRUCTURE

Introduction

Objectives

Definitions

Summary

Revision

Assignment/Activity

Points For Discussion And Clarification

References / Further Readings

INTRODUCTION

The **15th Indian Census** was conducted in two phases, house listing and population enumeration. House listing phase began on 1 April 2010 and involved collection of information about all buildings. Information for National Population Register was also collected in the first phase, which will be used to issue a 12-digit unique identification number to all registered Indians by Unique Identification Authority of India. The second population enumeration phase was conducted between 9 to 28 February 2011. Census has been conducted in India since 1872 and 2011 marks the first time biometric information was collected. According to the provisional reports released on 31 March 2011, the Indian population increased to 1.21 billion with a decadal growth of 17.64%.[2] Adult literacy rate increased to 74.04% with a decadal growth of 9.21%. The motto of census 2011 was 'Our Census, Our future'.

Spread across 29 states and 7 union territories, the census covered 640 districts, 5,767 tehsils, 7,933 towns and more than 600,000 villages. A total of 2.7 million officials visited households in 7,933 towns and 600,000 villages, classifying the population according to gender,

religion, education and occupation.[3] The cost of the exercise was approximately □2200 crore (US$330 million) – this comes to less than $0.50 per person, well below the estimated world average of $4.60 per person.[3] Conducted every 10 years, this census faced big challenges considering India's vast area and diversity of cultures and opposition from the manpower involved.
Information on castes was included in the census following demands from several ruling coalition leaders including Lalu Prasad Yadav, Sharad Yadav and Mulayam Singh Yadavsupported by opposition parties Bharatiya Janata Party, Akali Dal, Shiv Sena and Anna Dravida Munnetra Kazhagam.[4] Information on caste was last collected during the British Raj in 1931. During the early census, people often exaggerated their caste status to garner social status and it is expected that people downgrade it now in the expectation of gaining government benefits.[5] Earlier, there was speculation of conduction caste-based census in 2011, first time after 80 years since 1931, to find the exact population of Other Backward Class (OBCs) in India,[6][7][8][9] which was later accepted and Socio Economic Caste Census 2011 was conducted whose first findings were revealed on 3 July 2015 by Union Finance Minister Arun Jaitley.[10] Mandal Commission report of 1980 quoted OBC population at 52%, though National Sample Survey Organisation (NSSO) survey of 2006 quoted OBC population at 41%[11]
There is only one instance of a caste-count in post-independence India. It was conducted in Kerala in 1968 by the Communist government under E. M. S. Namboodiripad to assess the social and economic backwardness of various lower castes. The census was termed Socio-Economic Survey of 1968 and the results were published in the Gazetteer of Kerala, 1971

The Indian Census is the most credible source of information on Demography (Population characteristics), Economic Activity, Literacy and Education, Housing & Household Amenities, Urbanization, Fertility and Mortality, Scheduled Castes and Scheduled Tribes, Language, Religion, Migration, Disability and many other socio-cultural and demographic data since 1872. Census 2011 will be the 15th National

Census of the Country. This is the only source of primary data in the village, town and ward level, It provides valuable information for planning and formulation policies for Central and the State Governments and is widely used by National and International Agencies, Scholars, business people, industrialists, and many more.

1. The present set of results pertains to data collected in the Census 2011 on disability
2. Information on disability of individuals was collected during the Population Enumeration phase of Census 2011 through 'Household Schedule'. Similar information was collected during 2001 census also. Information for individuals residing in 'Normal', 'Institutional' and 'Houseless' households were collected.
3. The table C-20- 'Disabled by age-group and type of disability' has been generated on the basis of processing 100% Census Schedules.
    1. Attempts to collect information on eight types of disabilities as against five in Census 2001.
    2. Designed to cover most of the disabilities listed in the "Persons with Disabilities Act, 1995" and "The National Trust Act, 1999".

Definitional Changes 2001-11

Type of disability	Change in definition
In Seeing	One eyed persons were treated as disabled at Census 2001. At the Census 2011 such persons have not been treated as disabled in seeing. At the Census 2011 enumerators were asked to apply a simple test to ascertain blurred vision. At Census 2001 no such instructions were given.
In Hearing	Persons using hearing aid have been treated as disabled at Census 2011. They were not treated as disabled at the Census 2001. Persons having problem in hearing through one ear although the other ear is functioning normally was considered having hearing disability in Census 2001. But in Census 2011, such persons were not considered as disabled.
In Speech	Definition was made clearer in Census 2011 to record persons with speech disability. For instance, "persons who speak in single words and are not able to speak in sentences" was specifically mentioned to be treated as disabled.

In Movement	Specific mention of the following was made in the definition for Census 2011: Paralytic persons Those who crawl Those who are able to walk with the help of aid Have acute and permanent problems of joints/muscles Have stiffness or tightness in movement or have loose, involuntary movements or tremours of the body or have fragile bones Have difficulty balancing and coordinating body movement Have loss of sensation in body due to paralysis, Leprosy etc. Have deformity of body like hunch back or are dwarf.
Mental Retardation	New category introduced at Census 2011. Mental Retardation was covered under the category of Mental disability at Census 2001.
Mental Illness	New category introduced at Census 2011. Mental Illness was covered under the category of Mental disability at Census 2001.
Any Other	New category introduced at Census 2011 to ensure complete coverage. This option enabled respondents to report those disabilities which are not listed in the question. In such cases, where informant was not sure about the type of disability this option of reporting disability as 'Any Other' was available to her/him.
Multiple Disability	New category introduced at Census 2011. The question has been designed to record as many as three types of disabilities from which the individual was reported to be suffering.

Disabled Population by Sex and Residence, India, 2011

Residence	Persons	Males	Females
Total	26,810,557	14,986,202	11,824,355
Rural	18,631,921	10,408,168	8,223,753
Urban	8,178,636	4,578,034	3,600,602

Percentage of Disabled to total population India, 2011

Residence	Persons	Males	Females
Total	2.21	2.41	2.01
Rural	2.24	2.43	2.03
Urban	2.17	2.34	1.98

Disabled Population by Type of Disability India : 2011

Type of Disability	Persons	Males	Females
Total	**26,810,557**	**14,986,202**	**11,824,355**
In Seeing	5,032,463	2,638,516	2,393,947
In Hearing	5,071,007	2,677,544	2,393,463
In Speech	1,998,535	1,122,896	875,639
In Movement	5,436,604	3,370,374	2,066,230
Mental Retardation	1,505,624	870,708	634,916
Mental Illness	722,826	415,732	307,094
Any Other	4,927,011	2,727,828	2,199,183
Multiple Disability	2,116,487	1,162,604	953

Census is nothing but a process of collecting, compiling, analyzing, evaluating, publishing and disseminating statistical data regarding the population. It covers demographic, social and economic data and are provided as of a particular date. Census is useful for formulation of development policies and plans and demarcating constituencies for elections. The Census of India has been conducted 15 times, As of 2011. It has been conducted every 10 years, beginning in 1871.

In Exam point of view, Questions related to Census is very common in all kinds of competitive exams. In every exam, we can expect a minimum of one or two questions from Census. Here is the simple and perfectly categorized 2011 Census of India.

- Census 2011 were released in New Delhi on 31st March 2011 by Union Home Secretary GK Pillai and RGI C Chandramouli.
- Census 2011 was the 15th census of india & ·7th census after Independece
- The motto of census 2011 was "Our Census, Our future".
- Total estimated cost of the Census was INR2200 crore (US$350 million).
- First census in 1872.
- Present Registrar General & Census Commissioner – C.Chandra Mouli
- Total Population – 1,210,569,573 (1.21 Billion)
- India in 2nd rank in population with 17.64%. decadal growth & China is 1st rank with decadal growth 19% (over 1.35 billion)
- World Population is 7 Billions
- Increase in population during 2001 – 2011 is 181 Million

The Indian Population Census 2011 covered a number of parameters during the survey. These parameters include population, growth rate in population, rate of literacy, density of population, sex ratio and child sex ratio (0-6 years). According to the census reports of Indian Census 2011, the population of India is 1,210,854,977 with 623, 724, 248 males and 586,469, 174 females. The total literacy rate in the country at present is 74.04%. The density of population is 382 persons/sq.km. In regards to sex ratio, at present there are 940 females on average on per 1000 males and the child sex ratio is 914 females per 1000 males.

The Indian Census survey is conducted to gather information from the grass root base which is essential to launch different welfare schemes like Annual Plans, 5 Year Plans etc. in the country for the privilege of common man here. The Houselisting & Housing Census provides extensive information on the status of the human settlements, the housing deficits as well as the different housing necessities to be looked for formulating the housing welfare policies.

The Population Enumeration offers needed Census data about land & its people in the present time. The survey reveals the current population trends, its varied characteristics that are valuable inputs for planning sound programs and policies aimed towards the welfare of India & her people and also for effective public administration.

OBJECTIVES

Students will be able to :

- Understand specific needs of children with LD (ADD & ADHD), Visual Impairment, Hearing Impairment, Mental Retardation and Orthopedic Handicaps.
- Create curriculum for developing attention, perception, motor ability for specific groups of children.
- Develop alternative curricula to develop language skills in those with sensory handicap.
- Design appropriate curricula to develop skills in reading, writing and arithmetic for specific disabling conditions.

DEFINITIONS

The National Sample Survey made its first attempt to collect information on the number of physically handicapped in the 15th round during July '59 to June '60. The enquiry was exploratory in nature and was confined to rural areas only. However, in the 16th round (July'60 - June'61), the geographical coverage was extended to urban areas. The subject was again taken up in the 24th (July'69 - June'70) and in the 28th (October'73 - June'74) rounds of NSS. The objective of these early enquiries was only to provide estimates of the number of persons in the country who suffered from certain specified physical handicaps. However, the types of physical handicap covered in all those rounds were not always same. The results obtained from NSS 24th and 28th rounds are published in Report No. 220. 1.2 For reasons of economy, information on the physically handicapped was collected in the early rounds in the survey schedules meant for other subjects. There was, therefore, very little scope for collecting information on cause, specific nature and other details of physical handicap. The enquiries were also not comprehensive due to obvious limitation of the survey methodology of those rounds. 1.3 The NSSO undertook a comprehensive survey of disabled persons in its 36th round during the second half of 1981, the International Year of the Disabled Persons. After a gap of ten years, a second survey on the disabled was carried out in the 47th round during July-December 1991 at the request of Ministry of Social Welfare, Govt. of India. In these surveys, the objective was to provide the data base regarding the incidence and prevalence of disability in the country. The basic framework of these surveys viz., the concepts, definitions and operational procedures was kept the same. While the earlier surveys were restricted to only the physically handicapped persons, in the surveys conducted during NSS 36th and 47th rounds, an extended definition was used to cover all the physically disabled persons. Information was collected from all persons with one or more of the three physical disabilities - visual, communication (i.e. hearing and/or speech) and locomotor. The particulars of disability of the disabled persons, such as, the type of disability, degree of disability, cause, age at onset of disability, type of aid/appliance used, etc. were collected along with some socio-economic characteristics. The results of the 36th round survey were released in two mimeographed reports - Report No. 305: Report on survey of Disabled Persons and Report No. 337: Characteristics of Disabled Persons, and that for the 47th round survey in Report No. 393: A Report on Disabled Persons in India. 1.4 Again after a gap of eleven years, the third survey on the disabled was carried out in the 58th round during July-December 2002 at the request of Ministry of Social Justice and Empowerment (MSJE), Govt. of India. In this round, the coverage was extended to include mental disability also, keeping all other concepts, definitions and procedures for physical disability same as those of the 47th round. Along with the particulars of physical and mental disabilities, the socioeconomic characteristics of the disabled persons such as their age, literacy, vocational training, employment, cause of disability, age at onset of disability, etc. were collected. 1.5 It may be mentioned here that in the surveys conducted during 36th and 47th rounds, an attempt was made to collect information on developmental milestones reached by children at different age ranges. However, this was not attempted in the 58th round survey. 1.6 Difficulties in collecting information on disability: Since the data are collected by the nonmedical investigators, it is imperative to define disability in a very careful and guarded way to minimize the bias of the investigators and respondents. To minimise these difficulties and to involve feasible and practical concepts and definitions of disability, the experts from the relevant medical disciplines were consulted prior to the 58th round. The decision to include mental disability in the survey was taken on the basis of a pre-test of the questions on mental disability, both for the listing and detailed schedules. 1.7 The results presented in this report relate to both physical and mental disabilities, namely, (i) mental disability, (ii) visual disability, (iii) hearing disability, (iv) speech disability and (v) locomotor disability. More specifically, the report gives the incidence and prevalence of different forms of disability and the distribution of the disability by cause of disability (as reported by the informant), marital status, educational level, living arrangements, activity status, etc. 1.8 Survey period: The field work for the 58th round survey was carried out during the second half of 2002 starting from July and continuing up to December - thus overing a period of six months.

1.9 Geographical coverage: The survey covered whole of Indian Union except (i) Leh and Kargil districts of Jammu and Kashmir, (ii) interior villages of Nagaland located beyond 5 kms. from the bus routes and (iii) villages in Andaman and Nicobar Islands which were inaccessible throughout the year. 1.10 Work programme: The survey period was divided into two sub-rounds of three months duration each. Equal number of sample first stage units was allocated to each of these sub-rounds with a view to ensuring uniform spread of the interviews over the entire survey period. 1.11 Sample Design: A stratified multi-stage sample design was adopted for the 58th round. The first stage units were in most cases 1991 census villages in rural areas and urban blocks - demarcated by the Urban Frame Survey - in urban areas. The ultimate stage units were households - constituting a group of persons normally living together and taking food from a common kitchen. The details of stratification, allocation of samples to various states into stratum, selection of sample, etc. are given in Appendix B: Sample Design and Estimation Procedure. 1.12 Sample size: The number of sample villages and urban blocks surveyed in Central sample was 4637 and 3354, respectively. A total of 45571 and 24731 households were surveyed in rural and urban areas, respectively. Statement 1.1 provides the number of first stage units allocated and surveyed in different states/uts. the Statewise sample number of disabled persons for each type of disability is given in Statement 1.2 for rural and urban areas. It may noted that while in Statements 1.1 and 1.2 sample persons with only one particular type of disability is given, while generating tables for any particular disability, all persons with that disability together with any other disability (multiple) have also been considered.

SUMMARY

3.0.0 As mentioned in Section One, the main findings of the survey for all the states, union territories and India as a whole are presented by rural-urban residence. Besides providing incidence and prevalence rates of the disability in the population, the demographic and other correlates such as marital status, educational level, living arrangements, activity status, etc., of this group of persons have been highlighted in the discussion. Further, the distribution of the disabled by cause of disability, age at onset, etc. have been examined separately for each of the disability, namely, mental, visual, hearing, speech and locomotor. 3.0.1 It may be mentioned at the beginning that the discussions in this section are mainly focussed on the all-India results with its distinctive features among males and females, and also in its rural and urban parts. The summary tables for the states and union territories are presented at the end of this section to reveal the variations in the indicators of study across the regions. The detailed tables at the all-India level are presented in Appendix A. It may be noted that the sample size pertaining to smaller states and union territories may not be adequate and hence the results for those states and union territories are to be interpreted carefully. 3.0.2 Use of estimated aggregates: Generally, the population estimates obtained from the NSS surveys are found to be lower than those of the census population or its projections. However, the ratios obtained from the surveys are expected to be much closer to the true situation. Thus the marginal aggregates of population or households presented in the detailed tables of the Appendix may be used only for combining ratios. Estimated number of persons or households under any particular classificatory characteristic may be obtained by applying the relevant survey-based ratio to the projected population. 3.0.3 At the all-India level, 45571 and 24731 households were surveyed in rural and urban areas, respectively from 4637 villages and 3354 urban blocks. The number of disabled persons enumerated in rural and urban India was 49,300 and 26,679, respectively. According to the survey estimates, the number of disabled persons in the country was 18.49 million during July to December, 2002, and they formed about 1.8 per cent of the total estimated population. 3.0.4 About 10.63 per cent of the disabled persons suffered from more than one type of following disabilities, (i) mental disability in the form of (a) mental retardation or (b) mental illness, (ii) visual disability in the form of (a) blindness or (b) low vision, (iii) hearing disability, (iv) speech disability, and (v) locomotor disability. The distribution of persons having multiple disability by type of disability is given in detailed tables presented in Appendix A (Table 17) for rural and urban sectors of all-India. It may be noted that the diagonal cells of the table except for locomotor disability have been crossed. This implies that persons with single disability only are not taken into account for obtaining the distribution given in this table. In the case of locomotor disability, multiple types of locomotor disability was also considered as multiple disability (details in para 3.6.0). The total estimated population for 1st October, 2002, is obtained by applying decennial (exponential) growth rate of population for 1991 – 2001 on Census 2001 Population. 3.0.5 The aggregated estimates of the disability in rural and urban India are given in Statement 2, separately for each sex and type of disability. These estimates are obtained by using survey proportions on the projected population. It is observed that among the different types of disabilities, the number of persons having locomotor disability was the highest in both rural and urban India followed by the number of persons with hearing disability and visual disability

For the purpose of the present survey, a person with restrictions or lack of abilities to perform an activity in the manner or within the range considered normal for a human being was considered disabled. The estimates of prevalence of disability (number of disabled persons per 1,00,000 persons) are given in Statement 4. The survey reveals that for every 1,00,000 people in India, there were 1755 who were either mentally or physically disabled. Among the rural residents, the prevalence of disability was 1.85 per cent and that among the urban was 1.50 per cent. Between the two sexes, the prevalence of disability was marginally higher among males than among females. The rate for males was 2.12 and 1.67 per cent while that for females was 1.56 and 1.31 per cent in rural and urban India, respectively. The inter-state variations in the prevalence rate as shown in Statement 4.1, are significant in both the sectors. In the rural areas, it ranged from 0.67 (Delhi) to 2.71 (Himachal Pradesh) per cent while in the urban areas, it ranged from 0.52 (Delhi) to 2.61 (Lakshadweep) per cent excluding Arunachal Pradesh where the rate was only 27 per 1,00,000. The prevalence rates among males were higher than among females in all the states

Incidence of disability: The incidence of disability in population, that is, the number of persons whose onset of disability (by birth or otherwise) had been during the specified period of 365 days preceding the date of survey per 100,000 persons, is shown in Statement 6 for all-India. The corresponding rates are given for all the states and union territories and separately for males and females by their residential status. About 69 persons were born or otherwise became disabled per 100,000 persons in rural India during the reference year. The incidence rates were almost the same in both the rural and urban India. As in the case of prevalence rate, the incidence rate is also observed to be higher among males than that among females. The rates among males were 77 and 75, respectively in rural and urban India as against 61 and 58, respectively among females. On this aspect, the states and union territories also exhibit the same feature as given in Statement 6.1. The state-wise differences were quite high - ranging from 2 to 117 per 100,000 persons in rural India and from 11 to 132 per 100,000 persons in urban India. However, the incidence rate was highest in Adhra Pradesh (108). This apart, the states which showed high incidence rate of disability was Kerala (97), Himachal Pradesh (96), Maharashtra and Haryana (82 each) barring Chandigarh and Aunachal Pradesh where the rates were insignificant. Note that the prevalence rates were also relatively very low in the urban areas of these places.

Disability since birth: Some people are born with disability and the incidence varies over the types of disability. Prevalence of disability by birth is given in Statement 7 by type of disability separately for each sex and sector at all-India level. It is seen that about 84 per cent of the mentally retarded and 82 per cent of the persons having speech disability were born with disability. For persons with other type of disability the incidence by birth is not as significant as in the case of the mentally retarded or persons with speech disability. Most of them become disabled during the course of life. Incidence for some of the disabilities is largely associated with the old age.

Extent of physical disability: For determining the extent of physical disability of a disabled person, self-care, such as, ability to go to latrine, taking food, getting dressed, etc. were taken into account. Irrespective of whether or not a disabled person had 'single' or 'multiple' disability, they were classified into one of the four categories, viz., (i) those not able to take selfcare even with aid/appliance, (ii) those able to take self-care only with aid/ appliance. The degrees of disability referred to the above three categories are termed as (i) cannot function even with aid/appliance, (ii) can function only with aid/appliance, and (iii) can function without aid/appliance. There was another category of the disabled for whom the aid/appliance was neither available nor tried and this category alone was about 9 to 10 per cent of all the disabled. The distribution of the disabled by these categories, given in Statement 8 for each sex separately for rural and urban sectors of all-India reveals that among the disabled, about 13 per cent in both rural and urban India were observed to be severely disabled as they could not function even with aid/appliance. The corresponding percentage for males was 12 and for females a little higher at 15. On the other hand, about 60 per cent of the disabled were able to take self-care without any aid or appliances. In this category, the rural-urban differences are absent but a higher percentage of disabled males were capable to take self-care as compared to disabled females. The all-India pattern by and large is also reflected in the states

CHECK YOUR PROGRESS

1. What is curriculum? How to create curriculum for developing attention, perception, motor ability for visual impaired children?
2. What points would you take into consideration to develop alternate curriculum for the development of language skills in those with sensory handicap.
3. Design curricula for developing the following skills in disability condition of your choice:
   (a) Reading skills
   (b) Arithmetic skills
   (c) Writing skills

ASSIGNMENTS

1. Plan a curriculum to develop skills in reading comprehension in 10 yrs. old child with LD (ADHD).
2. Design a curriculum to develop pre-language skills in a 8 yrs. old child with pre-linguial deafness.
3. You have started an early intervention clinic. Plan a curriculum for children with VI, CP, & MR to optimize their development.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop and Sarah Lyman Kravits. (1998) Keys to Success. How to Achieve your goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986) The child's Language and The Teacher – A Handbook.

3. Lyndon W Searfoss John E. Readence (1994) Helping Children Learn To Read. Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The Trainers of the Mentally Retarded Persons. Pub.: NIMH Sewnderabad.

5. Paul A Albeoto Anne C Troutman (1990) Applied Behaviour Analysis For Teacher Merrill Pub. Co. ohio 43216.

UNIT – 4: IMPORTANCE OF EARLY IDENTIFICATION AND INTERVENTION

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Students with visual impairment may look like typical children, but early signs can indicate a problem. It's important to identify these signs at a young age in order to take advantage of early intervention. Learn the early signs of visual loss in children and what can be done for them in school.

someone having no sight at all to someone who has partial vision loss. People who are legally blind have some vision, but have lost enough sight that it requires them to stand 20 feet from an object to see it as well as someone with perfect vision who could see it 200 feet away. Children who are visually impaired since birth have congenital blindness, which can have several causes. This type of blindness can be inherited or caused by an infection transmitted from the mother to the fetus during pregnancy. vision in an eye caused by lack of use of it in the first few years of life. Strabismus, or misalignment/crossing of the eyes, is a common cause of amblyopia. The condition happens when the brain begins ignoring messages sent by one of the misaligned eyes. Lazy eye also occurs when the brain may suppress images from the weaker eye and the vision in that eye stops developing normally.

- Not looking at others in the eyes
- Reaching in front of or beyond an object
- Holding objects very close or very far to see them
- Turning or tilting his head when he uses his eyes
- Continuously pushing or poking his eyes
- Looking above, below or off to one side of an object, rather than directly at it
- Bumping into objects and having a lot or trouble seeing at night
- Feeling for objects on the ground instead of looking with her eyes

After the identification of visually impaired students under three, parents should begin working with an early childhood interventionist. Young children who are visually impaired are eligible for early intervention services, which can help a family through the child's first few years of life. Early intervention for students with visual impairment is vital in enhancing social, physical, and intellectual development.
When a child who is over three, he will qualify for special education services if the visual impairment impacts his education. Parents should contact their school district's special education office to locate services for their child. A child with visual impairment may qualify for services from teachers of students with visual impairment, an orientation and mobility specialist, a physical therapist, a speech therapist, or a psychologist, depending on individual needs. Children with visual impairment should also be provided with modifications and accommodations in an inclusive classroom.

The Individuals with Disabilities Education Act (IDEA) ensures that children who have hearing loss receive free, appropriate early intervention programs from birth to age 3 and throughout the school years (ages 3 to 21). Early intervention services for infants and toddlers are family-centered and are designed to:

- Help your child stay on schedule with his or her speech, language, and communication skills

- Enhance your understanding of your child's hearing loss and special communication needs
- Support your family in a way that helps you feel confident in raising your child with hearing loss
- Keep track of your child's progress and to make decisions for intervention and education each step of the way as your child develops

Why are early identification and early intervention for hearing loss so important?

Hearing is critical for the development of speech, language, communication skills, and learning. The earlier that hearing loss occurs in a child's life, the more serious is the effect on the child's development. Similarly, the earlier the hearing loss is identified and intervention begun, the more likely it is that the delays in speech and language development will be diminished. Recent research indicates that children identified with hearing loss who begin services before 6 months old develop language (spoken or signed) on a par with their hearing peers.

What is the responsibility of the school district when it comes to a student's hearing aids and assistive listening systems?

If a student is eligible for services under IDEA or has a Section 504 plan (under **the Rehabilitation Act**), then schools are responsible to ensure that hearing aids worn in school are functioning properly. Moreover, hearing assistive technology must be provided if the student requires that service. Students with hearing loss can benefit greatly from, and are frequently provided, hearing assistive devices (such as frequency modulation systems) in their school. It is important that parents choose a hearing aid with capabilities (such as telecoil) to work with these hearing assistive technologies.

Schools must also ensure that those using hearing assistive technology (including teachers) are properly trained.

The National Institutes of Health Consensus Development Conference on Early Identification of Hearing Impairment was convened to address (1) the advantages of early identification of hearing impairment and the consequences of late identification of hearing impairment; (2) the issue of which children should be screened for hearing impairment and when; (3) the advantages and disadvantages of current screening methods; (4) the question of which model for hearing screening and followup is preferred; and (5) future directions for research in diagnosis and management of hearing impairment in infants and young children. Following 2 days of presentations by experts and discussion by the audience, a consensus panel weighed the evidence and prepared their consensus statement.

Among their findings, the panel concluded that (1) all infants admitted to the neonatal intensive care unit be screened for hearing loss prior to discharge; (2) universal screening be implemented for all infants within the first 3 months of life; (3) the preferred model for screening should begin with an evoked otoacoustic emissions test and should be followed by an auditory brainstem response test for all infants who fail the evoked otoacoustic emissions test; (4) comprehensive intervention and management programs must be an integral part of a universal screening program; (5) universal neonatal screening should not be a replacement for ongoing surveillance throughout infancy and early childhood; and (6) education of primary caregivers and primary health care providers on early signs of hearing impairment is essential.

There is a clear need in the United States for improved methods and models for the early identification of hearing impairment in infants and young children. Approximately 1 of every 1,000 children is born deaf. Many more are born with less severe degrees of hearing impairment, while others develop hearing impairment during childhood. Reduced hearing acuity during infancy and early childhood interferes with the development of speech and verbal language skills. Although less well documented, significantly reduced auditory input also adversely affects the developing auditory nervous system and can have harmful effects on social, emotional, cognitive, and academic development, as well as on a person's vocational and economic potential. Moreover, delayed identification and management of severe to profound hearing impairment may impede the child's ability to adapt to life in a hearing world or in the deaf community.

The most important period for language and speech development is generally regarded as the first 3 years of life and, although there are several methods of identifying hearing impairment during the first year, the average age of identification in the United States remains close to 3 years. Lesser degrees of hearing loss may go undetected even longer. The result is that for many hearing-impaired infants and young children, much of the crucial period for language and speech learning is lost. There is general agreement that hearing impairment should be recognized as early in life as possible, so that the remediation process can take full advantage of the plasticity of the developing sensory systems and so that the child can enjoy normal social development.

During the past 30 years, infant hearing screening has been attempted with a number of different test methods, including cardiac response audiometry, respiration audiometry, alteration of sucking patterns, movement or startle in response to acoustic stimuli, various behavioral paradigms, and measurement of acoustic reflexes. For the past 15 years, auditory brain stem response (ABR) audiometry has been the method of choice. More recently, attention has recently turned to the measurement of evoked otoacoustic emissions (EOAE), which shows promise as a fast, inexpensive, noninvasive test of cochlear function. Each method is effective in its own way, but technical or interpretative limitations have impeded widespread application. Moreover, these approaches vary in their sensitivity, specificity, and predictive value in identifying hearing impairment.

Until now, most neonatal screening programs have focused on infants who satisfy one or more of a number of criteria for inclusion in a "high-risk register." However, the use of high-risk criteria (HRC) to limit the population being screened excludes approximately 50 percent of infants with hearing impairment. The preferred screening test method for HRC children has come to be ABR, combined with audiologic followup and/or diagnostic ABR for those infants who fail the screening protocols. Despite the relatively good predictive efficiency of ABR, its cost, time requirements, and technical difficulties have discouraged the general application of this method in screening the far larger newborn population not meeting the HRC.

On March 1-3, 1993, the National Institute on Deafness and Other Communication Disorders, together with the Office of Medical Applications of Research of the National Institutes of Health convened a Consensus Development Conference on the Early Identification of Hearing Impairment in Infants and Young Children. Cosponsors of the conference were the National Institute of Child Health and Human Development and the National Institute of Neurological Disorders and Stroke. The conference brought together specialists in audiology, otolaryngology, pediatrics, neonatology, neurology, speech and hearing sciences, speech-language pathology, health care administration, epidemiology, education, counseling, nursing, and other health care areas, as well as representation from the public. Following 1-1/2 days of presentations by experts in relevant fields and discussion by the audience, an independent consensus panel weighed the scientific evidence and prepared a draft statement in response to the following key questions:

- What are the advantages of early identification of hearing impairment and the consequences of late identification of hearing impairment?
- Which children (birth through 5 years) should be screened for hearing impairment and when?
- What are the advantages and disadvantages of current screening methods?
- What is the preferred model for hearing screening and followup?
- What are the important directions for future research?

What Are the Advantages of Early Identification of Hearing Impairment and the Consequences of Late Identification of Hearing Impairment?

The primary justification for early identification of hearing impairment in infants relates to the impact of hearing impairment on speech and language acquisition, academic achievement, and social/emotional development. The first 3 years of life are the most important for speech and language acquisition. Consequently, if a child is hard of hearing or deaf at birth or experiences hearing loss in infancy or early childhood, it is likely that child will not receive adequate auditory, linguistic, and social stimulation requisite to speech and language learning, social and emotional development, and that family functioning will suffer. The goal of early identification and intervention is to minimize or prevent these adverse effects.

The consequences of hearing impairment are many. Animal studies show that early auditory deprivation interferes with the development of neural structures necessary for hearing. Human infants with hearing loss, particularly those with sensorineural impairments, may experience similar disruptions that will have a direct impact on language acquisition. Significant hearing loss interferes with the development of phonological and speech perception abilities needed for later language learning, e.g., meaningful language at the word, phrase, and sentence levels. These impairments in communication skills can lead to poor academic performance (especially reading), and ultimately, to limitations in career opportunities.

The degree and type of hearing impairment impact on a child's development. Other factors can further exacerbate the consequences of hearing impairment. For example, some children have additional sensory disabilities and/or associated neurological disorders that further interfere with perceiving and processing information. Environmental factors, such as the quality of language input provided by the parents, can either facilitate or impede communication skills. Socioeconomic-related factors, such as the lack of access to health care, other associated health problems, high-risk populations, and social stresses, also may exacerbate the consequences of deficits. Early identification and intervention can address these factors, thus minimizing their effects.

Over the past two decades, advances in technology have provided ever-improving opportunities to identify hearing impairments in infants soon after birth. Consequently, the systematic evaluation of the effects of earlier identification and earlier intervention can now be conducted. Because such data are not presently available, it is difficult to evaluate fully the effectiveness of early identification and intervention on language development. There are, however, a wide range of clinical observations, a number of descriptive studies, and a few statistically controlled, nonrandomized trials that support the benefits of early identification and intervention. The benefits to be gained from early intervention may vary, depending on the severity and type of hearing impairment. Children with sensorineural hearing loss who receive early amplification, when indicated, and a comprehensive habilitation program may show improved speech and language skills, school achievement, self-esteem, and psychosocial adaptation when compared to hearing-impaired children who do not receive amplification until 2 to 3 years of age. The advantages of early intervention can only be attained when the appropriate services are available and accessible to these children and their families.

Which Children (Birth Through 5 Years) Should Be Screened for Hearing Impairment and When?

Answering the questions of who should be screened and when presents us with a practical dilemma. It is clear that the earliest possible identification of hearing-impaired infants is optimal for effective intervention to improve communication skills, language development, and behavioral adjustment. Identification of all children with hearing impairment at birth is ideal. As a practical matter, the cost of universal screening has been prohibitive. Attempts have been made to limit costs by focusing neonatal testing on those at highest risk. Unfortunately, research shows that this approach misses 50 percent of children who are eventually diagnosed with severe to profound hearing impairment. In spite of current screening programs, the average diagnosis of hearing impairment remains constant at about 2-1/2 years of age. In order to meet the goal of the Joint Committee on Infant Hearing to identify and initiate treatment by 6 months of age and to more completely identify hearing-impaired infants, we must dramatically change our approach to screening.

Some changes can be made in auditory screening procedures that would have a minimal effect on cost but would increase identification rate. Data have shown that infants admitted to the neonatal intensive care unit (NICU) have an increased risk of significant bilateral sensorineural hearing loss (1-3 percent); the addition of other neonatal high-risk factors does not add significantly to the identification of hearing loss. *Consequently, we recommend that all infants admitted to the NICU be screened for hearing loss prior to discharge.* To improve the

accuracy and efficiency of the test, screening should take place as close to discharge as possible. Infants in the well-baby nursery with diagnoses of craniofacial anomalies, family history of hearing loss, and diagnosis of intrauterine infection comprise a special high-risk category. Thus, they should be screened using the same protocol and followup vigilance as the NICU population.
In addition to screening all NICU babies, we strongly recommend that universal screening be implemented for all infants within the first 3 months of life. Recent data suggest that this will virtually complete our identification of newborns with hearing impairment. Even though we recommend universal screening within the first 3 months, as a practical matter this is most efficiently achieved by screening prior to discharge from the well-baby nursery. The disadvantages of hospital well-baby screening, such as missed screening because of early discharge and the possibility of higher false-positive rate, are outweighed by the accessibility of all newborns to testing at this time. The addition of screening in the well-baby nursery and as a part of well-baby care will increase cost. The benefit, however, is likely to be high. For well-baby screening to be cost effective, we recommend techniques that are rapid, reliable, highly sensitive, specific, and easily administered by trained and supervised personnel. Infants who are not screened in the hospital should be screened by 3 months of age.

Identification of hearing impairment must be seen as imperative for all infants and as an important adjunct to child health care. Since 20-30 percent of children who subsequently have hearing impairment will develop hearing loss during early childhood, an ever-vigilant pluralistic approach must be taken to hearing screening and identification of young children. The first approach must include the eliciting and acknowledging of parental concern regarding hearing loss and/or speech and language acquisition. At present, 70 percent of children with acquired hearing impairments are initially identified by parents. *Parental concern about hearing should be sufficient reason to initiate prompt formal hearing evaluation.* Another necessary approach includes ongoing evaluation of speech and language development at routine child health supervision visits using formal assessment tools. Failure to attain appropriate language milestones, especially during the first 18 months of life, should result in prompt referral for further hearing evaluation.

Several causes of acquired hearing loss during early childhood have been described. For example, bacterial meningitis has been associated with a 5-30 percent incidence of profound hearing loss. *We recommend that all children recovering from bacterial meningitis be referred for diagnostic audiologic assessment, ideally prior to discharge from the hospital.* Other risk factors for acquired or progressive hearing loss, for which diagnostic hearing evaluation should be considered include, but should not be limited to, significant head trauma with persistent symptoms referable to hearing or balance, viral encephalitis or labyrinthitis, excessive noise exposure, exposure to ototoxic drugs, perinatal cytomegalovirus (CMV) infection, familial hearing impairment, infants with chronic lung disease or diuretic therapy, and infants with repeated episodes of otitis media with persistent middle ear effusion.

Since new cases of hearing impairment can arise in early childhood, school entry screening procedures should be extended to all private and public school students. School entry screening represents an additional universal approach for the identification of hearing impairment in America's children. Schools must make appropriate referral for audiologic followup and educational intervention.

What Are the Advantages and Disadvantages of Current Screening Methods?

Ideally, all children who have significant hearing impairment will be detected prior to the development of speech and language so that appropriate intervention might maximize their potential for normal development. An ideal screening method would also be readily available at modest cost with complete specificity and sensitivity. Unfortunately, no such screening method is currently available. Each of the current screening methods, while offering advantages, also has disadvantages.

High-Risk Criteria

High-risk criteria (Joint Committee on Infant Hearing, 1990), which identify approximately 9 percent of newborns, encompass half of the children who are subsequently found to have hearing impairment;

approximately 1-3 percent of HRC babies have significant bilateral sensorineural hearing loss. Identification of HRC babies can be performed routinely using existing hospital-based health care mechanisms at modest cost. Although lacking in sensitivity, the HRC has been used as a first stage for other screening strategies. The use of HRC to screen for hearing impairment has many disadvantages. The principal disadvantage is that 50 percent of newborns with congenital hearing deficits are not in the HRC group and are missed by this screen. Children who are not born in larger hospitals may not be routinely identified as being at risk. Another disadvantage of this screen is that followup is not optimal in most programs currently in use, thus only a small proportion of cases are identified.

Auditory Brainstem Responses

Auditory brainstem responses can be used to screen for hearing impairment in newborns, since ABR's do not require a voluntary response and can be done without sedation. This screening test is highly sensitive; nearly all children born with significant congenital hearing deficits could be detected in the newborn nursery using ABR and can be referred for further evaluation. However, over-referral is a problem, since there are false-positive ABR's in babies with normal hearing. In the NICU setting, for every child with significant hearing impairment who is detected, approximately six babies are referred for followup. In the well-baby nursery, where the prevalence of hearing impairment is far lower, for every child with significant hearing impairment, more than 100 babies are referred. This high referral rate may cause undue parental anxiety. Since ABR screening and followup are expensive and require trained personnel, this method has been applied principally to newborns who are at highest risk for hearing impairment (those in the NICU or the HRC). Newer automated ABR technology and innovative analysis schemes may diminish costs.

Evoked Otacoustic Emissions

Evoked otoacoustic emissions represent a newer type of newborn screening method that offers potential additional benefits. Like the ABR, this technique could be applied to all newborns prior to hospital discharge. The measurement of EOAE can be performed in the newborn nursery with less skilled personnel in a shorter time than conventional ABR and without the need for scalp electrodes. The sensitivity of EOAE in the detection of congenital hearing impairment is very high, but newborn EOAE testing tends to have more false-positives when compared to ABR, especially during the first 48 hours of life. Nevertheless, the use of EOAE in the detection of hearing impairment in well babies could be a more cost-effective way of detecting early hearing impairments. Over-referral may be a major problem.

Behavioral Testing

Behavioral testing (such as visual reinforcement audiometry or conditioned orienting response), usually at 6 months of age or later, may be used to detect hearing impairment reliably in almost all infants prior to the acquisition of speech and language. This method would minimize the problems of over-referral and "labeling" that are inherent in the newborn screening methods. Identified infants could begin timely rehabilitation or intervention, and later onset hearing impairments could be detected. Several disadvantages of this strategy exist: (1) traditional behavioral audiometry in a 6-month-old infant requires skilled personnel and is time-consuming; (2) unlike newborn testing, the evaluation of older infants requires reasonable access to a testing facility; (3) testing is most difficult in developmentally delayed infants who are at highest risk; and (4) some hearing impairments would not be treated until after 1 year of life because of a lack of lead time to implement intervention. There are new versions of behavioral audiometry that may eliminate some or all of these objections, but these new techniques remain to be validated in large samples. These new behavioral techniques may provide appropriate methods for use in organized hearing screening programs beyond the neonatal period.

Public and Professional Education

Presently, as many as 70 percent of infants and children with hearing impairment are identified because of parental concern about their child's hearing. Efforts to educate parents about signs of hearing impairment by brochures and posters in prenatal clinics and physician's offices are simple and inexpensive. Public service announcements should be used.

Professional societies should be encouraged to issue position papers on the importance and current recommended methods of identification. The effectiveness of these strategies has not been extensively evaluated.

Professional education involves calling attention to (1) neonatal risk factors for hearing impairment (the HRC), (2) risk factors for acquired hearing impairment, (3) early behavioral signs of hearing impairment, and (4) the ineffectiveness of crude measures of hearing sensitivity such as hand clapping, which are useless and misleading. In order to be effective, regular professional education and continuing professional education activities at regular intervals will likely be necessary to make health care providers alert and the health system responsive to identifying children with hearing impairment. Such ongoing continuing education programs have been developed by several professional organizations. Continuing professional education has begun in Colorado and Arizona, and guidelines for child health supervision have been developed by the American Academy of Pediatrics and the American Academy of Family Practice. This strategy for professional education is inexpensive and utilizes the current health care system. Ongoing developmental surveillance by attentive and educated primary health providers would likely identify those children with acquired hearing impairment. The principal disadvantage of such a system is that children do not consistently receive medical surveillance. Finally, this method may not identify children with hearing deficits before 1 year of age.

What Is the Preferred Model for Hearing Screening and Followup?

The principal goal of an early identification program is to identify hearing impairment present at birth, in order to effect appropriate intervention as early as possible. *In order to detect those children born with moderate, severe, and profound hearing impairment, we recommend universal newborn screening*. Because of the accessibility of babies in the newborn nursery, such screening is best accomplished prior to hospital discharge.

The screening of all newborn babies presents special problems in cost feasibility. There are approximately 4 million live births each year in the United States. Given an incidence of hearing impairment of 0.1 percent per year (i.e., 1 in every 1,000 live births) then 3,996,000 babies who are

screened will have normal hearing sensitivity. It is vital that these babies be identified rapidly, and at minimal cost.
The panel identified two techniques -- EOAE and ABR -- as showing maximal promise as universal screening tools for the newborn. As noted earlier, each has its unique advantages and disadvantages. Weighing the evidence presented, the panel felt that EOAE shows best promise as a rapid, cost-effective means of quickly discharging all babies with normal auditory systems. In keeping with its high sensitivity, however, the EOAE lacks adequate specificity. It fails a relatively large number of babies whose hearing sensitivity is, in fact, normal. In order to prevent the majority of these "false alarms" from burdening the system for followup diagnostic evaluation, a second or confirmatory screen seems desirable. The panel felt that this goal would be best achieved by a second-stage ABR screen of all babies who fail the EOAE screen. Thus the preferred model for universal screening begins with an initial screen by EOAE. All babies who pass this screen are discharged. All babies who fail, however, are rescreened by ABR. Babies who pass the ABR screen are discharged but should be flagged for rescreen at 3-6 months. Babies who fail the ABR screen are referred for diagnostic evaluation. The purpose of the followup diagnostic evaluation is twofold: (1) to verify the existence and to determine the type and severity of hearing impairment and (2) to initiate a remediation program for the child and family.

It should be emphasized that only a small percentage of the total number of babies screened experiences both stages of the total screening process. If the specificity of the EOAE screen is taken as 90 percent, then 90 percent of the babies screened are discharged after the first (EOAE) stage. Only the 10 percent who fail the EOAE stage will undergo the second, ABR, stage. The roles of the two stages, EOAE and ABR, are viewed as complementary. The first, EOAE, rapidly and inexpensively rules out significant hearing impairment (99.9 percent of all babies), but has limited specificity. The second, ABR, appears to require more time and effort, but has the potential to identify failure with better specificity.
Although this two-stage screening process is recommended, the panel is aware that many clinics and hospitals have already successfully

implemented universal screening programs based on ABR alone. The panel encourages such sites to continue these programs. The procedure detailed above is recommended, however, as an apparently cost-feasible approach to mass screening for those teams contemplating the initiation of a universal screening program.
It must be recognized that not all hearing impairment in infancy and early childhood will be present at birth. A significant number of infants and children will develop hearing impairment during the first years of life. Such losses may be acquired as a result of medical conditions or may result from progressive hereditary etiologies.

The detection of late onset or progressive losses must rely on a pluralistic approach. Screening at birth is best accomplished before the baby leaves the hospital, but during the next 2 to 3 years there is no single comparable site that can serve as the optimal location for identification. It should be noted, however, that, in some locales, hearing screening programs are in place through day-care and head-start programs. Education of parents or other primary caretakers, medical and nursing personnel, and all other professionals who have opportunity to observe the child must be relied upon to recognize factors that place the child at high risk for hearing impairment and behavioral signs of a possible change in hearing status, in order to refer for appropriate audiologic assessment. School entry, to include both public and private resources, will continue to provide an additional opportunity for universal identification of children with significant hearing impairment.
Finally, it should be recognized that a critical component of any screening program is a database system. Such a database is important for tracking the progress of infants and children identified by the program and for ongoing monitoring of all aspects of the performance of the screening program.

What Are the Important Directions for Future Research?

- Conduct large-scale studies on efficacy of early identification and intervention. Examples include:
    - Controlled trials of screening by audiologists versus trained nonprofessionals or volunteers.

  - Controlled trials of the influence of different settings (NICU, special test environment) on the effectiveness of screening procedures.
  - Comparison of early intervention with later intervention for different levels of hearing loss and types of intervention.
- Evaluate the validity and reliability of screening instruments. For example, these evaluations might include:
  - Followup of a random sample of patients initially identified as negatives. (Special followup is not required -- can link with later routine screening results.)
  - Studies to allow comparison of various screening techniques; e.g., randomizing to different decibel thresholds (30 versus 40) or to allow comparison of conditioned orienting response (COR) characteristics.
- Compare various screening procedures (e.g., transient evoked otoacoustic emissions with distortion product otoacoustic emissions) for time and cost.
- Test the feasibility of screening methods for identifying hearing impairment in infant populations at 1 month, 3 months, and 6 months in remote satellite clinics servicing ethnic minority populations who may be particularly at risk for hearing impairment (examples are Native Americans, Hispanic Americans, and African Americans).
- Develop innovative behavioral audiometric tests that are applicable for screening programs.
- Determine whether a two-tier screening system (screen, confirm, evaluate) works better than having a failure lead to the evaluation system.
- Study the cost-effectiveness of universal screening for infant hearing impairment.
- Develop and evaluate programs for intensive parent education pertaining to developmental milestones related to normal language acquisition and indicators for identification of hearing impairment in infants and young children.

- Develop and evaluate programs for intensive professional education regarding the need for early identification of hearing impairment and early intervention.

Conclusions

- The lack of early identification of hearing-impaired infants continues to be a significant public health problem in the United States. The result of this delay in identification leads to delay in appropriate clinical intervention.
- Because present screening is not universal but based on high-risk criteria, we currently identify between 30 and 50 percent of those children born with significant hearing impairment. Moreover, the average age of identification remains close to 3 years.
- Recent technological developments have produced screening methods that are rapid, reliable, sensitive, and easily administered.
- This consensus panel concludes that these advances offer an opportunity, for the first time, to initiate universal screening for hearing impairment in early infancy.
- The panel endorses the recommendations of the Joint Committee on Infant Hearing that all hearing-impaired infants should be identified and treatment initiated by 6 months of age. In order to achieve this objective, the panel recommends universal screening for hearing impairment prior to 3 months of age.
- Because of the unique accessibility of almost all infants in the newborn nursery, the consensus panel recommends screening of *all* newborns, both high and low risk, for hearing impairment prior to hospital discharge.
- Clearly, universal screening will increase the number of infants identified with hearing impairment. This will necessitate adequate diagnostic followup and treatment facilities. Comprehensive intervention and management programs must be an integral part of a universal screening program.

- Because 20-30 percent of hearing-impaired infants will acquire their hearing loss during early childhood, universal neonatal screening is not a replacement for ongoing surveillance throughout infancy and early childhood. The panel encourages continued awareness of the necessity for early identification of hearing impairment. Education of primary caregivers and primary health care providers on early signs of hearing impairment remains an important goal.
- School entry screening will provide another opportunity for universal identification of children with significant hearing loss.

OBJECTIVES

Early identification is extremely important because early intervention will be most effective. Sometimes it is unclear whether a child has a vision problem or not. Physical signs of vision problems include eyelids drooping over one or both eyes, or eyelids that do not completely cover the eyes when the child closes them. If a child has a clear squint, has jerky eye movements, or has eyes that do not move together, parents should see a pediatric ophthalmologist. Other signs include:

DEFINITIONS

Impaired vision may affect a child's general development and the whole family if the early intervention does not start really early. Therefore detection of vision impairment is important and availability of early treatment and (re)habilitation (early intervention) should be high on the list in the development of paediatric medical services. For planning detection of deviations from normal vision development we need to know how vision may deviate from normal. The most common deviations are discussed in this information for paediatricians and public health nurses.

In vision screening we have two goals:

1. to find children who are visually impaired, a small group (<1%) among healthy looking children and 20 to 80% among children who have other more noticeable impairments.
2. children with strabismus and/or amblyopia or at risk of developing them (2-4%).

Since **more than half of visually impaired infants have several impairments** that affect their activities, we have a *third area of vision screening*:

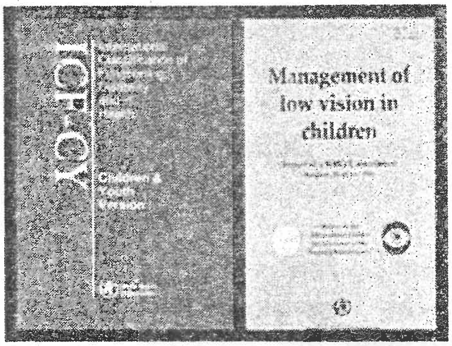
3. visual impairment should be specifically sought in children with other impairments: **motor impairments, developmental delay and hearing impairment**, *by referring all infants with impairments to ophthalmologic examination with a special question on vision and refraction, not only structure of the eyes*.**Small prematurely born infants** are a new group that should be carefully followed to detect vision losses typical to them.

Healthy children with amblyopia or strabismus can be treated in many countries, although not in all. **Several types of strabismus and amblyopia can be prevented or corrected by using spectacles and thus surgical interventions are avoided.** In countries where infants and children may get spectacles, early detection of deviations from norm is therefore mandatory. Detection of deviations is most effective as a part of visits to health care stations or doctors' offices for vaccination during the first year. Later vision screening of all healthy children at the age of 4 years and at school is an effective way of securing optimal visual functioning in children.

In most countries vision screening is in the hands of health care workers: public health nurses and their aids; in other countries general practitioners and paediatricians should screen for sensory impairments as a part of their work.

Parents of young children should get information on child development and its deviations from norm to be motivated to bring their children to the nurse or the doctor when they notice something unusual in the child's eyes or visual functioning.

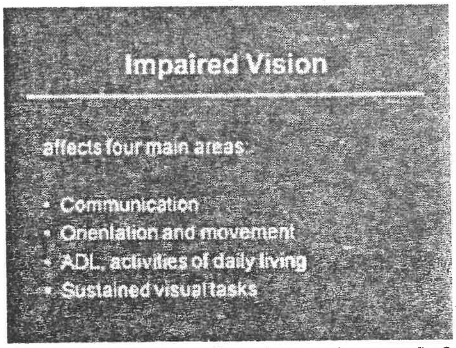
This lecture was given in 2001 in and updated in September 2010 to add the changes that had happened in the last ten years.



The International **Classification of Functioning, Disability and Health, Children and Youth Version** (ICF –CY 2007) is the foundation of our work in early intervention and rehabilitation. It requires assessment of functioning in nine activity areas, domains, which are the same as in the ICF for adult populations. Five of them form the **Core Domains** that are the same as in the earlier WHO publication 93.27 **Management of children with low vision**. It was created during the meeting of representatives of WHO, several invited advisors to WHO and representatives of ICEVH (now ICEVI) before the world conference of ICEVH in Bangkok 1992. Its name refers to the need to improve services for children with low vision; blindness was never questionable and the services for blind children were well known and usually fairly well provided.

The important content of the WHO 93.27 publication and the ICF-CY is that they recognise the difference between classification of *vision impairment* for population-based surveys and assessment of *visual functioning* for rehabilitation services and special education. They require assessment of other visual functions than only visual acuity and visual field and stress the important fact that *vision disability is task/activity depended.*

A child with impaired vision often functions like a severely impaired individual in some tasks, like a mildly impaired in other tasks and like a child with normal sight in some tasks. This confuses people who do not know the nature of impaired vision causing them to say that the child "sees when he wants to", which is seldom true.



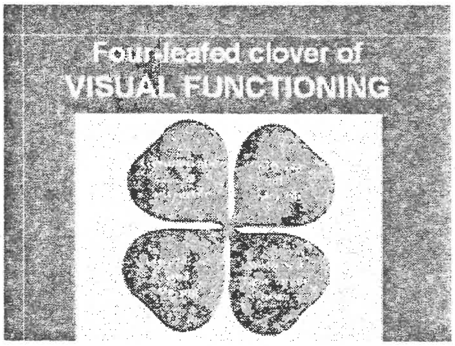
The ICF for classification of functioning in adult people lists several functional areas that need to be considered: learning and applying knowledge, general tasks and demands, communication, mobility, self care, domestic life, interpersonal interactions and relationships, major life areas, community, social and civic life.

Only five of the functional areas, domains of the ICF, are functional areas of infants and young children. These five are the same as where used in the WHO 93.27. It recommends assessment of vision in four main areas of functioning of children that exist in all cultures and in all age groups:

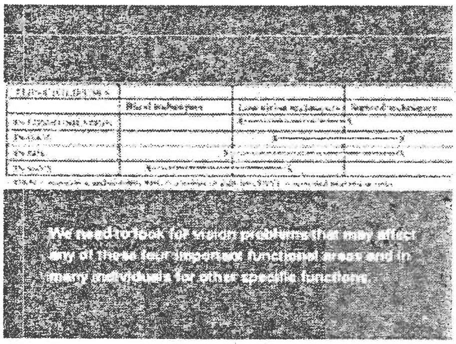
- Communication
- Orientation and movement
- Activities of daily living (ADL)
- Sustained near vision tasks like reading and writing.

Communication included also interaction, the fifth of the five Core Functions of the ICF.

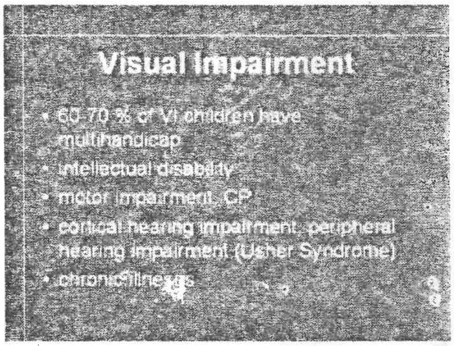
Visual functioning and abilities need to be assessed in each of these four areas so that we have a good foundation for planning early intervention and special education services.



To emphasize the importance of assessment in each of the four functional areas we have in Finland used this picture of the four-leafed clover since early 1980s (Hyvärinen 1985). In countries where clover grows, finding a four-leafed one among the usual three-leafed plants is thought to be a good omen or to bring good luck. If we remember to consider all four areas of visual functioning, it means really good luck for the child.

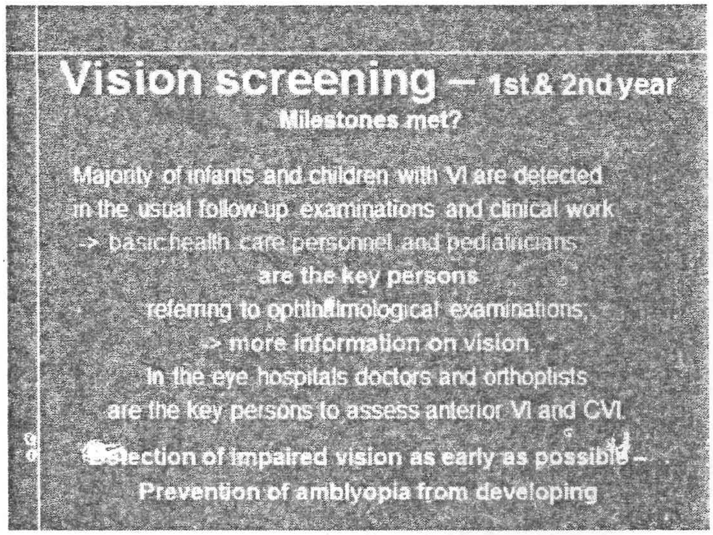


This graphic presentation of variation in visual functioning of children (and adult people) with vision loss is the most exact way of describing the nature of impaired vision. As we see here, this child with central scotoma is severely visually impaired in reading and other sustained near vision tasks that demand good recognition acuity but in other tasks (orientation and mobility, O&M, and activities of daily living, ADL) has enough vision to function like a fully sighted person. These situations where visual functioning is fair or good, the tasks are often related to use of the more peripheral parts of visual field where the function is quite normal. Even in normally sighted, the form perception is less accurate in the peripheral vision than in the central visual field. Other children may have normal central vision but limited visual field and among the children who have brain damage all usual clinical measurements may show normal values and yet the child is severely visually disabled.



In the detection and assessment of impaired vision we need to be aware of the fact that more than 60% of children with vision problems have at least one other impairment or chronic illness that affects their functioning. Therefore the groups of children where detection of impaired vision is most likely are the children with other diagnosed impairments. The largest groups are:

- children with intellectual disabilities
- motor impairments, especially cerebral palsy (CP) and
- children with hearing impairment, both peripheral and central hearing impairments and
- children with some syndromes (or) and some chronic illnesses.

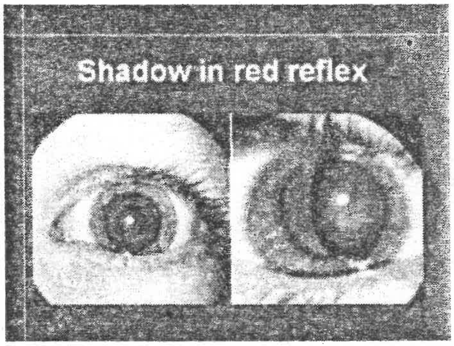


In most developed countries there are recommendations for practices to detect deviations from normal development of vision. The goal of early vision screening is to detect the few children who need to be operated early for cataract, glaucoma, abnormal eye lids or, most rarely, for turnours and to detect infants and young children who need spectacles already as young infants or are at risk of becoming amblyopic.

With the increasing number of infants with brain damage related vision loss it is important to be aware of the symptoms of unusual visual interaction and lack of reaching the usual milestones in visual functioning. The observations to be made should be embedded in the basic health care services. The nurses and doctors in charge of them shoud have the tools and the knowledge for observation of each milestone.

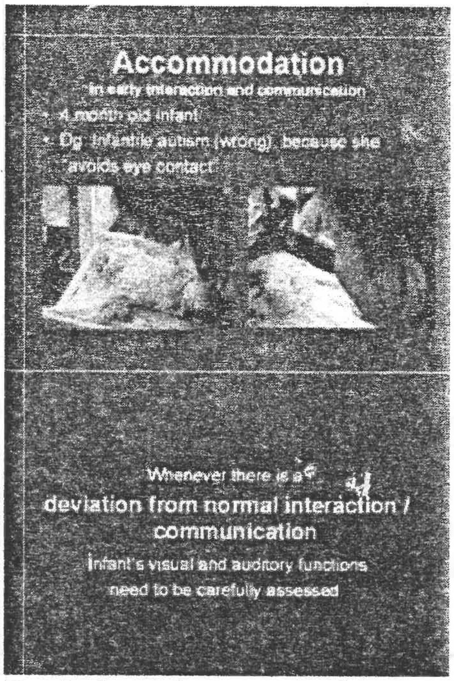
The workers in the day care, therapists, teachers and the families should also be aware of such facts as constant strabismus being an abnormal condition at all ages, that infections and inflammations need to be treated also in young infants and that delay in development needs to be investigated. The "wait-and-see" attitude is not acceptable.

The early development of vision and its deviations from norm are followed in many countries using modifications of the list in the pdfyou may keep on the wall for quick checking when you examine young children.



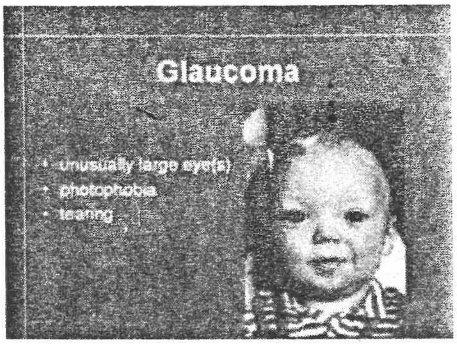
Shadows in the red reflex may be caused by cloudiness of the cornea, opacities in the lens (as in the picture to the left), dislocation of the lens (picture to the right) or vitreous floaters or remaining foetal structures in the vitreous. Infants with a large shadow in the red reflex need to be referred without delay to an ophthalmologist who can operate infantile cataracts, if that is the local policy. Monocular cataracts are not operated everywhere because the very demanding postoperative care, patching of the healthy eye and training of the operated eye, cannot be arranged. If the shadow is small and dilatation of the pupil can be used, operation may be postponed if the condition of the baby is not good enough for operation. There is thus variation in the care dependent on availability of surgical care, possibility of arranging the postoperative care and the general health of the infants.

Eye contact is an emotionally important function that may be present during the first days of life. Some new-born infants may copy even the basic expressions.
At the age of 8-12 weeks social smile and effective interaction between infants and their parents is expected.

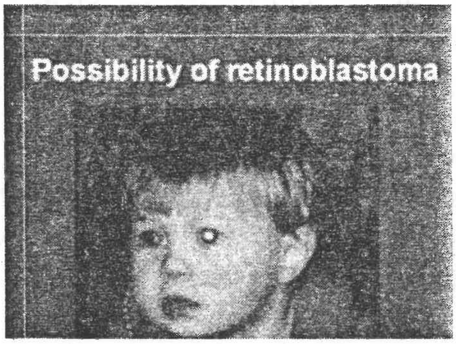


Deviations from normal development can be noticed during visits to health centre for vaccinations as in this case. The infant had no eye contact, seemed to actively avoid eye contact. This behaviour was present also when the infant was examined in the ophthalmologist's office. Dr. Lea diagnosed lack of accommodation and tested the child's functioning when the lack of accommodation was compensated with 'reading glasses', i.e. glasses that gave clear image on the retina of the infant. Immediately, the infant had eye contact with her mother and a normal social smile (video).

Whenever early communication/interaction is not normal, sensory functions need to be thoroughly assessed, in vision also accommodation.

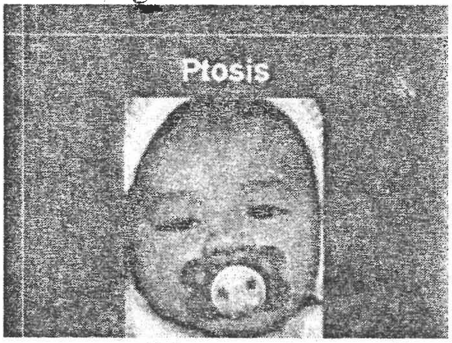


Large, "beautiful" eyes that are growing faster than usually should be detected in the basic health care services. Increased pressure may cause photophobia and tearing, sometimes rubbing of the eyes, which sometimes have been diagnosed as symptoms of allergic conjunctivitis. The diagnostic feature is the abnormally increasing size of the diameter of the iris.



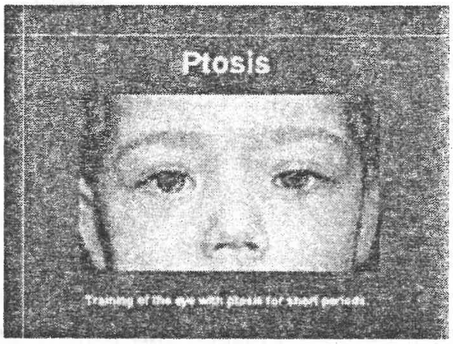
Retinoblastoma is a life-threatening tumour that may be present at birth but more commonly starts to grow in infancy or before school age. It is often detected first when it is visible as a white mass in the pupil or because the infant/child develops squint in an eye that has been well aligned for several months.

Sometimes an abnormal red reflex in a photograph brings the family to the eye doctor, as in this picture where the light is reflected from the optic disc, not from a tumour. Similarly the red reflex may be nearly white, if an eye has inward squint of 15-20 degrees (light is reflected from the disc) or there is coloboma, loss of a part of the retina, so that the light is reflected from the white sclera.



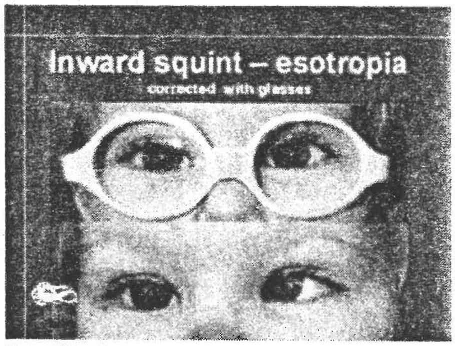
Drooping lid or ptosis may disturb development of binocularity and lead to amblyopia of the eye with ptosis. Therefore ptosis needs to be evaluated early in infancy. If the drooping lid does not cover the centre of the pupil, the optical axis, the risk of amblyopia is small during the first few months of life before the infant learns to sit.

In this case you can see the reflex of the flash in both pupil areas. It is not central in the right eye, which means that the eye was turning outwards. This infant was just about to fall asleep.



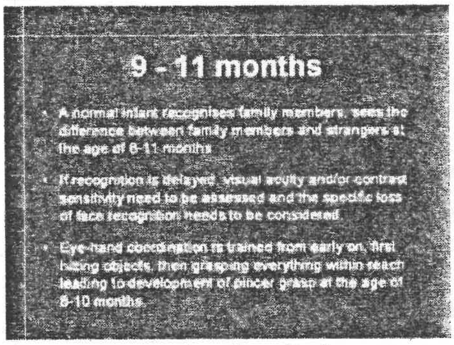
When the child starts to be upright, it is worthwhile to test now and then that the infant/child uses eyes equally, i.e. that covering the other eye that does not have ptosis does not disturb the infant more than covering of the eye with ptosis. The cover should only block the gaze, not touch the infant's face.

When the child grows, ptosis may become less disturbing. Even then it is wise to follow the development of visual acuity at regular intervals either at home, if the parents can take care of the measurement, or at the basic health care or in an eye doctor's office. In areas where there is shortage of the services of eye doctors, as many follow-up visits as possible should be arranged at the level of basic health care services or taken care by a nurse (or orthoptist if available) in the eye doctor's office.



Until the age of three months most children have eyes turning in or out for brief periods, which is normal. A *constant* turn of an eye or restricted movements of an eye are always an abnormal finding and the infant needs to be examined by an ophthalmologist.
After the age of six months squint, strabismus, especially inward squint, should not occur more than briefly when the child is tired, or the outward squint when the child is thinking on something, not looking at anything and the eyes turn in their sleep position (s.c. Bell's phenomenon, eyes turning out and up during sleep, which prevents corneas from drying if the lids are slightly open).
In many cases the cause of an inward turn of an eye is hyperopia, long sightedness. Proper corrective glasses straighten the eyes and development of vision can continue normally. Early detection of strabismus and support of normal development by glasses and follow-up of the development have decreased need of surgery in several countries.
In the lower picture the reflexes of the flash can be seen in the centre of the pupil in the right eye and at the edge of the pupil in the left eye. When the angle of squint is so large as in this case, the position of light reflexes (=Hirschberg test) is easy to record.

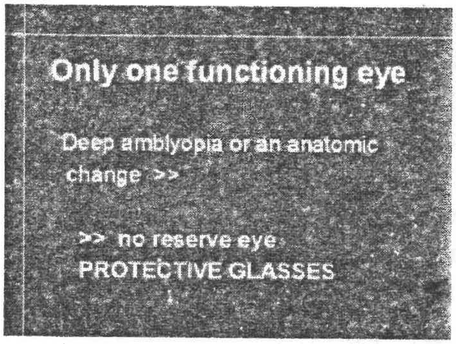
Pseudostrabismus is the most common false diagnosis related to vision development at the level of basic health care. If there are nasal folds covering the inner part of the sclera in both eyes, the child may seem to have esotropia, inward squint. Especially, when the head is slightly turned (to the right in this case), the eye seems to be squinting inward. However, it is better that a few children without strabismus are referred than that even one child with this treatable condition is not examined by an ophthalmologist.



Toward the end of the first year infants start to recognise family members by their faces and by their voices, if vision and hearing are normal. If an infant does not respond to family members differently from responds to strangers but does recognise their voices at the age of 10-11 months at the latest, vision needs to be carefully assessed. The infant may have large refractive errors or other causes that decrease image quality so that faces are not perceived well enough or there is a specific loss of face recognition. The faces are not perceived and recognised because the specific brain function has not developed.

Eye-hand coordination may not develop as expected. In a normally developing infant it starts as watching the hands and bringing them to the midline and into the mouth. Then the infant starts to hit hanging toys, which develops to grasping objects and exploring them with hands and mouth. At the age of six months many infants have a nearly compulsive desire to grasp everything within reach and hold it tight.
In these two important areas of development, deviations from normal age appropriate behaviours are common in children with brain damage related vision loss.

Accidents, especially traffic accidents, may cause loss of vision because of damage to the eye or optic nerve or because of brain damage. In this case there is right sided paresis of facial nerve, blind, non-moving right eye and deafness of the right ear. It will be possible to investigate first later when the child grows, whether there will be functional changes related to brain damage.



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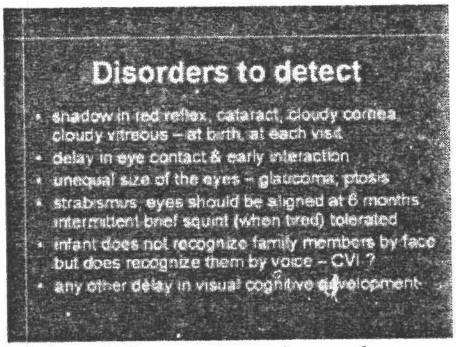
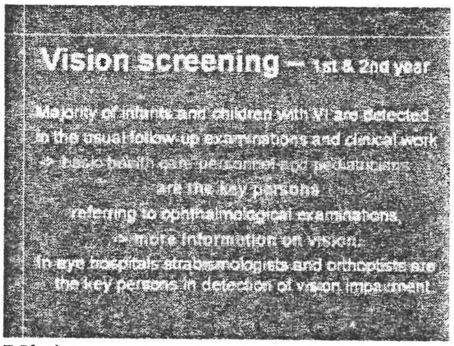


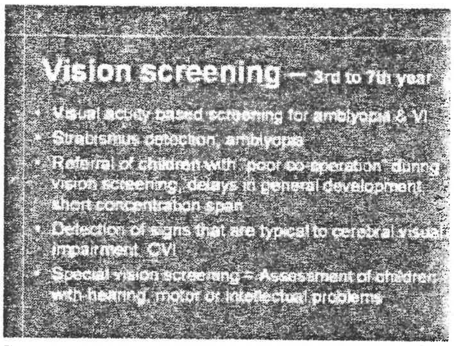
This slide summarises the most common deviations that should be detected during the first year of life so that the infant is treated and has adequate early intervention.

- shadow in red reflex, cataract, cloudy cornea, cloudy vitreous – at birth, at each visit
- delay in eye contact & early interaction
- unequal size of the eyes – glaucoma;
- ptosis
- strabismus, eyes should be aligned at 6 months, intermittent brief squint (when tired) tolerated
- infant does not recognize family members by face but does recognize them by voice –specific loss of face recognition or poor quality of image
- any other delay in visual cognitive development



Vision screening is best organised as a part of the basic health care, not as specific separate activities. The key persons in screening are health care centres in countries with national health care, in other countries doctors, general practitioners and paediatricians and the nurses working with the doctors or as independent health care practitioners. Many children, who have brain damage related vision loss, have *strabismus* and are therefore referred to ophthalmologists. If the infant has normal eyes, it is often forgotten to evaluate, whether the infant might also have brain damage related vision loss (CVI). At the hospital level ***orthoptists and strabismologists***are the key workers in the early diagnosis of CVI. Similarly, doctors taking care of***infants with ROP***should know that there is an increased risk of brain damage and vision loss in these infants.

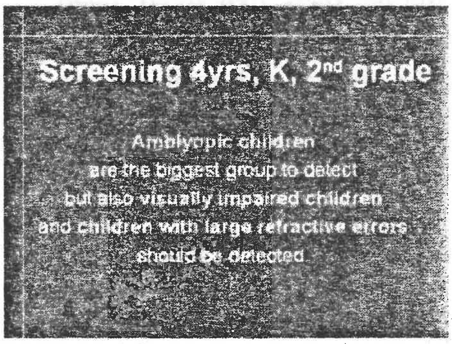
If an infant has an anterior visual impairment, it does not prevent the infant from having also brain damage.



In preschool years, general vision screening based on measurement of visual acuity is most usual at the age of four years because at that age nearly all normally/ typically developing children can be tested during the first examination. If there are worries about the visual acuity, most children can be tested with single symbol LEA tests before the age of two years and soon after that age also with the screening line tests.

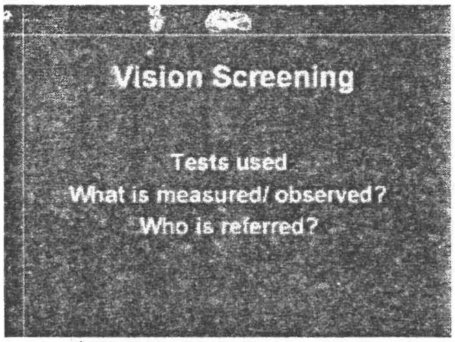
Children who "do not co-operate" or "have short attention span"should be tested twice and if their testability does not become normal, they need to be referred. It is important to rule out that their poor functioning in the test situation is not caused by poor vision. If their vision is found normal they need to be referred to a paediatric neurologist.

Children with intellectual disabilities are likely to fail the screening examination and need to be examined by an ophthalmologist **even if they have been examined by an ophthalmologist as an infant**. Likewise children with motor problems and children with hearing problems need to be referred. There is no screening method that would cover all the aspects needed for detection of children with vision problems in these groups of children with special needs. CONE Adaptation test can be used in health examination of hearing impaired children to detect retinitis pigmentosa early, which is important for the planning of special education.

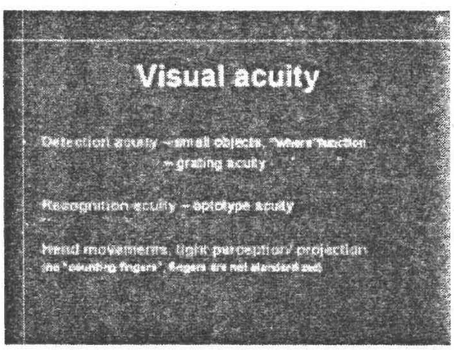


In the vision screening at preschool age, at 4 years and at kindergarten and during the 1st or 2nd grade, amblyopia is the main finding in many countries, although it should have been treated by then, but also large refractive errors and children with visual impairment may be detected. New cases of visual impairment are usually children with retinal degenerations with normal looking eyes. Brain damage related vision loss may not cause changes in visual acuity and therefore all *common* *symptoms of CVI* should be included in the questionnaire used in the examination of development at the school. When the children grow, more subtle deviations from normal visual functioning can become noticeable. Teachers are usually not well aware of cognitive vision losses, which may cause misunderstandings and major difficulties in learning, if not recognised and compensated with special education.

Children with other impairments need to have their vision examined by an ophthalmologist who is accustomed to assess handicapped children and works in the local rehabilitation team. Many children need to have **the test situations trained as a part of teaching** in kindergarten and at school so that their visual functioning can be assessed.



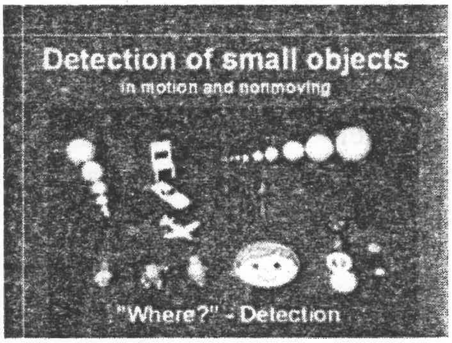
In vision screening we need to decide **which tests are used,** need to know **what they measure** and **which other observations need to be made**. We also need to decide the pass/fail criteria. Often it is wise to allow the screeners to refer those few children, of whom they feel that there might be something wrong with the child ("gut feeling"), even if the child passed the screening tests.



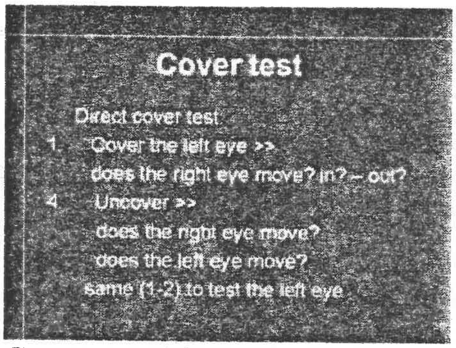
Visual acuity measurement is the most often used test in vision screening in preschool and in school age. In infancy visual acuity can be measured only as response to gratings, which is not used in vision screening.

Visual acuity can be measured with optotype tests when the child can match the test symbols. With LEA Symbols it is possible to train an infant to match them soon after the first birthday. After training with the LEA 3D Puzzle the measurement of binocular visual acuity has been possible at the age of thirteen months in a few infants and more often after the age of 18 months.

By bringing the distance test with 30M optotypes to 30 cm (one foot) distance, it is possible to measure visual acuity values to 0.01 (6/600, 20/2000) and by bringing it still closer, even lower than that. If the largest symbols cannot be recognized at the closest distances, there is no form perception. Then visual acuity can be "detection of hand movements" or only "perception of light" with or without projection, i.e. awareness in which direction the light source is. (Counting fingers is an inadequate way of reporting sharpness of vision because fingers are not calibrated and the background against which the fingers are shown is not a standard surface.)



In Nordic countries we have used a collection of small items to assess detection of small objects. In this slide we see Sheridan balls and toys, colourful small balls, Muumintroll figures and soft sweets of 12 different sizes. (Black-and-white copy of this slide was used in the textbook "Assessment of Vision in Children" by Hyvärinen and Lindstedt, 1981).

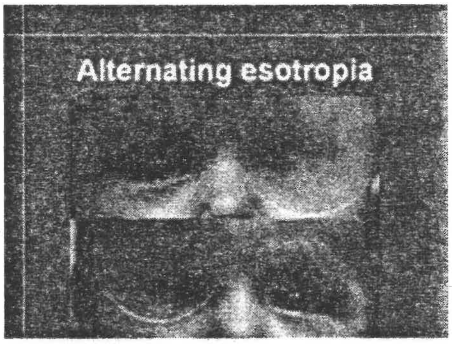


Cover test (shown in the next slide) is used in many countries to detect small angle strabismus and differences in the central vision between the eyes. When an eye is covered, the tester observes what happens to the uncovered eye. If the uncovered eye was *not* looking at the picture on the fixation stick, it will move to fixate the target, i.e. there is *a corrective movement.*

When the strabismic eye is covered, there is no movement in the leading eye.

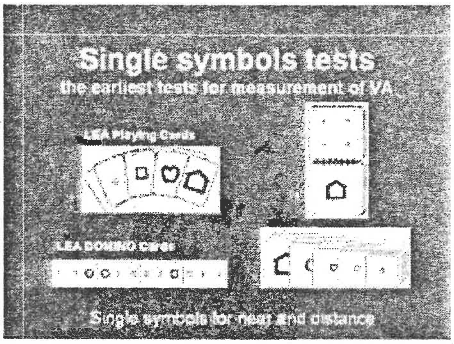
If the strabismic eye has developed an eccentric fixation, it may not move during cover test but a slight difference in the position of the light reflexes (Hirschberg test) may be present. These small angle squints are so difficult to detect that often the condition is diagnosed first when visual acuity can be carefully measured until threshold (until the smallest line read correctly).

If there seems to be a small angle squint in a toddler, it is worthwhile to teach the child to function in the test situation before trying to test visual acuity. A difference in visual acuity values can often be measured at the age of two years with line tests if the child has trained at home.



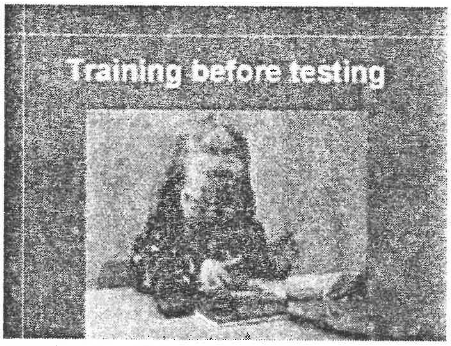
This child has esotropia, inward squint, but uses both eyes equally well, which is called alternating esotropia. When the fixating eye is coved, the squinting eye fixates steadily on the fixation target and remains fixating when the cover is removed. Cover needs to be held in front of the fixating eye until the squinting eye has fixated the target. Again enough time needs to be given to observe that the previously squinting eye keeps fixation when the cover is removed from front of the other eye. These children need to be referred so that their refractive errors will be measured and the possibility of treatment with glasses and/or operation is considered.

Lang stereo test is used in some countries as an adjunct to visual acuity measurements. As long as the child cannot tell which pictures there are, the response is difficult to assess. An obvious, stable fixation at the pictures and shift from one to the other and back can be observed as early as at the age of four and half months in visually alert infants.

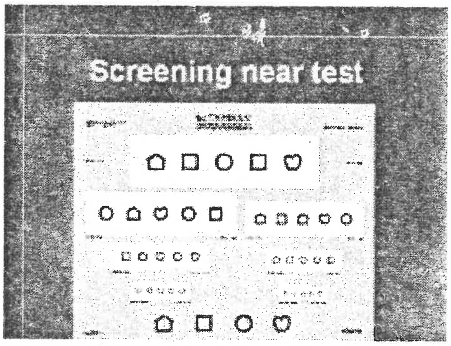


Vision screening at the age of four years is designed for detection of amblyopia. The *target population of amblyopia screening are symptom free children.* If a child has symptoms of any kind (strabismus, squeezing eyes during testing, head tilt or turn, itchy or red eyes etc.), (s)he is referred for treatment independent of visual acuity values.
Visual acuity can be measured with single symbols quite early, the earliest at the age of 13-16 months. Single symbols do not detect amblyopia as well as line tests but large differences in visual acuity between the eyes can be detected.

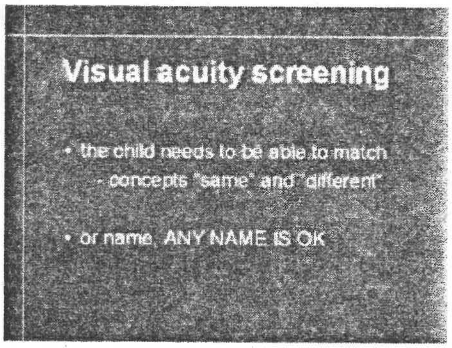
Training with the 3D Puzzle helps the child to develop the concept same/different first between colours, then between black-and-white concrete forms, then making the big step comparing 3D forms and flat pictures.



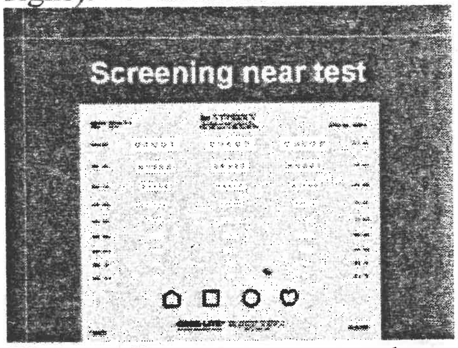
Training is especially important in testing children with delays in development. Information for Parents ->Training for vision testing



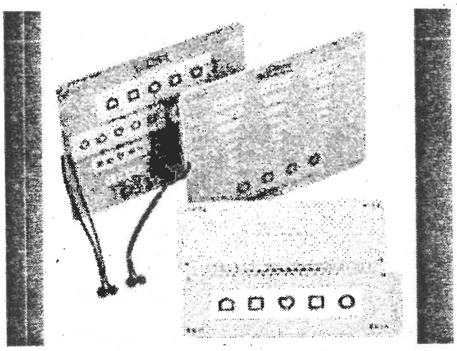
Screening visual acuity tests are easier than the standard line tests. The lines are further apart and the grey surface decreases dazzle in photophobic children. This type of test is faster than the standard test and easier for the tester and the child to know on which line to read.



Children answer either by matching or naming (using spoken words or signs). For detailed instructions see:

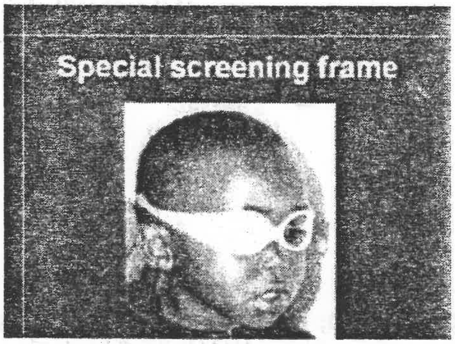


The smaller lines are on the reverse side of the test until 1.25 (6/5, 20/16) line.

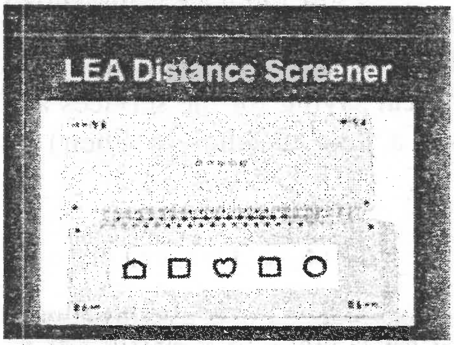


After measurement of the binocular near vision acuity, the child is shown the distance screener and told that the same pictures will be shown at a greater distance. Binocular and monocular values are measured. If covering of the left eye (which is usually covered first) causes a strong negative reaction, cover the right eye first.

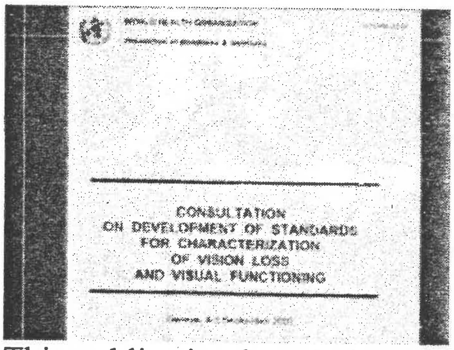
It is important to keep in mind that *skipping symbols is a feature typical to amblyopic eyes*. Even if the visual acuity difference is less than two lines between the eyes, it may be an important finding. If one notices that the child has motor difficulties, like skipping symbols, the tester should be alerted to the possibility that the child might have beginning mild amblyopia developing in an eye or has undiagnosed brain damage.



Covering is easiest with this special "Screening frame" that can be used to cover both eyes in turn. It is easy to wipe clean and can be used for years. The screening frame comes in two sizes and in several colours, of which the dark purple seems to be the favourite of many children. It blocks the vision of the covered eye more completely than the white one, which lets some diffuse light through it.

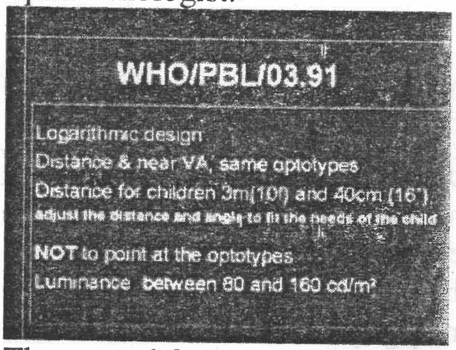


In the distance screener there is only one line on each page to make it easier for the child to know where to read. If however, the child makes an error and starts to read the line a second time, there is another page with the same size of optotypes for this situation. In screening a line should be read only once. The tester may say to the child "Let's take another line of similar pictures so you read it without hurrying."



This publication by World Health Organisation, WHO/PBL/03.91, was published in August 2004 and describes the recommended routine in measurement of visual acuity in population-based surveys, and thus applies also to paediatric vision screening.

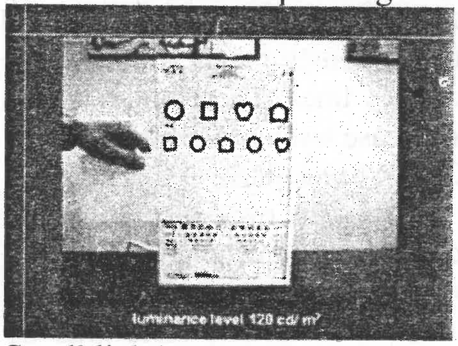
One of the most important recommendations is **measurement of visual acuity at near**. It recognises the importance of near vision in all functioning. Measurement of near vision with optotype tests is not common in all countries but is warmly recommended, because with this simple measurement at near we can diagnose that a low visual acuity at distance is related to myopia, the child has normal visual acuity and does not need to be referred, which means a great saving for the services and also for the parents, if they must travel a long distance to (their) an ophthalmologist.



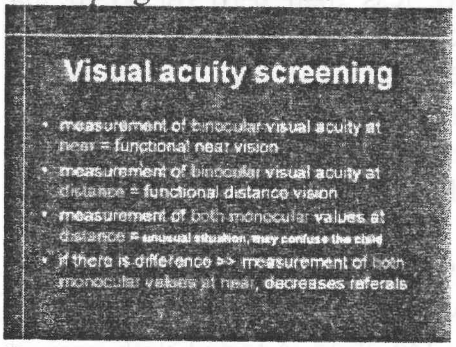
The central features of the **WHO** document are:

- All tests of visual acuity should have logarithmic design.
- Both near and distance vision should be measured with tests using the same optotypes. (In many countries near vision is measured only using texts.)

- The distances for paediatric testing are 10 feet and 40cm. When testing a visually impaired child, test distance and angle are chosen to meet the needs of the child.
- **Pointing at the optotype to be read is not allowed,** because it helps the amblyopic eye to fixate better and thus decreases the likelihood of detecting amblyopia early. Covering the line above or pointing at the line to be read are acceptable testing methods.
- Luminance on the test surface should be between 80 and 160 candelas per square meter. This level is difficult to get on vertical surfaces except on lightboxes.



Small lightboxes solve the problem of standard illumination. The present generation of lightboxes uses diodes instead of a lamp. Therefore they have stable luminance and tolerate traveling. The slide shows the technique of covering the line above the line to be read. The end of the cover is slid between the test and the frame of the lightbox, which helps in keeping it horizontal.

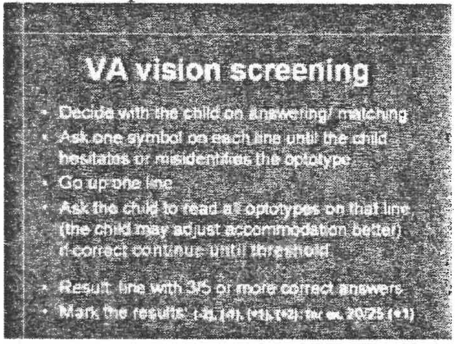


To summarise the visual acuity screening: the word "binocular" is used here to mean 'both eyes open'

- 'Binocular' visual acuity at near to measure the functional near acuity.
- 'Binocular' visual acuity at distance to measure the functional acuity at distance.
- Monocular visual acuity of each eye to find difference in distance visual acuity between the eyes.
- If there is a difference, then measure monocular acuity of each eye at near. If the near acuities are equal or the difference is less than two lines, the acuity values should be measured a second time the same day or within a few weeks, if that is more comfortable.
- Normally sighted children's visual acuity values, when measured twice in the same room using the same instruments and the same testing technique may vary two whole lines. Therefore a second measurement is well-founded to decrease wrong referrals.

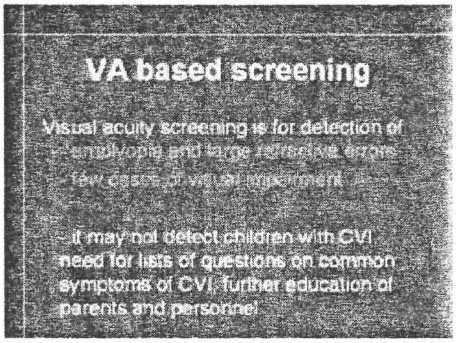
The pass/fail limit has been 0.5 (6/12, 20/40) binocularly at distance and near and less than two lines difference between the eyes at distance and near, when visual acuity was measured until threshold.Clark et al study showed that if the visual acuity of the worse eye was 0.5 (6/12) or better and that of the leading eye 1.0 (6/6) or better, there was no statistical difference in the results of treatment when the treatment was started at the age of four years compared with results of treatment that was started at the age of five years. This can be interpreted so that glasses and training may be postponed by a year in this group of children with mild amblyopia, if treatment is found problematic. The study did not include children with visual acuity less than 0.16 (6/36) in the amblyopic eye. In the group of children with visual acuity 0.16 – 0.3 (20/125 – 20/63; 6/36 – 6/18) in the amblyopic eye, full treatment showed substantial effect. The results thus show, that the delay in treatment is justifiable only in the mildest cases of amblyopia. However, the more severe cases need to be treated and thus screening should be at four rather than at five years of age.

In many cases, when the difference between the two eyes is two whole lines, there is no real amblyopia or it is very mild, because the difference in visual acuity values disappears when the child is tested with proper refractive correction or (s)he has had glasses for less than a month. Therefore visual acuity values should be measured with *optimal* correction after the cycloplegic measurement of refractive errors. Optimal correction is not equal to full correction in most cases.



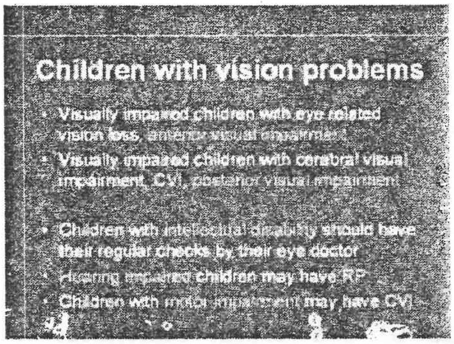
The important details are:

- Decide with the child the mode of answering: matching or naming, any names are OK. To decrease the time used for testing, ask only the first optotype on each line or each second line until the child hesitates or answers incorrectly. Go up one line and ask the child to read all optotypes on that line. (This allows the child to focus carefully, after which up to two more lines may be read correctly.)
- Continue until threshold, i.e. at least three out of five optotypes are read correctly. If only two out of five are read correctly, record the result: visual acuity of the previous line (+2).



Visual acuity based screening is designed to detect amblyopia in healthy children. It detects also a few cases of high refractive errors and an even smaller number of children with visual impairment.

It is unlikely to detect visually impaired children with brain damage related vision loss, if their visual acuity values are normal. Therefore the nursery school and kindergarten teachers should have training in observing strategies and behaviours typical to vision loss due to "hidden" brain damage.

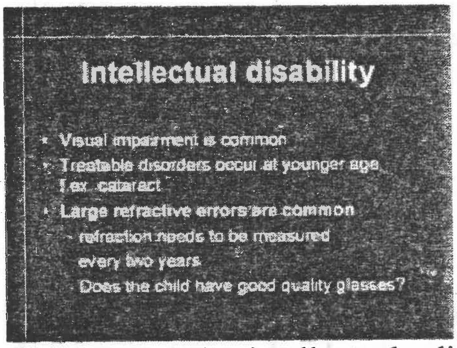


If there is a larger than usual difference between visual acuity at distance and visual acuity at near, it is worth-while to measure visual acuity values with the more crowded near test to find out, whether there is increased crowding.

If there are any of the typical features of cognitive vision loss (pdf), the child is referred to thorough ophthalmologic and neurological assessments. The earlier we find *processing problems* (CVI), the more time there is to find compensatory strategies before the school age. Cognitive vision loss is often more problematic in integrated education than vision loss caused by lesions in the eyes and/or optic pathways that affect *image quality*. Processing problems cannot be demonstrated with demonstration glasses that can approximately depict the nature of poor image quality (Part I/ Demonstration glasses).

In vision screening there are seldom children with undiagnosed visual impairment, most cases have been found (should have been found) in infancy, if present from birth. Some inherited disorders manifest themselves between four and ten years of age, so age normal visual acuity values do not guarantee that the child has normal vision. The age norm is low, 0.5 with both eyes open. Many normally sighted children read 1.25 (6/5, 20/16) line at the age of four years.

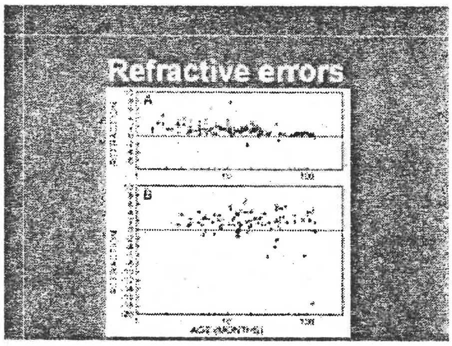
Because the visual acuity screening is only screening, it is not wise to predict any forms of treatment based on the results of screening. Need of treatment is evaluated after thorough clinical assessment of the child's vision.



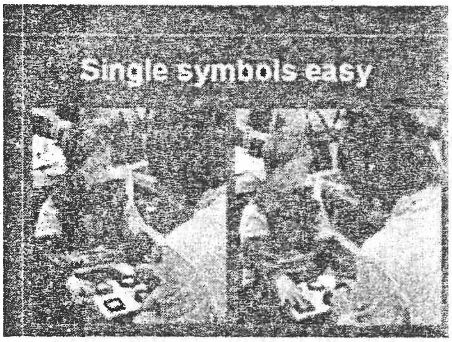
Children with intellectual disabilities (ID) are assessed by an ophthalmologist at the time of the diagnosis of ID or at the age of 3-4 months to diagnose refractive errors and weak accommodation. The follow-up of infants and children with Down syndrome is the same as that of their peers.

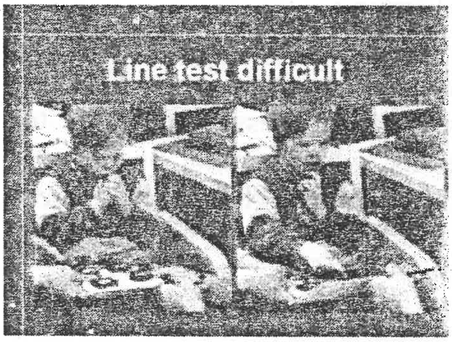
At the age of four years some of the best functioning children with developmental delays can be tested with the routine screening tests. It is good to try to test all children with ID to collect information for planning of special education. These children need to be examined by an ophthalmologist because they are likely to have problems more often than children with normal development of intellectual functions. Cataracts may develop in preschool and school age, squint is common and processing problems are difficult to diagnose because of communication problems. Among the children with severe intellectual disability at least half of the children have vision problems that need to be treated because the disorders disturb learning.

It is good to check that the glasses are of good quality. Unfortunately, these children often have glasses that glide along the nose so the child looks over the glasses much of the time. Bifocal glasses may have too small and too low placed near corrections, which cannot be properly used by the child. (Such glasses I do not call 'eye glasses' but 'cheek glasses'.)

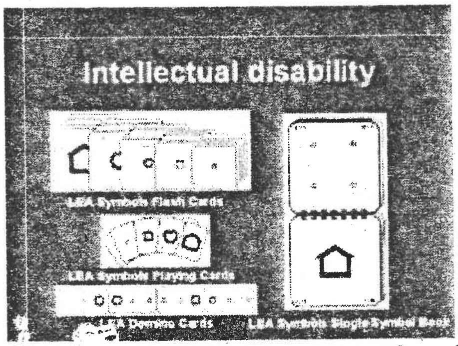


Emmetropisation of refractive errors, which means decrease in the size of refractive errors, is a typical feature in the development of normal children. Young children are more far sighted than school children. This shift in the refractive power is not common among children with Down syndrome. (This slide is based on two slides of Margaret Woodhouse)

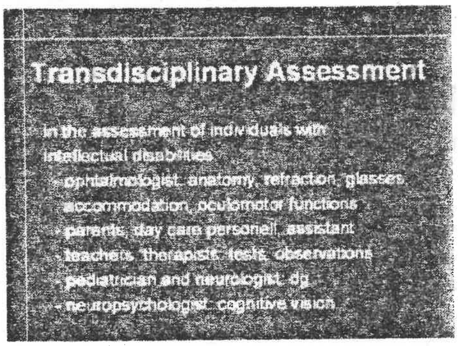




At the age of four years many children with ID can be tested with single symbols but testing with line tests takes time and children easily lose their motivation.

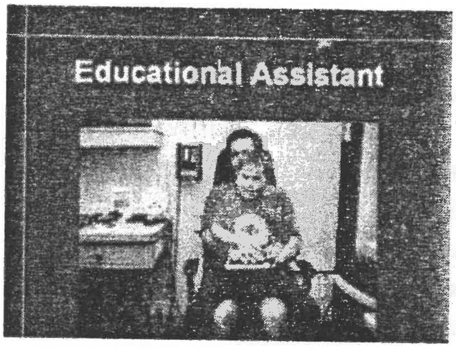


Single symbol tests must often be used still on the 2nd grade, in some cases through the school age, if a child can handle pictures of concrete objects (optotypes of LEA tests) but not pictures of such abstract symbols as numbers and letters.

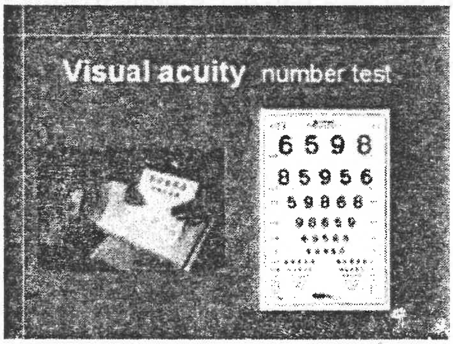


Transdisciplinary assessment seems to be the strategy that works best in the assessment of visual functioning of children with delays in development. Transdisciplinary means closer collaboration than interdisciplinary. The team members know the most important test situations and are able to use the tests as a part of daily activities and classroom work. The test situations need to be repeated with regular intervals because a child may have been tired, hungry or nervous when assessed in the doctor's office. On the other hand, the test situation in the doctor's office may have been calm and relaxed and the measured values good when there were no distracting factors. The child may not be able to function at the same level in an integrated school situation with visual and auditory noise around.

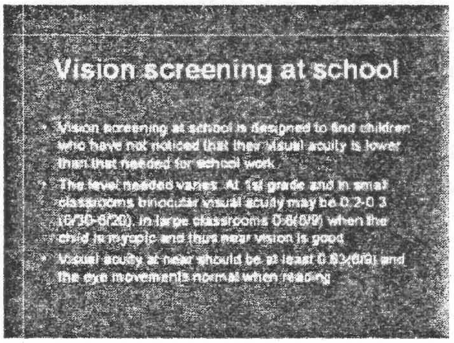
This is a typical transdisciplinary test situation. Communication is led by the teacher who knows the support signs and dialect of the child, the ophthalmologist is out of the sight of the child and only changes the test cards without saying anything. Observation of the child's behaviour is easier when someone else is in charge of the communication. Most people can either communicate well, be absorbed in the interaction with the child or they can observe well, very few people can perform in both activities simultaneously. – Note, that the child uses the sign "good" when she is able to match the picture on the card with the similar 3D puzzle piece.



In school age a child's assistant is often the person who can keep the child's concentration in the tasks related to testing: not through a normal test, but at least during two or three answers.



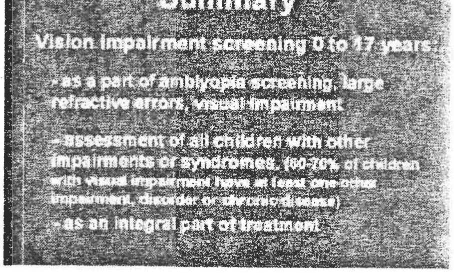
In vision screening at school, number or letter charts are used in the Western world. The Roman letter charts do not function in countries where other characters are used. Therefore numbers are a more suitable set of optotypes in comparative studies of visual functioning covering several cultures. Like the LEA Symbols, also LEA Numbers have been calibrated against the Landolt C, the international reference optotype since 1988.



Vision screening at school-age is different from vision screening in the preschool. Amblyopia should have been diagnosed and treated before school age, new cases of vision loss are rare, so the goal of vision screening is to find the children who have not noticed that they have difficulties in classroom work because of blurred images. There is no general pass/fail level in visual acuity values because the school situations vary so much. A small myopic child who can sit in the front row may have no problems in classroom work before his/her binocular visual acuity is 0.2 – 0.3(6/30 – 6/20; 20/100 – 20/60), whereas a tall child may need glasses when binocular visual acuity is 0.8 (6/9 – 20/60), if (s)he must sit in the back of the classroom and teacher's handwriting and projected texts are small.

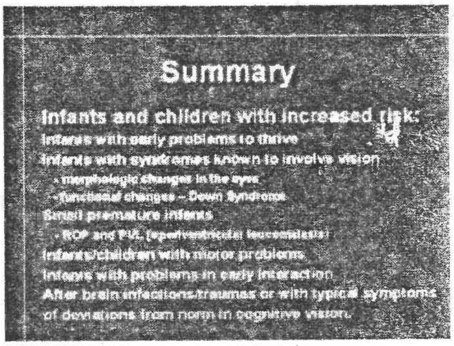
Children with severe motor problems need to be assessed at school, where their physiotherapists can support the children during testing. If a child cannot talk, gaze pointing may be used in matching. A child may also be able to point with foot or by turning head toward the correct answer of two choices. Severely impaired children cannot be screened like their normally functioning peers. Instead they are always assessed when other children are screened. Special education requires also 'special screening' and special assessment. Special screening is for example testing for visual adaptation to lower luminance at schools for the deaf children, because retinal disorders are common and not otherwise noticeable during the first years at school

SUMMARY



As a summary:

Vision screening to detect visual impairment is a small but important part of general vision screening to detect amblyopia or risks to develop amblyopia and large refractive errors. "Screening of children with special needs" means thorough ophthalmologic assessment of each child with a disorder that causes a high risk of impaired vision, training of children for testing and good transdisciplinary efforts with day care, nursery schools, kindergartens and grade schools.



Since more than 60% per cent of children with impaired vision have other impairments, detection of visual impairment among children known to have other impairments is the most effective way of detecting visual impairment and large refractive errors early. These children are usually in intensive medical care during the first year of life. Thus it is not difficult to arrange that each child is thoroughly assessed. When early diagnosis is a part of basic paediatric care, it does not cause economic problems and it improves the care of the child and planning of special education.

CHECK YOUR PROGRESS

1. What is curriculum? How to create curriculum for developing attention, perception, motor ability for visual impaired children?
2. What points would you take into consideration to develop alternate curriculum for the development of language skills in those with sensory handicap.

3. Design curricula for developing the following skills in disability condition of your choice:
   (d) Reading skills
   (e) Arithmetic skills
   (f) Writing skills

ASSIGNMENTS

- Plan a curriculum to develop skills in reading comprehension in 10 yrs. old child with LD (ADHD).
- Design a curriculum to develop pre-language skills in a 8 yrs. old child with pre-linguial deafness.
- You have started an early intervention clinic. Plan a curriculum for children with VI, CP, & MR to optimize their development.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop and Sarah Lyman Kravits. (1998) — Keys to Success. How to Achieve your goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986) — The child's Language and The Teacher – A Handbook.

3. Lyndon W Searfoss Helping Children Learn To Read.
John E. Readence (1994) Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The Trainers of the Mentally Retarded Persons.
Pub.: NIMH Sewnderabad.

5. Paul A Albeoto Applied Behaviour Analysis For Teacher
Anne C Troutman (1990) Merrill Pub. Co. ohio 43216.

UNIT – 5: FUNCTIONAL ASSESSMENT PROCEDURES

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

This section has links to information about Functional Vision Assessment, a crucial early step in planning for the education of a student with visual impairment. These resources explain the procedures, techniques, and importance of the assessment.

Below is a list of topics you'll find in this section. Click on a title to jump to a specific topic.

- Functional Vision Assessment: Introduction
- Functional Vision Assessment: Organizations and Resources to Explore
- Functional Vision Assessment & Multiple Disabilities
- Functional Vision Assessment Forms

Functional Vision Assessment: Introduction
Assessment of Low Vision for Educational Purposes and Early Intervention
Lea-Test, Ltd.
The importance of understanding functional vision when selecting techniques for early intervention and classroom strategies.

Functional Vision Assessment (2006)
Provincial Centre: Special Education Technology
An overview of the essential components of a functional vision assessment, with helpful examples. Includes printable assessment worksheets.

Functional Assessment
Low Vision Online
Includes a definition, a list of eight areas for assessing functional vision, including color vision, contrast sensitivity and lighting needs.

Functional Assessment of Vision
Scottish Sensory Centre
Lists the seven functions that comprise the spectrum of visual functioning.

Functional Vision Assessment (FVA)
Family Connect for Parents of Children with Visual Impairments
Includes links to assessments; discusses the role of teachers and tests.

Functional Vision Assessments, Vision Australia
Vision Australia
A functional vision assessment helps parents understand their child's visual abilities and how to make the most of them in various settings.

Functional Vision Assessment Second Workshop
Provincial Resource Centre for the Visually Impaired
http://www.prcvi.org/files/workshops/FVAhandouts.pdf (Handouts)

http://www.prcvi.org/files/workshops/FVAslideshow.pdf (Slide show)

Darick Wright explains the essential components of a functional vision assessment and illustrates them with specific examples.

Specific Assessments for Students with Low Vision
American Foundation for the Blind (AFB)

Explain the importance of comprehensive evaluations by members of the student's multidisciplinary team, including assessments of functional vision, expanded core curriculum, appropriate learning media, and ophthalmologic and optometric evaluations.

What is a Functional Vision Assessment?
SESA (Special Education Service Agency)

An overview of the functional vision evaluation and training of staff to implement the program modifications and adaptations.

One of the most important prerequisites in planning a student's educational program is assessing the student's strengths and weaknesses. Assessment for students with low vision includes comprehensive evaluations by members of the student's multidisciplinary team. Areas of assessment summarized in the following paragraphs include: functional vision assessment, expanded core curriculum assessments, learning media assessments, clinical low vision evaluations, and ophthalmologic and optometric evaluations. These tests are specific to vision related fields. State tests and standards of learning for students' with low vision are not addressed in this fact sheet.

Legislation

The Code of Federal Regulations (34 CFR), sec. 300.532: Assessment/Low Vision Assessment and Evaluation states that state and local educational agencies shall ensure that, at a minimum, tests and other evaluation materials must be validated and tailored to assess specific areas of educational need for individual students with visual impairments. Students must be assessed in all areas related to the suspected disability.

Individualized Education Plan (IEP)

Children and youth with low vision have unique educational needs. Research documents that these students often require direct instruction by a teacher for students with visual impairments in areas that are not typically addressed for other students. All students who meet the criteria for visual impairment within their state should have a document that addresses their individual needs. This document, called an Individualized Education Plan (IEP), is used to place a child in the most appropriate educational setting. A thorough assessment for students with visual impairments is the key in creating an adequate IEP. And the assessment process is an essential component in developing appropriate goals and objectives for the student. The following are the most common evaluations given to students with visual impairments to guide their program planning.

Expanded Core Curriculum

The core curriculum designates the minimum standards students must meet in order to advance to the next grade level. Examples of core curricular areas are mathematics, reading, and science. Modifications and adaptations are needed to make these curricula accessible to students who are visually impaired. The **Expanded Core Curriculum (ECC)** covers additional areas of learning not addressed in the core curriculum that must be assessed and taught for students who are visually impaired. These areas include concepts and skills that are often learned incidentally by sighted peers. Areas of the Expanded Core Curriculum include: orientation and mobility, social interaction, recreation and leisure, use of assistive technology, independent living skills, career education, visual efficiency, self-determination, and compensatory academic skills, including communication modes. A teacher for students with visual impairments must assess each area before beginning a student's educational plan. Evaluations in the areas listed above are critical in order to identify and address weaknesses in the student's repertoire. Students with low vision are often able to pass as being competent in areas of the expanded core because their difficulties are less apparent than those students who are blind and have not received any ECC instruction. Teachers for students with visual impairments must not overlook the needs of these students with low vision when assessing areas of the expanded core curriculum.

These nine areas of the Expanded Core Curriculum can be approached differently for students with low vision and students who are blind. For example, in orientation and mobility instruction, a student who is blind would focus on auditory and tactile cues, while the student with low vision would augment these cues with visual information obtained from the environment. The ECC area of visual efficiency for a student with low vision may mean learning how to use optical devices correctly. However, a student with no vision does not benefit from this training. Although areas of the expanded core curriculum can be very different for students with low vision and for students who are blind, assessment and instruction is equally important for both.

Assistive Technology Assessments

Assistive technology, an area of the expanded core curriculum, refers to any product or service that is used to increase, maintain, or improve functional abilities of students with low vision. Technology assessments address a student's need for such equipment as screen readers, screen magnification, scanners, adaptive keyboards, portable notetakers, closed circuit televisions, augmentative communication devices, braille translation software, braille embossers and braille writing equipment. Assessment in these areas is essential to ensure the appropriate match of technology to student's needs.

Functional Vision Assessments

The functional vision assessment includes a variety of evaluations that test the child's use of vision and visual efficiency in daily activities. The assessment, administered over several sessions, determines how the child accesses his/her visual environment, such as how far s/he can sit from the chalkboard or what print size s/he is able to see. A certified teacher of students with visual impairments completes the assessment; contributions from the child's Orientation and Mobility instructor are helpful as well. Parents, caregivers, and the child's teacher(s) are asked to give input about how the child performs in the community and the school setting. From this assessment, a report is generated that addresses multiple issues:

- **Near and distance acuity:** An acuity measurement is taken at near range (usually at a distance of 16 inches) using a near vision acuity chart. This measurement is often recorded in print size. For example, the teacher may record that the child can read 2M print (large print) at 16 inches. Other functional near tasks might also be used in the evaluation (e.g., how the child accesses information on baseball cards, identification of coins, etc.). Distance visual acuity is typically measured at a distance of 10 or 20 feet. A distance vision chart such as the Feinbloom or Snellen is often used. Other functional distance tasks may include the distance at which the child can see print on the whiteboard or imitate hand movements given by the physical education teacher.

- **Peripheral visual field:** Peripheral vision is the ability to see movement or objects outside of the immediate line of vision. Field loss is measured in degrees. For example, if a child has a 20 degree field loss, his/her visual field does not extend through a complete 180 degrees left to right.
- **Reading level and speeds:** An informal reading inventory indicates the grade level at which a child is reading as well as how fast s/he is reading in comparison to her/his peers.
- **Current print functioning:** The functional vision assessment should state the child's primary mode of reading, whether it is regular print, large print, optical devices, or braille.
- **Examples of both near and distance information:** The assessment report should include examples of environmental features such as faces, signs, and travel cues the child can see and at what distance the child can see each feature.
- **Light sensitivity:** Light sensitivity has implications for how the student performs in a variety of illuminated settings. Children with diagnoses such as albinism or achromatopsia are significantly affected by higher levels of illumination and often perform tasks better under less illumination. There are also visual conditions for which additional lighting is necessary. For a majority of visual conditions, glare will adversely affect visual functioning.
- **Color perception:** Color perception is the ability to perceive differences in color. Because many facets of daily life are influenced by color (e.g., traffic lights, crayons, clothing), a child's ability to differentiate colors needs to be known.
- **Convergence:** Convergence is the necessary inward movement of the eyes in order to focus on a near object.

- **Eye movements:** Eye movements of children and youth refer to the ability to track a moving object in vertical, horizontal, oblique, and circular directions. Such eye movements are used when reading, copying work from the whiteboard, playing sports, and driving.
- **Eye preference:** Eye preference is a term used to describe the eye a person prefers to use for accessing his/her visual environment. Although not always, the preferred eye is often the eye with the better acuity.
- **Muscle balance:** Muscle balance is a term used to describe the alignment of the eyes and how they move together. Proper alignment is needed for the eyes to work together. In addition, proper muscle balance is essential for the ability to converge.
- **Binocular vision:** Binocular vision is a person's ability to perceive three-dimensional depth by fusing the images of each eye.
- **Depth perception:** Depth perception is the ability to distinguish an object's solidity and its position in space relative to other objects not in the same plane.
- **Visual efficiency:** Visual efficiency refers to how well a child completes tasks that require a visual skill.
- **Educational implications:** Educational implications are generally statements that address how a child's visual impairment will affect the child's functioning in a school setting.
- **Recommendations:** Recommendations are typically statements that reflect suggestions from the teacher for students with visual impairments about programming and how to make successful adaptations and accommodations.

Learning Media Assessments

One of the first questions asked about a child's learning is what his/her primary reading medium will be. Teachers and parents may be uncertain as to whether a child should learn braille, rely on large print or use regular print for accessing reading material. The purpose of the learning media assessment is to determine the most effective medium for accessing instruction and teaching methods. A certified teacher of students with visual impairments completes this assessment. The learning media assessment covers both general learning media and literacy media. General learning media are instructional materials and instructional methods. Literacy media refers to reading and writing in print and braille.

Clinical Low Vision Evaluations

A **clinical low vision evaluation** assesses whether or not a child will benefit from optical devices such as monocular telescopes and/or magnifiers. An optometrist or ophthalmologist who specializes in low vision and the prescription of optical devices performs the **clinical low vision evaluation**. The evaluation centers on how the child uses his/her vision on a daily basis in both the school setting and at home. Measures for visual acuity, visual fields, and color vision are taken. In addition, the clinical low vision specialist will check for refractive errors and the potential for the student to benefit from optical devices. Often devices are prescribed to meet a specific request of the patient. For example, a patient may want to access prices on items in the grocery store; the doctor may then prescribe a pocket magnifier that can be conveniently placed in a purse or pocket. One of the most beneficial results of the low vision evaluation is the link made between medical and functional aspects of vision loss.

Ophthalmologic and Optometric Evaluations

Only doctors can perform **ophthalmologic and optometric evaluations**. A medical doctor (ophthalmologist) completes the ophthalmologic evaluation and a doctor of optometry (optometrist) completes the optometric evaluation. The main purposes of the ophthalmology exam are to diagnose eye conditions and examine the health of the eye, as well as to give a prognosis of the visual impairment. A typical ophthalmologic exam involves dilating the patient's eyes in order to view the interior of the eye. Acuity and visual field measurements are taken as well as a check for glaucoma. Use of functional vision is not emphasized. The majority of special education programs across the United States require an eye report from an ophthalmologist in order to initiate special education services for a child with a visual impairment. During optometric evaluations, the doctor verifies the need for refractive lenses and prescribes glasses to improve acuity loss to the greatest extent possible. An optometrist is unable to medically diagnose a visual impairment.

Academic (Standard) Testing

Academic testing is primarily the responsibility of the child's classroom teacher. Children with low vision, however, often require modifications or adaptations in order to complete standard testing in their schools. A teacher for students with visual impairments and a general education teacher should collaborate before administering any tests. Needed modifications may include extended time, enlarged copies, and use of manipulatives.

Functional Vision Assessment (FVA)

The functional vision assessment is a pivotal assessment for children who have low vision. It is an assessment of how a child uses the vision he or she has in everyday life, so it is usually not done with children who are totally blind or have light perception only. Since a child's visual condition and abilities can change over time, the functional vision assessment needs to be repeated periodically.

A functional vision assessment will investigate how your child uses his vision for

- near tasks, closer than 16 inches
- intermediate tasks, 16 inches to 3 feet
- distance tasks, more than 3 feet away

This assessment is conducted by the teacher of students with visual impairments or sometimes an orientation and mobility specialist, who uses a combination of formal tests and informal measures, which may differ depending on your child's age. He or she will review your child's records, spend time observing your child as he goes through his day, and may interview you, your child, and the regular classroom teacher. Formal tests will include tests to assess

- visual acuity, or how clear and sharp your child's vision is. It is likely that both your child's near and distance visual acuity will be measured.
- visual field, or the area your child sees to the sides, above, and below (known as the peripheral area of vision)
- contrast sensitivity, or the ability of your child to detect differences in grayness and between objects and their background—that is, how clearly your child can see the elements of an image
- color vision, or the ability to detect different colors and also hues within a color

- light sensitivity, or resonse to light (sunlight or artificial light), which can be extreme for some children with eye conditions such as aniridia and albinism

Informal measures might include observing your child to see what eye he prefers to use when looking at materials or if he can locate an object in a picture that has a lot of detail.

Based on the information gathered through these various activities, the teacher of students with visual impairments can make recommendations about ways to help your child learn to use his vision more effectively. The recommendations may include

- modifications, or changes to the environment, such as providing additional lighting for certain tasks or seating your child with the glare from the window behind him
- areas of specialized instruction for your child, such as learning to use a magnifier to read print
- adaptations or materials that may assist your child, such as the use of a black marker to increase the contrast between the letters and the paper being used when he writes, or additional time for completing a test
- instructional strategies, such as teaching your child to use his vision to scan all the paint choices at art time, instead of always picking the paint in the container on the right side of the easel because he sees best out of his right eye
- referrals to other professionals, such as an assistive technology specialist or an orientation and mobility instructor, for example if your child often doesn't see branches or other objects on his right side that could hurt him

OBJECTIVES

Students will be able to :

- Understand specific needs of children with LD (ADD & ADHD), Visual Impairment, Hearing Impairment, Mental Retardation and Orthopedic Handicaps.

- Create curriculum for developing attention, perception, motor ability for specific groups of children.
- Develop alternative curricula to develop language skills in those with sensory handicap.
- Design appropriate curricula to develop skills in reading, writing and arithmetic for specific disabling conditions.
-

DEFINITIONS

Introduction

Parents and all who serve this group of young children wish to see a Vision Assessment Service Model which is efficient and effective. The criteria for such a service would include the following:

- provide the most comprehensive and appropriate service for the child's needs;
- be simple and allow participation and local access for parents to the service;
- enable the passing on of useful information to those supporting the child's development and learning;
- facilitate exchange of information between the health, social work and educational services;
- avoid duplication of effort.

Efficient transfer of information is vital, but difficult to achieve. Routes of communication for each VI Service could be identified, or established to ensure this efficiency.

Agreement on and specification of which assessments/tests should be carried out by which personnel would help in the following ways:

- cut down on clinical time spent on assessments which could be done by others;
- provide baseline information to help clinicians decide which investigation or further testing should be done;
- avoid the frustration of parents having to answer the same questions repeatedly and repeated administration of the same assessments.

The following model or process, has been drawn up through consultation with ophthalmologists and teachers of children with

visual impairment. Each VI service or education authority, will need to 'customise' it to local needs through a process of discussion and negotiation with local parents and professionals.
Marianna Buultjens, August 1998
1 Primary Strategy of Process

1.1 Referral
Although methods of referral will vary from area to area and service to service, note should be taken of section 2 in Vision for the Future (1995) especially 2.2 Interagency identification and referral.
1.1.1 Local documents should incorporate information on useful contacts in other services.
Initial assessment
General background (from parents, Record of Needs, Assessment Centres, School Profiles, Ophthalmologists, Community Medicine, orthoptists, therapists, paediatricians, home visiting teachers, nursery staff).
Vision history (from parents and medical information which is often difficult to get, depending on where child lives and medical services responsible).
Communication history (method of communication and potential).
Current developmental level (information as for General Background, supplemented by own assessments).
Family background (information on extended family, any relevant medical history, ethnic and language background, issues such as non-accidental injury).
1.2.2 Gathering the above information, especially from parents, might be done by a simple questionnaire, eg, of questionnaire attached (4.2).
1.2.3 Examination of Threshold Vision - methods and materials (Importance of another pair of hands and eyes when assessing, also video camera).
Light perception (Vision for Doing Sections 9: Response to Light & 10; Responses to Reflected Light).
General Observations (Precision Vision Tests 19 & 20, Heidi and grating paddles).

Acuity (Lea - Gratings; Cardiff Cards; BUST/LH; Kay Cards).
Contrast Sensitivity (Precision Vision (PV) Contrast Sensitivity Tests; Heiding Heidi (PV); Vision for Doing Section 14).
Colour Vision (PV Quantitative Colour Vision test with large caps; home-made materials). Important to get information from paediatric neurologist if likelihood of colour vision being absent.
Dark adaptation (PV Cone adaptation test: Observation).
Visual Fields (Vision for Doing Sections 13a-c; structured and unstructured observation throughout the day at home or school; use of video to supplement this and to help note child's strategies such as eccentric viewing and head postures).
Visual Sphere (distance at which child pays attention to visual stimulation).
NB For all the above, an approximate estimate of the speed of accomplishing each task is important. Number of seconds taken could be recorded. Statistics could be acquired over time. An initial grading of 'normal' or 'slow' could be given.
2. Secondary Strategies
For infants and young children with MDVI 0 - 7 years. This section needs to be developed individually and collaboratively to include further information needed and examples of intervention and methodology. The paper by Professor Gordon Dutton (attached) on the assessment of the performance of children with brain damage in terms of time, place and person, is a useful guide (4.4).

2.2 Type of Visual Deficit

2.2.1 Eye/Optic nerve Damage.
2.2.2 Brain damage.
2.2.3 Light sensitivity, eg, cone dystrophy.
2.2.4 Oculomotor dysfunction/accommodation difficulties.

2.3 Additional Disabilities

2.3.1 Impaired Hearing.
2.3.2 Motor disability, eg, Cerebral Palsy.
2.3.3 Communication and language difficulties.
2.3.4 Epilepsy.
2.3.5 Specific types of cerebral visual dysfunction, eg, blindsight, inability to recognise faces, inability to see moving objects or still objects.
2.3.6 Social and communication disorders, eg, autism.

The attached case studies exemplify various approaches to assessment and intervention.

2.4 Application of outcome of Vision Assessment. (See 3).

3. Case Studies

3.1 Case Study One: Six month old girl

Background

Six month old girl who is MDVI. Cortical visual impairment and cerebral palsy and developmental delay. She is the youngest of three children, living in a rural area of Scotland. Her parents contacted RNIB to find out about services available for their daughter. They had been told that their daughter would not be eligible for services as in nursery provision until she reached aged 2 years.

The parents were extremely concerned that their daughter needed to be in a stimulating environment from an early age - they know that Early Intervention is vital - on all fronts. RNIB put them in touch with Westerlea Early Education Unit in Edinburgh, the Bobath Centre in Glasgow and the Royal Blind School Nursery who have an early education group on Fridays. The parents have decided on Westerlea - the mother bringing the child herself.

They have local services of a physio once a fortnight, a pre-school home visiting teacher weekly and some input from the local VI teaching service. The pre-school visiting teacher is looking for support, and the VI teacher's post has recently become vacant.

The parents have asked for assistance in assessing the vision of their daughter and gathering information about her functional and potential vision. The availability of the Prevision Vision materials could be most useful in this case, where there may be an opportunity to network with the local pre-school VI service and Westerlea. The parents being the key players. RNIB could facilitate this as the link.

prepared by Anne Taylor, Family Services Offices, RNIB

3.2 Case Study Two: Girl aged 17 months
(for the purpose of this study to be known as Tracy)

3.2.1 Referral

Tracy was referred at the age of 11 months by the local Community Medical Officer to the local Pre-school assessment team, (Prescat). The referral was within a few weeks passed to the Early Years

Learning Support Team. Medical report was included in the referral. The case was allocated to one of the teachers who initially had difficulty making contact, as the house appeared to be empty when she made pre-arranged visits. There was then a 7 week gap before the next successful visit, after which the referral was made to the visual impairment specialist. The first joint visit (LS and VI teachers) took place 4 weeks later.

3.2.2 Initial Assessment

(i) History/General Background

Tracy was born after an emergency section, due to foetal distress. She was hospitalised for the 1st 2 months of life due to respiratory problems. Before discharge an ultrasound showed mild dilation of ventricles in brain. Mum was told to "expect problems".

When Tracy was aged 10 months, her mother was anxious regarding her development. Referral from Community Medical Officer gave a diagnosis of microcephaly and spastic quadriplegia, and gave a description of Tracy's physical development and degree of spasticity. "In prone position she keeps her head up. When picked up by the armpits, her legs stiffen and scissor. Her arms go into spasm on and off, and hands fisted and held in prone position."

Tracy on medication 3 times daily for seizures. Seizures have now stopped, and she is much calmer generally.

Tracy was being seen by hospital based paediatrician on a 6 weekly basis at time of referral, (aged 11 months), but was not being visited by any community based therapists. Referral was also made at this time to Speech and Language Therapy Services for advice on feeding, as she could not eat anything other than milk and soup, choking on anything more solid. This service has now been commenced, and therapist is working on de-sensitising Tracy's mouth and facial area around it. There has already been a slight degree of success.

Tracy now receives home based physiotherapy on a twice weekly basis, the programme concentrating at present on head control.

(ii) Vision History

Tracy was referred to Ophthalmology at age of 4 months for intermittent squint. At time of referral to Prescat, she still had not

been seen and this was to be "chased up" by CMO. Appointment was given for 2 months later. (Tracy now aged 13 months).
She has now been seen by ophthalmology dept. on 2 occasions. On referral to this vision impairment specialist, a request was made to the department for information on Tracy's vision, - after her second appointment, which was imminent at that time. A report was sent immediately thereafter - by the orthoptist who saw her on that occasion.
On the first visit Tracy was seen by a consultant ophthalmologist. He found no evidence of any visual response. Examination showed "fairly normal" fundi control and no need for spectacles. On the second visit, Mother had felt Tracy was seeing more, but orthoptist was unconvinced. It was felt that any inconsistent minimal response to ceiling lights may be due to involuntary convergence. She did, however feel that at times Tracy seemed to fixate on her Mum's face. If results are still inconclusive in 3 months time, referral will be made to another hospital for electrodiagnostic tests.
(iii) Family background
Tracy is the first child of the parents. Father works away from home and Tracy is looked after by her Mother alone for most of the time. There is a very supportive extended family who live near. Maternal Grandfather is wheelchair bound.

3.2.3 Examination of Threshold Vision

(i) Initial Observation
Tracy moves her eyes around a lot. She seemed to occasionally focus on one's face when addressing her, but on moving aside her gaze stayed static. She will turn her head towards sound, but there was no appearance of focusing on any rattles or soft toys, no matter how brightly coloured or boldly contrasting in colour.
(ii) Light Perception
Material used: Vision for Doing, Section 9 Learner's Response to Light. Tracy responds consistently to sunlight, daylight, camera flash , room light being switched on/switched off. In daytime it was difficult to get the room dark enough to use a torch to full advantage, but she did occasionally fixate briefly on filtered torchlight. Mum reports that she will occasionally gaze at a table lamp at a distance of

just over a metre. A fibre optic curtain was left to be used in darkness. In daylight Tracy consistently gazed at it for a few seconds at a time. When the effect was enhanced by placing hologram foil behind the fibres, she gazed for more than 30 seconds.

Material used: Vision for Doing, Section 10 Response to Reflected Light. For this we (LS teacher and VI teacher) started with a Christmas decoration - a faceted?! ball. There was a definite stilling from Tracy and a gaze at the ball which lasted a few seconds before she moved. This was at positions 1-6. Secondly we used a board 8ins by 8ins covered with silver diffraction foil. Tracy immediately gazed at this, and attention times were much longer. This was in positions 1-9. This has been a consistent response. The same response has been obtained from a tin with a 4 inch diameter covered in pink foil, but the attention time is shorter. When tester wore a tinsel wig there was a very definite focusing, and a definite smile on each occasion the head was shaken to move the tinsel.

(iii) Acuity

It does not appear at this point that Tracy is likely to have measurable visual acuity, but a trial of "Gratings" would be helpful, if available.

(iv) Visual Fields

Unstructured observation. Tracy appeared to be showing a more consistent response when board was to the left of mid-line. She also appeared to be focusing more when objects were at eye level. These observations were made by staff present, Mum and educational psychologist.

Vision for Doing Section 13a Responses in Visual Field (Upper half).

Using the Christmas ball, there were occasional brief stillings of gaze, but this will be better assessed using video.

Section 13b Responses in Visual Field (Lower half). The response here appeared to be more consistent. Again, this will be studied using video. We will also continue to use other materials and settings.

At present the scoring for both halves would be "Aware".

(v) Visual Sphere
The distance at which Tracy is aware of light reflective material is around 30cm.

3.2.4 Secondary Strategies

(i) Type of Visual Deficit
There appears to be no damage to the eye or the optic nerve. The extent to which the brain is damaged, and in which area, is not yet known.
(ii) Additional Difficulties
Hearing has not yet been assessed, but there does not appear to be a hearing impairment.
(iii) Motor Disability Tracy has quadriplegia
She has frequent spasms in arms and legs. She does make some little movements when bells are attached to wrists, and smiles during this. She does not hold anything, but has just begun to move her fingers in a grasping movement when her hand is placed on crinkled soft foil.
(iv) Communication and Language Difficulties
Tracy vocalises a lot. Babbles are of repetitive sounds. She has just begun to make a "tutting" sound, which she will do in a conversation with her Mum.
(v) Epilepsy
Seizures continue to be controlled by medication.
(vi) It is not known if there is any type of cerebral visual dysfunction.

3.2.5 Applications of outcome of assessment to IEP

(i)FurtherAssessment Responses to sound
Sense of touch
Sense of smell
Sense of taste
Most of this will be carried out by LS teacher, whose visits will alternate with VI support teacher, with constant liaison and one set of notes.
(ii) Continuing assessment of vision
Using Vision for Doing Sections 11 and 12 assess Tracy's response to moving objects and eye or head movements
Using video recording, observe response in upper and lower visual

fields.
Continue, with parents, to observe and note responses to visual stimuli in various settings and with a wide variety of materials.
Observe any eye contact when face is held very close to Tracy's.
Seek more information after any further ophthalmological examinations.
(iii) Working With Parents
Mum particularly is keen to read any available information. Texts given to her so far - "Show Me What My Friends can See", "One Step at a Time". Keen to follow out suggestions.
Tape given to Mum of action songs to encourage body awareness.
Mum watched RNIB video, "The World in Our Hands 1" - "Our Baby is Blind".
Told about "The Little Room" Dad is making a version, as there is not one available in our area.
Mum daily coming up with ideas to stimulate Tracy.
(iv) Meanwhile
Introducing activities to raise level of awareness using suggestions from Vision for Doing and also "A Sensory Curriculum" by Flo Longhorn.
(v) Liaison with Speech and Language therapist; Physiotherapist; Paediatric OT; Health visitor; Case Psychologist.
prepared by Lorna Hall, VI Support Teacher.

3.3 Case Study Three: "Peter", One year 10 months

3.3.1 Referral

GP and health visitor. Peter has been in another area until age 1 year 8 months.

3.3.2 History

Congenital micropthalmy of right eye and anophthalmy of left. General developmental delay. No further information on vision or development available from previous health authority. Makes known what he does not want by crying. If frustrated, Peter bites his own arm and screws up his face. Smiles and laughs when happy. No speech or sign yet. May have a hearing loss but does respond to voice and recognises people and sounds. Current developmental level: delayed by several months. Child is not showing interest in

environment sufficient for exploration. No attempt to crawl or walk. Uses a baby-walker to get about at home. Bottom shuffles elsewhere. Self-help: beginning to use a spoon if it is loaded for him. Finger feeding. Spout cup. Wonderful sense of rhythm.
Family History: Mother's second marriage. First marriage produced 3 children, of whom 2 died of cystic fibrosis in infancy. Second marriage produced 3 children of whom Peter is the second. Current family on "At risk" register. Previous incidence of abuse. Mother very supportive and loving toward children. No known history of visual impairment in family before now. Home visits should not be undertaken alone. Arrange to meet parents in Centre because father can be very resistant to what he sees as interference.

3.3.3 Examination of Threshold Vision

Light perception. Enjoys playing with toys that light up and flash. Holds them, very close to his eyes, using his own hands. Enjoys watching reflected light and is attracted to shiny surfaces. Always moves towards the French window. Flicks his fingers in front of his eyes.
Acuity: Prevision Vision Gratings: preliminary trial, shows Peter interested in 0.5 cpm at 40 metres. Intention is to repeat and confirm this.
Contrast sensitivity: Precision Vision Hiding Heidi will be used. No information on colour vision. The paediatric neurologist will be consulted.
Dark adaptation: observation only. Peter is able to distinguish objects in dim light, but is instantly happier when the light is switched on.
Visual field: very limited. Peter's eye is turned towards the inner corner. In order to obtain a better view, he often pokes his finger into his eye to manually change the position of the eyeball

3.3.4 Secondary Strategies

(i) Type of visual deficit
Absence of left eye. Very small right eye.
There has not been a neurological examination.
Light sensitivity is not apparent.

(ii) Additional Disabilities
Impaired hearing mainly due to repeated glue ear infections.
Grommets are to be fitted.
No apparent motor disability.
Delayed language. Understands simple one-word utterances. Is beginning to babble himself and has a vocabulary of about 6 words, eg, hello, ta-ta.
No epilepsy.
No apparent specific visual dysfunction.
Good relationships with carers and family.

3.3.5 Other services involved

Physiotherapist, occupational therapist, Assessment Centre staff, education psychologist (soon), GP, ophthalmologist.

3.3.6 Application of above information

Further assessment of vision: Gratings, Hiding Heidi, faces. Stimulation of current vision by use of lights, shiny play objects, eg, tin covered with reflective paper (Good for banging, rolling, opening to discover shiny and noisy contents, putting in and out, closing, banging, etc).
Use of this vision in making cup, plate, etc, visible for Peter. Use of sound and vision to encourage standing and walking.
Programme of environmental awareness raising; variety of textures, sounds, involvement of Peter in everyday activities like opening and shutting doors, picking things up, answering the telephone, etc.
Co-operation with the OT and physiotherapist to stimulate overall development.
Co-operation with speech and language therapists to use sensory stimulation to encourage language. Use his sense of rhythm to help with speech and general learning. Peter loves music, which can then be used as a vehicle for further learning.
Alison Duthie, Visiting Teacher for VI

3.4 Case Study Four: "Sally", Four years and 6 months

3.4.1 Referral

Sally is four years and six months old. She has attended the nursery unit of a school for children with complex learning difficulties for two years on a part time basis. She was referred by the head teacher of her school.

3.4.2 History

Sally was seen by Dr D two years ago. Sally's Mum reports that he said that her eyes were normal and the problem was with the brain processing the information. He believed that Sally could see light but "time would tell" as to whether Sally would develop her vision further. I have not had access to this report but hopefully I will in the near future. Sally has profound learning difficulties, cerebral palsy (spastic quadriplegia) and epilepsy.

3.4.3 Examination of Threshold of Vision

I used "Vision for Doing" to assess Sally's vision. I began by looking at the other senses and found that Sally's level of response was mainly at an awareness level and sometimes at an attention level. It was difficult to know exactly what constituted a response, for school staff as well as for me, as Sally has very limited gross movements and makes very frequent and apparently random fine movements of her head, arms, mouth and especially eyes. Consequently I decided to use the following method suggested by "Vision for Doing".

First I took a sample of Sally's exact movements every 10 seconds for between two and five minutes with no sensory stimuli present. Secondly I repeated the exercise with a visual stimuli present. I could then compare Sally's behaviour and conclude that any significant change in her behaviour when a visual stimulus present must mean she could see it. No difference would mean that she could not. Using this method I could that Sally's slight head, mouth, arm movements and most noticeably eye movements, were significantly less when a torch was shining, particularly with a red filter. This was also the case with torchlight shining on reflective material, and torchlight shining on fluorescent yellow and pink material (2 graphs showing samples of Sally's movements attached). I found no significant difference to her behaviour with or without visual stimuli presented in normal lighting conditions. However I did not have the opportunity to observe Sally's response to bright sunlight.

These are the recommendations that I made:

(i) Sally needs a sensory curriculum in which her responses to sound, smell, touch, taste and possibly a very small amount of residual vision can be developed. I would suggest a 'sensory bank' of sensory stimuli could be set up along the school lines discussed by Flo Longhorn in her book 'A Sensory Curriculum for Very Special People'. The 'Vision for Doing' manual also has some very useful ideas about how to move Sally from one level of response to the next.

(ii) Sally's responses in a dark room or multi-sensory room need to be closely observed. Sally makes almost constant very small movements of her head, arms, mouth or eyes. Staff need to look out for a 'stilling' response to visual stimuli, and for eye movements to decrease. Sally is not able to fixate on visual stimuli but may be keeping her eyes still in order to take in the information.

(iii) Similarly Sally's responses to sunlight need to be closely observed. Does she shut her eyes or put her head down or turn towards it? Sally responded to coloured filters with torchlight and staff could try a range of coloured filters outside on a sunny day.

(iv) The RNIB booklet and video 'Movement, Gesture and Sign' would be relevant for staff to look at. Sally would benefit from the 'Movement' section ideas.

(v) I would recommend a 'Little Room' along the lines suggested by L Nielsen to encourage Sally to begin to reach out and explore her world, starting with a small confined environment.

(vii) Aromatherapy massage would increase Sally's awareness of touch. Massage or gentle stroking with a variety of textures would also increase Sally's awareness of her body.

(vii) Sally showed some response to very bright fluorescent objects highlighted by torchlight and if possible I would like to observe Sally's response to fluorescent materials under ultra-violet light.

Louise France, Visiting Teacher for VI

3.5 Case Study Five: 'Gordon', Five years

Gordon aged 5 years at a special school for multi-disabled children aged 5-18.

3.5.1 Referral

The Headteacher of the school referred to the Visual Impairment Service for assessment because Gordon has a visual impairment and the TVI made regular visits to the school to work with the children. Gordon had recently joined the school from his local Nursery.

History: (Source School)
Microcephalic. Quadriplegic. Total care required in all areas. Appropriate postural support required at all times with regular change of position and use of aids to prevent/reduce swelling of his feet. Gordon's health has improved considerably since he had an operation to correct gastric reflux. He eats well and is generally alert and happy. His attendance is good. Gordon is regularly seen by a Physiotherapist who advises the school on aids, programmes and problems. He does daily exercises and he especially relaxes in the hydrotherapy pool where he is able to move his arms and legs. His positions include the side lying board with vibrator, standing frame, long legged sitting chair, multi wedge and James Leckey chair.
Record
A Record of Need was opened for Gordon before he started school.
Eye condition: (Source School and Ophthalmologist)
Cortical Visual Impairment and Myopia.
Communication: (Source School)
Gordon expresses his happy or sad feeling and needs by eye, facial, body movements and some vocalisation. He enjoys a music and movement programme each morning and he can show pleasure and some anticipation.
Family Background: (Source School and Parents)
Gordon lives at home with Mum and Dad and two older siblings. His grandparents play an important role in this close knit, loving and caring family.

3.5.2 Initial Assessment

Gordon was assessed within the school in general and particularly in the black and white stimulation area and the multi sensory room. Assessment was carried out on an individual basis and also in small groups. Ideas for assessment were taken from Vision for Doing and books by L Nielsen and F Longhorn. Assessment tools were basically the resources of the school and the only vision test that I had available, Keeler Preferential Looking. Unfortunately I had no access to Lea Hyvärinen's assessment materials.

3.5.3 Examination of Threshold Vision

Acuity. No specific details are known at this stage but acuity appeared to be 6/24 binocular without correction, using the Keeler test.

Contrast sensitivity. Does alert to light and much pleasure shown when in the black and white stimulation area.

Colour vision. Unknown but much pleasure was consistently shown when red or green were the main colours in the multi sensory room.

Dark adaptation. No suitable materials for testing.

Visual fields. Responses made, to the right and to the left.

3.5.4 Functional Vision

I am undergoing this stage of the assessment at present but initial observations showed that Gordon responds with eye, facial and head movements to varying visual stimuli. Responses are very slow and very often it is difficult to tell if he is focusing. Vocalisations are very limited and are generally made when he does not like something eg certain tastes from the sensory curriculum lessons. I hope to be able to assess Gordon more fully if I am able to have access to Lea Hyvärinen's materials.

Christine Stones, Visiting Teacher for VI

SUMMARY

- The disabled children of different categories have specific needs.
- Creation of curriculum for developing attention perception, motor ability for specific group of children.

- Development of attente curricula for development of language skills in those with sensory handicap.
- Designing appropriate curricula for developing reading, writing and arithmetic skills for specific disabled children.

CHECK YOUR PROGRESS

1. What is curriculum? How to create curriculum for developing attention, perception, motor ability for visual impaired children?
2. What points would you take into consideration to develop alternate curriculum for the development of language skills in those with sensory handicap.
3. Design curricula for developing the following skills in disability condition of your choice:
   (g) Reading skills
   (h) Arithmetic skills
   (i) Writing skills

ASSIGNMENTS

- Plan a curriculum to develop skills in reading comprehension in 10 yrs. old child with LD (ADHD).
- Design a curriculum to develop pre-language skills in a 8 yrs. old child with pre-linguial deafness.
- You have started an early intervention clinic. Plan a curriculum for children with VI, CP, & MR to optimize their development.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop and Sarah Lyman Kravits. (1998) Keys to Success. How to Achieve your goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986) The child's Language and The Teacher – A Handbook.

3. Lyndon W Searfoss John E. Readence (1994) Helping Children Learn To Read. Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The Trainers of the Mentally Retarded Persons. Pub.: NIMH Sewnderabad.

5. Paul A Aiocoto Anne C Troutman (1990) Applied Behaviour Analysis For Teacher Merrill Pub. Co. ohio 43216.

BLOCK 4: EDUCATIONAL IMPLICATIONS OF VISUAL IMPAIRMENT

UNIT – 1: EFFECTS OF BLINDNESS--PRIMARY AND SECONDARY

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Vision Loss Can Impact All Areas of Development

Social development is affected as children are not able to pick up on non-verbal clues or if they are unable to make eye contact they may appear disinterested and can reduced sustained social interactions. Loss of vision impacts motor development as a child may not be motivated to move toward that which can't be seen or causes inhibition to move for fear of the unknown.

Exploration of the environment and materials is critical in cognitive development, therefore movement is important not only for motor development but for development of concepts. Language acquisition can also be affected by the loss of vision as active interaction with people and the environment is important in language development. Delays in the area of independence in activities of daily living are impacted as incidental learning through observation is not possible for those with significant visual impairments. This impact can be magnified when caregivers, in an effort to help or to rush through activities, complete tasks for the child which creates a learned helplessness in the child.

OBJECTIVES

Maslow's hierarchy of needs is a theory in psychology. It is often portrayed in the shape of a pyramid, with the largest and most fundamental levels of needs at the bottom, and the need for self-actualization at the top. Maslow's theory suggests that the most basic level of needs must be met before the individual will strongly desire the secondary or higher level needs. Moslow hierarchy can be used to solve problems presented by the loss of vision.

1. Personal/Physical: 11 Senses, cognitive IQ, Muscular/skeletal reflex. The physical attributes of what's going on; sensorimotor. These are requirements for human survival. If these requirements are not met, the human body cannot continue to function.
2. Safety: Real. Sensorimotoric. Things that are physical (ex. not able to cross street the same way as sighted). Perceived. Can come from anyone. Must attack emotional aspect. With their physical needs relatively satisfied, the person's safety needs take precedence and dominate behavior.
3. Love/Trust: Have to trust someone. Someone needs to motivate me.
4. Esteem: Love and trust self. Trust own decisions.
5. Cognitive. Now able to pay attention. Transfer knowledge.
6. Asthetics/Motivation: Moving toward a motivation. Teach kids to be motivated and take risks.
7. Self Actualized. They do it. An accepted standard.

DEFINITIONS

Language has generally been seen as playing a powerful role in the development of children born with severely impaired vision (Landau & Gleitman, 1985; Warren & Hatton, 2003). Pérez- Pereira (1994) and colleagues have maintained over the years that language provides a privileged tool for children with VI, who rely on it and benefit from it to a greater extent than children who are sighted. 9 Verbal reasoning and intelligence helps children to develop strategies to cope with the loss of a

sensory channel. So linguistic competence is an important factor not only in terms of knowledge acquisition where it clearly plays an important role but also that it helps mediate social outcomes in children with severely impaired vision. For children who are visually impaired language-based measures are commonly used to assess their general intellectual level, making it difficult to isolate the contribution of language irrespective of a child's general cognitive ability. With regards to the "regular language" skills of children who are visually impaired from birth, research generally shows that these are developed with relative ease. A number of studies have demonstrated some specific delays and irregularities in early vocabulary acquisition and production, syntactic knowledge and acquisition of semantic concepts in children with VI (Andersen, Dunlea, & Kekelis, 1984; Dunlea, 1989), but generally speaking the development and use of "regular language" is largely in line with that of sighted children (e.g. Landau & Gleitman, 1985). An interesting example concerns the use of color terms. Studies with school-aged children have found that blind children do understand that vision endows color information and that this information is associated with objects and scenes. They have learnt then that bananas are generally 'yellow 'and that the sky is 'blue' and show the same expectations or predictions of the use of such color terms in verbal prose along with understanding the subtleties which the color terms are associated. While "regular language" skills such as articulation of speech, use of grammar, vocabulary level and conceptual understanding of the vocabulary in question, may enable a person to converse fluently they are not sufficient for achieving a successful socio- 10
communicative interaction with another person. For this, one must also master pragmatic language skills, i.e. use language appropriately in a given context. Vision is implicated in language development in general, as visually-driven joint attention experiences in early childhood are seen as providing a framework within which language learning occurs (Tomasello & Farrar, 1986). For this reason visual input may be of particular importance in the development of pragmatic language skills which are a cardinal feature of social communication. The picture is somewhat unclear regarding language use for social and pragmatic purpose in children with VI. Research studies looking primarily at

preschool children with VI, have raised concerns that children with congenital VI tend to use stereotyped language, show impoverished use of gestures for communicative purposes and use questions, sometimes inappropriately and to a greater extent than typically developing sighted children. It has been suggested that pragmatic language of children with VI has features that are similar to those of children with pragmatic language impairment (PLI) (Mills, 1993). Although it has been argued that such features of pragmatic language use of children with VI may have an important function in promoting their cognition and social interaction by providing an adaptive strategy to gather information, analyze speech, reduce memory load and avoid isolation. We ourselves have found that there are some irregularities in language presentation of a group of 15 children that we studied with congenital VI age range 6-12 yrs (Tadic, Pring & Dale, 2008a). Our findings were based on a structured language assessment (The Clinical Evaluation of Language Fundamentals – 3 : CELF- 3; Semel, Wiig, & Secord, 2000). We also used parental ratings of language 11 and communicative behaviors using the Children's Communication Checklist (Bishop, 2003). The checklist targets both structural and pragmatic language behaviors observable in an everyday context, but also social interaction skills evident from everyday language use. The children in this study were matched with typically developing children with the same age, gender and verbal IQ scores. The findings suggested that there is a discrepancy in presentation of language ability in children with VI; that is, average to good and potentially superior regular structural language skills, but weaker use of language for conversational and social purpose. The pragmatic language difficulties in the VI group were observed in a substantial proportion of the children, these together with the checklist scores on social interaction and restricted and repetitive actions combined to suggest that many were of clinical concern and consistent with autistic spectrum disorder (discussed below). Memory Some early studies on memory performance found that children and adults who were blind did not forget their experiences in quite the same way as their sighted counterparts. They retained the details of the sensory or narrative experience. (e.g. Pring, 1995). By contrast the process of learning in sighted people reveal a tendency to forget the exact material, the learning episode itself, but instead remember the gist or the overall meaning of the material. Several studies have reported significant advantages for short-term memory (STM) in children born with severely impaired vision, compared to sighted peers (e.g. Hull & 12 Mason, 1995; Smits & Mommers, 1976). Indeed advantages in STM have been noted in a wide variety of domains from pitch memory, sentence recall, auditory recall and memory for Braille and tactile illustrations (see Pring, 2008). Thus, the reliance and attention to auditory/verbal material and associations may be linked with maintaining information for longer in an 'active store', such as, for example, a phonological short term memory before dispensing with the information as it might be for sighted individuals. This may relate to the suggestion that individuals without sight have a higher incidence of absolute pitch ability than is normally found in the population. Spatial representation and concepts Vision is extremely helpful in understanding space, spatial relationships, internal spatial representations and spatial imagery - but studies have shown that it is generally not essential. For example while some children with VI opt to code their world sequentially, for example in terms of a 'route' (i.e. the path used for walking) others seem able to code for Euclidian space. Although not common, pointing is utilized by young blind children and when asked to point to an upstairs bedroom one child with congenital blindness could point appropriately to the room above and behind the child's location (Lewis et al, 2000a, in Lewis, 2002) while others were reported as more commonly pointing to the route they would walk to that room (Bigelow, 1996). The physical coding of movements in space; ie kinesthetic representation, seems to develop as efficiently in blind as in sighted children (Millar and Ittyerah, 1991). The role of anatomically and externally anchored reference systems in blind and sighted people is currently being investigated by Roder , Focker, Hötting & Spence (2008). Spatial localization of tactile stimuli appears to be influenced by their 'familiar' location , with respect to the visual field, thus, when the hands are placed in an unfamiliar posture (crossed over the midline) mistakes are made in localising tactile stimuli presented to the hands (due to the mismatch between tactile and visual familiar co-location). Roder, 13 Rossler & Spence (2004) have uncovered evidence that early visual experience may play a key role in establishing this influence of the visual spatial frame of reference on tactile space. They found that whereas sighted subjects showed poorer accuracy at locating tactile stimuli with crossed hands, the congenitally blind subjects demonstrated no such impairment. Furthermore, the late blind subjects (one of whom had been blind for 40 years) showed a similar crossed-hands impairment to the sighted subjects, suggesting that early visual experience is necessary in the typical development of tactual space perception. The imagery abilities of children with VI can be underrated. There is a developmental delay perhaps in being able to mentally rotate objects (Landau, 1991) but certainly by adulthood this ability can be achieved in an elaborate and creative way comparable to sighted controls (Eardley & Pring, 2007). Blind children can understand tactile drawings (Pring & Rusted,1980) and draw with raised-line drawing materials. John Kennedy's research has indicated the depth, sophistication and metaphorical artistry that can be found if adults and children with VI are given the tools to express themselves not only with sculpture but also in two-dimensional raised-line drawings (e.g. Kennedy, 2007). Research has shown that in many situations involving mental spatial imagery such as when dealing with pictures or maps a featural analysis is emphasized at the expense of the overall global impression (eg Ungar et al, 1995,1996). Raised outline maps were given to children to learn and the sighted children tended to use the spatial relationships between different landmarks and their relationship to the edges of the map to reproduce routes. Whilst the children who were blind did not perform as well, they had focused their attention on tracing the routes and naming the landmarks. The featural strategy is often less efficient, but research has shown that when required children and adults who are blind are able to use such methods. Indeed, recent research by Vecchi and colleagues 14 (eg. 2006) has shown that individuals with blindness can integrate very complex spatial mental images presented sequentially into a single integrated mental representation. This work too dovetails with the findings of Röder and colleagues mentioned above in relation to brain organisation changes in the visually impaired. Motor development Vision is implicated in balance, posture, gross and fine motor functions and although there is large individual variation significant motor delays have been reported. Hatton et al. (1997) looked at motor delays in 113 children aged between 12 and 73 months with a range of visual impairments but no additional disabilities. On the motor scale of the Battelle Developmental Inventory it was clear that the children with severe and profound visual impairment were very delayed in development, at 30 months of age their score was equivalent to 18 months, for example.. However, sight made a significant impact since the children with some form perception, at the same chronological age scored at the level of 22 months and this trend continued with the availability of more sight. Generally, the suggestion is that achievements that require self-initiated mobility are most significantly delayed such as elevating on arms in prone position, raising to a sitting position, pulling to a stand and walking alone. Vision seems to afford the impetus to cue a change in behavior and especially reaching out and grasping. Sound-initiated interest and the role of sound-making play objects in establishing the attention to and interest in objects to be grasped for the blind child are important. However research continues to find that there is some delay in both gross and fine motor development. In a study of 40 children with severe visual impairment, Levtzion-Korach et al. (2000) found that in all 10 15 aspects of motor development studied the children were slower than the sighted controls and the measurements predicted by the Bayley Developmental Scale (1993). For instance, they found that the children were delayed in standing alone with support (14.4 months compared to sighted children on average at 8.1 months). Not surprisingly climbing stairs with help (28.8 and 16.1 months) and standing on one foot (52.4 and 22.7 months) were amongst the greatest discrepancies reported. Methodologically it is a challenge to gain insight into the meaning of motor-movements or the absence of movements in the young blind infant and child. For example, Lewis (2002) in her book on disability points out that the baby may turn her head, not to locate the sound, but in order to equalize the time at which the sound reaches both her ears. Another example would be the 'freezing' movement which is also a very common behavior in VI and initiated in response to a noise or some interesting stimulus, reflecting an increased attentional focus on sound-based information by a child with VI (even though there may be no head movement).

SUMMARY

Children who have VIs often perform remarkably well in secondary schooling level after initial delays in primary school. One cause of such a delay is the difficulty inherent in mastering Braille. Reading Braille by touch with its 2X3 matrix of raised dots is hard because of the demands on tactual acuity. Each Braille cell (character in Braile) represents a letter and reading speed is increased by the 'contraction; of key Braille words, for example, there are individual characters to represent the word 'and' and the group of letters 'ing'. Braille teaching and perception is primarily 'sound-based' and beginning Braille readers often make 'mirror image' reversal errors and other similar confusions of global shape similar to those seen in developmental dyslexia. Children with VI and dyslexia have rarely been studied (though see Arter, 1998). In reading Braille the salient information is taken in while scanning the line (in contrast to vision and print), so it is important to watch the deployment of the hands and the precise timing of the fingers over small details as well as larger amounts of text as Susanna Millar has done (Millar, 1997). Children with VI can vary as to whether they use predominantly the left or right hand; they often use both hands together - the right hand first, followed along the Braille line by their left hand which has a place-marking and confirmatory role. In connection with lexicality, tactile letter identification and the verbally motivated role of readingas a rule of thumb it is probably correct to say that there is a right hand – left hemisphere advantage in adults (for example, Sadato et al, 1995), though, as Millar (ibid) points out, 17 it is foolhardy to attend to hand preferences in Braille reading when left hand advantage has been found for letter naming, where the spatial and pattern recognition aspects of the task are emphasized (Hermelin & O.Connor 1971; Rudel et al, 1977) and no hand advantage has been found for a variety of other reading related tasks (Millar, 1984). Behavioral profile Social emotional functioning Social understanding In recent years, there has been a particular emphasis on the deleterious effects of visual impairment on the social communication and social understanding of children with severe or profound visual impairments. The increasing prominence of this potential vulnerability is caused partially because it affects many

other aspects of cognition and impact on behavior. Certainly a number of researchers and clinicians have noted striking behavioral resemblances between children with congenital VI and children with autism spectrum disorders (ASD) for whom the use of visually-based information has been called into question (see Pring, 2005 for a general overview). Some preschool children who are blind can display a range of 'autistic-like' clinical features, including poor sociability and communicative competence, repetitive and restricted patterns of play, unusual sensory preoccupations, unusual mannerisms, stereotypes of behavior patterning and echolalia. 18 The mechanisms underlying specific social difficulties and the autistic-like presentation shown by some children with VI, as well as the mechanism by which many children with VI are able to overcome such developmental challenges, still remain poorly understood. Early social functioning and later social understanding in children with typical development and children with autistic spectrum disorder is outlined briefly below in order that the behavior of children with VI can be put into context. Early social functioning in typical development Infants benefit from varied and stimulating social lives from the earliest stages of their development. Early social experiences are dyadic in nature, with an infant taking part largely in face-to-face interactions only with one social partner at a time. Typically developing sighted infants demonstrate responsive conscious appreciation of the adult's communicative intentions and signaling by engaging in mutual eye-gaze, vocalization and rhythmic turn-taking patterns of behaviors (e.g., such as in social games like 'peek-aboo'). From around six months of age the new patterns of communication emerge, as the child moves from the purely dyadic interactions with one social partner into the world of objects. The main characteristic of these novel experiences is the infant's awareness that their experiences of objects, people and events can be shared with others. The coordinated sharing of attention (known as joint attention) between the child, an adult and objects in space has been the subject of much research. Its behavioral manifestation encompasses a complex set of actions, such as eye-gaze directing and 19 following, point following, showing and pointing, the purpose of which is to negotiate and share the mutual focus of interest with a social partner. Research evidence (Tomasello & Farrar, 1986) suggests that such behaviors emerge typically between six and twelve months and consolidate by eighteen months of age. These shared experiences between infants and their caregivers are largely driven by visual modality, hence they are often referred to as 'joint visual attention'. Later on these young children begin to show more complex aspects of social understanding. By between 18 and 24 months of age a child may engage in pretend play. Pretend play involves the child understanding that one object can stand for another, that pretend properties can be attributed to real objects and that pretend interaction can be carried out with a non-real object. Certain ways of thinking then, that follow on from joint attention and precede theory of mind, (discussed below) underlie the child's ability to reason about hypothetical situations (e.g., pretending that a banana is a telephone). As the child develops and has more varied experiences of the world and people, s/he develops a critical milestone of social understanding – Theory of Mind. 'Theory of mind', 'mind reading' and 'understanding of others' minds' have been used synonymously in psychology to refer to the child's ability to understand and attribute a range of mental states to self and others in order to explain and predict their actions and behaviors (Leslie, 1987). In other words, to make sense of the sophisticated social environment that surrounds them, children must be able to understand that other people have intentions, desires, thoughts, beliefs and feelings which are different from their own and that such states of mind will influence people to act and behave accordingly. Our 20 actions then can best be understood by a child if s/he can guess what is in our mind but can be baffling if s/he is unable to do this. Understanding that people's actions can be caused by their intentions is typically acquired by the age of five. Between the ages six and eight the child's awareness becomes more sophisticated not just in terms of appreciating that people have beliefs about the world (which may be different from the child's own beliefs), but also a growing sensibility/realization that they have beliefs about the content of others' minds (i.e., about others' beliefs), and similarly, that these too may be different or false. Over the later school years more complex and sophisticated use of theory on mind abilities are developed including, for example, the use of irony (Happé, 1994). Development in social understanding in VI Research has shown that children with VI can develop free from any cognitive, social or behavioral difficulties, and where difficulties do exist, these may be overcome, being viewed simply in terms of a delay. Nevertheless, it has been reported that some children with blindness continue to experience problems, in particular in the areas of social interaction and communicative competence; emotional expressiveness and emotional recognition; symbolic and functional (i.e., pretend) play; behavioral mannerisms, rituals and stereotypies; repetitive and unusual patterns of language use (i.e., echolalia and pronoun reversal) and autistic-like developmental regression (Cass, Sonksen & McConachie, 1994). 21 In typically developing sighted children joint attention ability is believed to develop spontaneously, evolving out of a natural context of routine child-caregiver interactions; the caregiver's sensitivity and responsiveness to the child are the key ingredients to the child's developing interpersonal engagement. Vision is likely to facilitate the caregiver's involvement, the manifestation of which is likely to be different for children whose attention cannot be directed through eye-contact and visual gestures. However, Preisler (1991) while watching very young children with VI, noted that the children's interactions at first seemed to be developing well, but from around their first birthday3 they had a notable difficulty with establishing the ability to engage in joint attention. Although they could share themselves with their mother, aided by the mother's affect attunement, the children were unable to co-ordinate their attention at the same time towards an object in the external world. The triangulation then between the two actors and the object was not apparent. Interestingly, Preisler also noted that the infants with VI were attentive to the sounds in the environment and reacted to those sounds by establishing frozen bodily and facial postures. However, while these subtle signs, in addition to distinctive body pointing towards the sound, may provide the means of 'attention directing' from the visually impaired child's perspective, such behaviors may be too subtle and ambiguous for the parents to interpret or notice. Rogers and Puchalski (1984) commented that where the child is visually impaired, both partners in the child-mother interaction are disadvantaged. While the child is deprived of visual information and the lack of effective communication by the mother, who cannot interpret the child's signals, the mother is deprived of positive and responsive cues from 22 her child that would let her know that she is doing the right thing. The study by Rogers and Puchalski highlighted the poverty of responsive social exchanges and initiations in mother-child dyads in cases of children who are visually impaired in contrast to the interactions of sighted children and their mothers. Presumably, this 'vicious circle' of impoverished parent-child responsiveness is likely to be both a cause and a result of impoverished joint attention capacity in children with VI. However, in a study of two infants with congenital profound VI, Urwin (1978) showed that the nature of caregiver-child responsiveness is largely adaptive; once the mother has discovered particular cues that elicit the response of their child with VI, they were able to use these cues repeatedly: "[They] used phased touching routines to alert the babies' attention; they would trace their fingers around the babies' mouths, blow on their faces, and encourage them to explore their own body parts. [They] would mock-imitate the babies' fusses, coughs, splutters and sneezes to 'dramatize' the babies' actions" (Urwin, 1978, p. 88). However, despite the effective socio-interactive routines that facilitated the dyadic relationships between the children with VI and their mothers, both infants studied by Urwin showed difficulties and delays in their triadic interactions that require children to incorporate objects into their interactions with adults and establish reversible exchanges of actions on objects. Neither child exhibited spontaneous 'showing' behaviors to initiate joint interaction with the mother; if any reverse actions of 'giving and taking' emerged, they were largely a result of specific training provided by the mother. 23 It must not be forgotten that the effects of vision are extremely powerful and as Bigelow (2003) argues, some behaviors will serve a different function in children with VI compared to sighted children. This serves to exemplify the challenges of research in this field. Children with severely impaired or absent functional vision depend developmentally on tactile information and memory, as well as auditory input such as sound changes, air currents, echolocation (Millar, 1988) and verbal guidance by others. Such experiences must at least to an extent allow them to learn to co-ordinate the spatial placement of objects and establish a shared focus on such objects with others. However, despite the evidence of some joint attentional engagement in children with VI, it generally appears that the nature of such engagement is qualitatively different from what is known about joint attention capacity of sighted children, and this is particularly evident at the level of joint attention. In terms of play in young children with VI there have been mixed reports. Fraiberg (1971) was perhaps the first one of many who mention the lack of "pretend" or symbolic play as opposed to functional play among blind children. Symbolic play involves the substitution of one object for another, for example when a cardboard box becomes a 'car' or a wooden spoon takes on the features of a 'baby'. According to the results of a parental survey by Tröster and Brambring (1994) blind children and sighted children who engaged in 'undifferentiated manipulation' of objects were aged 16 and 8 months respectively, those relating to objects were 26 and 13 months respectively, those manipulating objects appropriately were 40 and 24 months respectively and those playing 24 symbolically were 55 and 35 months respectively. While Hughes et al. (1998) demonstrated in a study of young pre-schoolers that children with profound visual impairments (n=6) spent significant amounts of time in indiscriminate mouthing and manipulating of the toys (up to 75% of their time), while children with only severe sight loss (n=7) but some form vision far less so (44% of their time). It is clear from the above that some children who were blind demonstrated extremely delayed play behaviors though some contrasting results from Pérez-Pereira and Castro's (1992) report that twin 3 year-old girls, one of whom was blind, frequently engaged in imaginative play, and Chen's (1996) observation of symbolic play between blind children aged 20-30 months and their parents. Lewis et al (2000b) studied 18 children with VI and found some impairment in functional and symbolic play, but when they removed from the sample the 4 children who met the diagnostic criteria for autism then a different picture emerged, one where symbolic play was at a comparable level to children with sight. Bishop, Hobson & Lee (2005) also removed children who met a diagnosis of autism from their study of play in a group of congenitally blind children . They found that while some, socially able children were able to use symbolic play and were very similar to sighted children, the less socially able group showed significant poverty of symbolic play when compared to a matched mental age and IQ sighted group. Children with VI are restricted by their vision-loss and are likely to be vulnerable to developmental delay as a result but we have still a long way to go to see why some children with the same degree of blindness seem to be influenced by, what we could call, protective factors. Emotion 25 Children who have profound visual impairments do have an understanding of causeeffect relationships that evoke basic emotions (i.e., happiness, sadness, fear and anger). More specifically, they are as able as sighted children to identify such emotions as they occur typically in specific situations, from their own perspective (e.g., How do you feel when you receive a new gift?) (Roch-Levecq, 2006) and from the perspective of others (e.g., Susan is given a new bicycle for her birthday? What will Susan feel?) (Dyck, Farrugia, Shochet, & Holmes-Brown, 2004). Moreover, Dyck et al. (2004) reported that, when asked explicitly to explain the meaning of emotions (e.g., What does the word 'angry' mean?), the semantic knowledge of children with VI even exceeded the knowledge of the sighted controls. However, both studies found that in the task which required children to represent mental states more implicitly the children with VI were not as proficient. Whilst being able to explain the meaning of basic emotions, the children with VI studied by Dyck et al. (2004) were less able than their sighted peers at recognizing vocal intonations specific to different categories of emotion. A similar difficulty among children with congenital VI with recognizing vocally expressed emotions has been reported by others; this was in comparison to recognizing environmental sounds in school-aged children (Minter, Hobson, & Pring, 1991). Research suggest that the facial expressions of children and adults with VI are less florid than sighted counterparts. When asked to voluntary mimic emotional expressions on their faces Galati and colleagues (Galati, Miceli, & Sini, 2001) found that the same groups of muscles were activated to imply expression, but in a less marked way than sighted children. Their research showed that both spontaneous and voluntary expressions were 26 more ambiguous to sighted observers, probably because they lack experienced-based support and feedback. Gallese (2003) has suggested that perceived actions in others are internally simulated or replayed automatically via motor, cognitive and emotional representations. A number of brain systems may be involved in such a process but a candidate neural network is the mirror neuron system. It is interesting to speculate on the importance of the mirror neuron system and internal simulations in development and indeed to consider what the impact of an impairment to such a system might mean, for example in autism (Oberman & Ramachandran (2007), or indeed, in the case of blindness. Autism and Autism spectrum disorder Theoretical and empirical advances in the understanding of the development of social milestones such as joint attention and theory of mind in the past twenty years have gained additional momentum largely as a consequence of the clinical emergence of the concept of autism spectrum disorders (ASD). Autism is a pervasive neurodevelopmental disorder and although biologically based, with a clear genetic component, the disorder is defined and diagnosed on the basis of a triad of behavioral difficulties, namely in social interaction, verbal and non-verbal communication, and repetitive behaviors and restricted interests. The deficits in theory of mind understanding in autism have been related to disruptions in joint attention in early childhood and the lack of behaviors such as gaze and point following, showing and pointing (Charman, 2003). Absence of these behaviors in children with autism forms one of the criteria for diagnosing the disorder (DSM-IV-TR, 27 2000). Descriptively, such children generally seem socially aloof and distant – they do not experience the social world, they lack the behaviors of eye gaze detection or point following, they do not watch faces to help them understand meaning and intention. Thus, in many ways they appear as if they are unable to see the social world that surrounds them and within which different mental states and feelings arise. They have difficulty in adopting pretend play on their own or with playmates. They exhibit then a constellation of behaviors (to a greater or lesser extent) which place them apart from typically developing children. Theory of Mind Hobson (e.g. 1993) has been the most influential in recognizing and trying to explain the importance of vision for early development of relationships and social understanding. His experimental studies and that of others have indicated the serious difficulties confronting children with VI in developing Theory of Mind understanding (e.g. McAlpine and Moore, 1995). Peterson, Peterson, & Webb (2000) for example assessed two groups of children with differing levels of VI and across differing ages (averaging six, eight and twelve years). The findings of the study showed that, while the majority of the six year olds failed all four false belief tasks, the false belief performance improved with age, although significant difficulties could be seen in some eight year olds and to a lesser extent the twelve year olds. Certainly, many children with congenital VI lag behind and then catch up with their sighted counterparts- some need to take as longs as 6 or 8 years, and a subset of children with VI have longer-term difficulties. Such findings were most recently supported by Roch-Levecq (2006) who also demonstrated that primary school 28 aged children with congenital and profound vision loss who have normal intelligence have a significantly poorer false belief understanding than developmentally matched sighted controls. While the majority of the studies on theory of mind in children with VI assessed the early belief understanding, Pring, Dewart and Brockbank (1998) used the Strange Stories paradigm (designed by Happé, 1994) to assess their more advanced theory of mind understanding. The task consisted of presenting children with a number of stories about everyday situations where the story protagonists say things that they do not literally mean (i.e., tapping advanced mental state elements, such as sarcasm, misunderstanding, persuasion, pretence and deceit). Pring et al. found that the children with congenital VI were poorer than age-matched sighted controls in predicting whether the protagonist's statements were true and giving contextually-appropriate mental state justifications for these statements. This suggested that the previously observed socio-cognitive difficulties, based on the children's false belief performance, persist into later childhood in children with congenital VI (i.e., age 9-12). The authors also reported a significant relationship between the children's general intellectual levels and the frequency of their appropriate mental state justifications, suggesting that children with VI who are intellectually more able may also be more able to compensate for difficulties in social cognition than children with lower intellectual levels The issue of the link between autism and blindness is a thorny one. However, there is increasing evidence that congenitally blind children are 'at risk' of presenting with autism 29 or an autistic-like condition (ALC). It may be more parsimonious to refer to the condition as ALC because as yet we cannot say whether such children show the neurotypical profile consistent with autism. While co-morbidity is likely to be as prevalent as it is in the sighted population it is likely that vision-loss itself interferes very significantly with those aspects of development that are impaired in autism. Thus we see the triad of impairments in varying degrees in children with congenital profound or severe blindness. There is no doubt that IQ may be a protective factor, along with a predisposition to show strengths in social ability – the research work of Hobson and his group working within a strong theoretical framework are likely to continue to make a significant contribution to out understanding (e.g. Bishop, Hobson & Lee, 2005). At the same time the studies that provide overviews of groups of children with VI, broken down by diagnosis, severity of vision-loss as well as behavioral measures, also helps to elucidate the nature of the relationship (e.g. Mukaddes et al, 2007). In terms of diagnosis it is useful to know that the autistic-like clinical features in children with congenital VI were initially observed in small groups of children with specific diagnoses such as congenital Rubella, Leber's Amaurosis and retinopathy of prematurity. However, the prevalence found across different etiologies implies that such psychopathology in children with congenital VI is not confined to any specific ophthalmologic disease. Instead it is the severity of VI and brain damage, with its associated intellectual impairment that are seen as the most important mediating factors along with the recent report implicating cerebral palsy (see Mukaddes et a, 2007) 30 Summary There are multifactorial reasons for children without sight to present with similarities and differential aspects of cognition and behavior when compared to the typical child. At one end of the continuum we can see significant advances in brain research demanding new ways of thinking about neural plasticity and brain functioning and at the other end we see how children's social interaction is modulated by their experiences. There are some areas of research that are not mentioned here because they lead to many imponderable questions such as the impact of diagnosis on the infant –caregiver dyad. Additionally, there has been a conscious effort to focus primarily on developmental issues rather than sum up the all the literature concerned with the loss of vision itself. Methodological considerations are also critically important but exacting standards are hard to maintain in an area of research with such a rare population. The amount of sight is hard to assess and can change in the samples of populations that are often reported, and other factors and problems linked to the site of brain impairment has been discussed above, yet these are all important considerations. Finally, behaviors exhibited by children who are VI can be hard to understand for sighted parents and clinicians alike. The visual channel is so important in integrating the senses – those with sight accept it unthinkingly. So that some behaviors may be hard to understand on the basis of current knowledge, for example why finger movements and manipulation might be delayed in blind babies, whose fists are often balled in the early months. Other behaviors, especially in relation to the development of social understanding, may be more successfully understood by learning from the findings with typically developing children. Although language and other non- 31 visual channels of information can compensate for much, it seems that sight-based knowledge, founded on the massively varied array of visual stimuli (including people) in the natural and man-made world, has a surprisingly critical influence on growing up .The degree of blindness suffered by an infant has a significant impact on their behaviors, and yet there are also reports to the contrary, of behavior comparable to sighted counterparts. No doubt this is where the interactive nature of development, and the multiple factors that mediate changes, have an effect. The vulnerabilities have been outlined in this chapter but there are precious few reports of the protective factors which lead to the most positive outcomes – it is to this that intervention and research studies need to turn their attention.

CHECK YOUR PROGRESS

1. What is curriculum? How to create curriculum for developing attention, perception, motor ability for visual impaired children?
2. What points would you take into consideration to develop alternate curriculum for the development of language skills in those with sensory handicap.
3. Design curricula for developing the following skills in disability condition of your choice:
   (j) Reading skills
   (k) Arithmetic skills
   (l) Writing skills

ASSIGNMENTS

4. Plan a curriculum to develop skills in reading comprehension in 10 yrs. old child with LD (ADHD).
5. Design a curriculum to develop pre-language skills in a 8 yrs. old child with pre-linguial deafness.
6. You have started an early intervention clinic. Plan a curriculum for children with VI, CP, & MR to optimize their development.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop Keys to Success. How to Achieve your and Sarah Lyman Kravits. (1998) goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986)The child's Language and The Teacher – A Handbook.

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John E. Readence (1994) Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The Trainers of the Mentally Retarded Persons. Pub.: NIMH Sewnderabad.

5. Paul A Albeoto Applied Behaviour Analysis For Teacher
Anne C Troutman (1990) Merrill Pub. Co. ohio 43216.

UNIT – 2 : SELECTIVE EDUCATIONAL PLACEMENT

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

There is a general consensus the world over that employment is the most essential but the toughest aspect of rehabilitation. Employment of the visually impaired is a more potent problem in India due to: higher incidence of visual impairment; ı near non-existence of social security benefits; ı higher prevalence of visual impairment in the working age group; ı limited education and training facilities; majority of them are illiterate, confined to their homes, ı high rates of unemployment and rampant underemployment. Most visually impaired persons and their families come from the poorest rungs of society. In fact, studies have revealed a very high correlation between poverty and disability. The cost of maintaining such persons in the family adds to the financial burden. Thus their economic rehabilitation does not remain an individual need; many a times it becomes a question of survival of the family.

OBJECTIVES

1 It has been observed that a vicious cycle of the following components is an obstacle to the employment process: ı Absence of identification services ı Lack of job-oriented training facilities ı Irrelevant training ı Lack of training of employment officers ı Lack of an implementing machinery and absence of a system of delivery of services ı Ignorance of employers ı Apathy of employers and Government officials. To expedite the employment process, it is essential to: ı direct all efforts at breaking the vicious cycle at some stage; ı extend appropriate job-oriented training and career counselling facilities; ı prepare a person for suitable employment; ı convince the employers to extend him employment; ı counsel family members and community in this regard; and ı involve Government machinery actively in the process. 1.2 Explanation of the term "Employment" It is essential to expatiate the term 'employment' which has different connotations for different people. Employment per se does not mean formal, secured or regular employment only. It also means: ı any trade, economic activity or profession; ı in the organized as well as unorganized sector; ı any trade that would provide with some monetary remuneration. The term employment used by rehabilitation planners generally ignores a vital aspect that the community itself offers a wide spectrum of opportunities where visually impaired persons may be absorbed in gainful occupations. Rehabilitating a 50 year old lady in a remote village in India, for example, means helping her to take care of her household activities as she used to perform prior to her visual impairment or more importantly to perform the same tasks that the sighted women perform. Majority of women in rural areas are expected to perform the following activities: ı Cook meals for the family ı Perform household activities ı Take care of children and the elderly ı Fetch water ı Undertake rural occupations or the family trade Thus they enable the other family members to undertake income generating activities and in the process they contribute indirectly towards family earning. This is what is meant by gainful occupation and thus economic rehabilitation. Work is

essential for every human being, not only for the sake of money and for economic independence, but also because it contributes to self esteem and self dignity leading to an abiding joy for life. For persons with disabilities, it is still more important as the self esteem and financial gains generated out of it would offset to a great extent the negative impact of disdainful attitude of the society. (Pandey & Advani, 1995) 1.3 Explanation of the term "Economic Rehabilitation" Economic rehabilitation aims at developing and enhancing the functional abilities of a person with disabilities so that he/she is gainfully occupied resulting in economic contribution to self and the family. In fact, economic rehabilitation is the principal objective of the existing approach to CBR - a concept initiated and promoted by Rural Activities Committee of the National Association for the Blind all over the country. Economic rehabilitation includes any trade, economic activity or profession which enables an individual to make any tangible or intangible 298 299 contribution; any monetary or non-monetary service support to the family or community in the organized as well as unorganized sector. 1.4 Income Generation The income generation activities on the other hand are a subset of economic rehabilitation and these mean direct monetary or tangible gains derived on a regular basis for services rendered or goods provided. Vocational training should generally lead to promotion of income generation or many a times economic rehabilitation. In general parlance, vocational training aims at promoting open employment of the individual. It refers to skill development through a structured and formal training programme which aims at placement of a person in open competitive wage employment in the organized sector. 1.5 Vocational Rehabilitation Vocational rehabilitation is an outcome of the employment process. It may be achieved through open, self or sheltered employment, gainful occupation or income generation. ILO Recommendation No. 99, Paragraph 1 (a) reads: "For the purpose of this recommendation the term 'vocational rehabilitation' means that part of the continuous and coordinated process of rehabilitation which involves the provision of those vocational services e.g. vocational guidance, vocational training and selective placement, designed to enable a disabled person to secure and retain suitable employment" 2. Production Potentials A visually impaired person is generally considered: ı unproductive and lacking in production skills; and ı a burden on the society. Remaining idle and unemployed are probably the major causes for the resultant isolation, depression and rejection in him. It has been established that a visually impaired person can perform competitively in various professional, semi-professional and industrial jobs; rural crafts, trades and agricultural operations. It has been observed that when incentives for work motivation and recognition of high performance are available, his performance is comparable to that of a normal person provided that the job does not require visual discrimination or the same has been compensated for. 3. Avenues of Employment 3.1 Unorganized Sector 3.1.1 Self Employment 3.1.2 Professional Employment 3.1.3 Home-workers 3.1.4 Cooperatives 3.1.5 Community Based Rehabilitation 3.2 Organized Sector 3.2.1 Open Employment 3.2.2 Special Employment 3.2.2.1 Sheltered Workshops 3.2.2.2Transitory Employment Workshops 3.2.2.3 On-the-job Training Centres 3.1 Unorganized Sector In India, the employment opportunities for visually impaired persons in the organized sector, particularly in the rural areas are almost non-existent. This employment crisis, both for the visually impaired as well as the sighted, has resulted due to exclusive dependence on the organized sector which accounts for only a small proportion of the work-force. The unorganized sector which is the major avenue of employment for the sighted, 300 301 may prove to be the most appropriate avenue of employment for the visually impaired also, if suitably exploited through: ı a coordinated approach; ı need based training, and ı an effective system of delivery of services. 3.1.1 Self Employment a. Definition: The term self employment generally implies self initiated, developed and regulated income generating opportunities where the individual plays the role of the investor, employer and employee. ı Availability of bank loans, subsidy and financial incentives ı Training can be availed in the house or the village itself. c. Factors Responsible for Success ı Business acumen, foresight and knowledge of occupation ı Capacity and willingness to work ı Understanding environment and the individual needs ı Availability of training facilities ı Compatibility between training facilities and the specific requirements of the venture ı Level of support from the family and community ı Existence of an organizational net-work ı Availability of a launching grant ı Coverage of the occupation under the existing schemes ı Prevalence of occupation in the area ı Financial viability of the venture d. Illustration ı Physiotherapy and massage ı Computer programming and operation ı Marketing, salesmanship and trading ı Petty shop keeping, vending stall ı Music ı Courier services ı Insurance agency ı Touch typing, stenography ı Public call office-telephone operating ı Internet and E-mail b. Importance ı Vast employment potential ı Could be carried out with the active involvement of the family members who could play a complimentary role to each other ı Requires low investment resulting in speedy returns Self employment as a petty shop owner 302 303 ı Plastic moulding, motor rewinding, furniture repairing, chair caning ı Bicycle repairing and hiring out ı Travel agency 3.1.2 Professional Employment Definition: Professional employment refers to open employment or self placement of qualified and trained individuals in various professions a. Importance ı Ideal avenue for educated persons ı Higher social status ı Easy social acceptance ı Higher earning ı Appropriate use of skills ı Better chances for formal placement and selfemployment ı Easy career growth b. Factors Responsible for Success ı Initiative and hard work ı Good mobility, suitable orientation ı Acquiring of specific skills through higher education and appropriate training ı Availability of appropriate assistive devices, adaptations and techniques ı Involvement and coordination of research, industrial training and higher education institutes and universities in the process ı Support from the National Handicapped Finance and Development Corporation ı Recognition of courses by accredited agencies ı Governmental, administrative and institutional support. c. Illustrations ı teachers, music teachers, vocational instructors ı masseurs, physiotherapists Computer operator Operating Braille Embosser 304 305 ı stenographers, computer programmers, data entry personnel, internet and E-mail operators ı lawyers, solicitors ı business managers, marketing executives, management consultants, public relation officers ı interpreters, employment interviewers, social workers and psychologists 3.1.3 Home Workers : a. Definition: The Helen Keller International has defined industrial home work as "A service to be rendered by an accredited agency - designed and developed with the intention of adhering to health and labour laws - to offer regular work training and remunerative work opportunities to those eligible disabled persons who cannot for physical, psychological or geographical reasons leave their homes to travel to and from a place of business". b. Essential Features: According to the ILO publication "Employment of Disabled Persons - Manual on Selective Placement" some essential features of a good home workers programme are: ı adequate transport facilities for the supply of raw material and collection of finished products; ı availability of raw material; ı availability of training facilities; ı effective sales organization; ı sufficient supervisory staff to visit the stake holders at their homes; ı variety of suitable work to suit skills and aptitude of workers; ı support of family members and community. ı prevalence of occupation, production activity or craft in the area; ı adequate remuneration for the work. c. Some other features may be added ı Financial viability ı Professional approach ı Availing of following benefits: * bulk buying * low cost of investment * financial assistance for initial training * incentives, subsidy, low-interest rate loan from the Government ı Identification of occupation specially for the visually impaired ı Legislative support to the activity ı Institutional and administrative support to the activity. Caning of chairs 306 307 d. Importance: Home-work is the most important avenue of economic rehabilitation for the visually impaired who are home-bound due to: ı nature of their disability, ı age, ı lack of mobility, ı physical incapacity, ı social constraints, particularly in case of women. ı lack of education or specific production skills e. Limitations: In a module initiated and implemented at the Blind People's Association, Ahmedabad for the training and employment of persons with disabilities of all categories in domicilliary occupations as home workers, the following problems have been identified: ı Limited choice of products ı Scattered target group ı 83 percent visually impaired persons are above the age of 45, hence lack of motivation amongst them ı Non-availability of space at home for carrying out production activity ı Lack of uniformity of quality of finished products ı High cost of material distribution ı Lack of availability of any Government assistance and no coverage of such schemes under the Central Scheme of Assistance to Voluntary Organizations ı Pilferage of finished products ı Damage to products in transit 3.1.4 Cooperatives a. Definition: The ILO publication "Vocational Rehabilitation and Employment of the Disabled : A Glossary" defines cooperatives of the disabled as an association of the disabled which aims to promote their vocational and social rehabilitation by their gainful employment in a common enterprise run on co-operative self management lines within the frame-work of the national economic plan, and also to engage in social and educational activities for the purpose of: ı preserving and enhancing physical efficiency; ı restoring them to social activity; ı enabling them to earn a living; ı satisfying the social needs, and ı improving standards of living. b. Important Features ı Unity of ownership ı Forming a self controlled organization ı Voluntarily joining together to achieve a common end ı Similarity in production activities ı Proximity of work place ı Bulk buying and bulk selling ı Making equitable contribution to the capital required ı Accepting a fair share of risks and benefits ı Statutory recognition to the duly constituted cooperatives ı Availability of incentives, credit and other facilities. c. Limitations: In India, cooperatives of the sighted have generally succeeded in credit, consumers, housing, dairy, irrigation, agriculture and allied pursuits only. The cooperatives in the industrial sector have not performed satisfactorily. The cooperatives exclusively for the visually impaired have not performed well, probably, due to following limitations: 308 309 ı Scattered target group ı Limited choice of products ı Diversity in backgrounds of the target group ı Lack of unity of operations ı Lack of initiative, risk taking ability, awareness and self confidence ı Lack of infrastructure and organizational support ı Lack of special scheme of encouraging cooperatives of the visually impaired. 3.1.5 Community Based Rehabilitation : (Refer to Chapter on CBR for definition, importance, components and distinguishing features of the CBR)

DEFINITIONS

The realization of the dream of economic independence of the visually impaired person would necessitate their employment in the organized sector. It requires preparing them for employment and convincing the employers to extend them suitable employment opportunities. 3.2.1 Open Employment a. Definition: Open employment refers to the placement of a person in open competitive wage employment in the organized sector viz. ı with State as well as Central Government; ı institutions, corporations and companies; ı establishments, factories, production units; ı schools, colleges, universities and research organizations; ı other such establishments. b. Characteristics: Open employment has the following characteristics: ı Wage employment ı Competitive employment ı Employment is not due to charity or pity, it is due to production skills, abilities and qualifications ı All usual benefits available to the sighted persons are available to a visually impaired person also ı Conditions of employment and services conditions are the same for the visually impaired and the sighted ı Same terminal benefits are available to them c. Factors Affecting Open Employment i. Government intervention in terms of : ı augmenting training facilities; ı encouraging placement services; ı enacting and enforcing suitable laws on employment; ı supporting production cum training centres; ı extending administrative support. ii. Institutional support for : ı developing training programmes; ı seeking Government intervention; ı creating public awareness; ı developing vocational guidance and counselling services; ı motivating the visually impaired to compete for open employment. iii. Involvement of following agencies for extending employment opportunities : ı Trade Unions ı Employers' Federations Local administration 310 311 Service Clubs iv. Availability of : ı suitable employment aids; and ı adaptations in production processes and tasks. d. Merits ı Social integration of the visually impaired into the community ı Full industrial wages and all other benefits including terminal benefits ı Financial security and possibility of savings ı Diversified avenues of employment matching with individual expectations ı Public awareness regarding their potentials ı Possibility of new employment opportunities and spreading the concept of open employment ı Confidence among the fellow workers and the employers regarding their production potentials

The first two categories have been the most commonly initiated. There are other centres which have initiated training in a few trades which are certificate level courses recognized by the relevant governmental authorities. The vocational training centres offer training which is generally informal, not very structured, is traditional and not very systematic. The stipend offered to trainees is just enough for sustenance. The latest trend which is welcoming is to admit the blind persons in regular ITIs, technical school or professional training centres which ensure integration of the individual. The following issues need detailed discussion and consideration: a. Recognition of the training courses b. Viability of the training centres or the individuals c. Employment potential on completion of training d. Categories of disability to be covered e. Vocation or task-oriented training f. Level of integration during training and post training g. Cost of such training and level of grants etc. h. Evaluation of existing vocational training facilities and improvement thereof i. Futuristic Approach: For the special workshops to be more effective, some realistic and researched tips are: ı To reduce per capita cost on training, vocational training should be time limited, placement oriented and realistic. ı Focus at development of appropriate skills of the individuals and enhancing production of the centre. ı Apply for sales tax benefits on the purchase of raw material and sale of finished products, ı Encourage bulk and direct purchases, talk to manufacturers and get raw material at ex-works. ı Introduce proper inventory control ı Try for preferential sale to State departments, mass production, effective marketing etc. ı Proper production planning and man-job balancing is essential for efficiency. ı Muti-category approach would also render the training more cost effective. 3.2.2.1 Sheltered Workshops a. Definition: Sheltered workshop is a work-oriented rehabilitation facility with a controlled working environment and individual vocational goals which utilizes work experience and related services for assisting a visually impaired person to progress towards normal living and a productive vocational status. It is also considered a permanent, or semi-permanent vocational placement for individuals who are unable to find jobs in the community. It is to be considered a job and a place to go to work every day. It is a vocational setting, geared to take advantage of whatever vocational assets a client might have. It is meant to provide a resource in which an individual can make a contribution to the community. b. Distinguishing Features: A placement in Sheltered Workshop is generally not accompanied by a complex of therapeutic services. Minimal help is generally available for minimal problems. An individual in this setting is treated as a worker, a worker who is making positive contribution towards production. He is made to feel he is in a job, a job in which he should take pride. He is engaged in a productive work, a work he should enjoy doing (Manual). This endeavour has the following distinguishing features: 314 315 ı Suitable for a visually impaired who due to age, other disability or physical constraints cannot avail of open employment ı Keeps him confined without any hope for integration in society □ Advocates 'segregation and over-protection' and has a limited coverage ı His limited admission due to capacity constraint ı Limited choice of production activities and products c. Limitations ı Lack of legal status ı Trades selected have no compatibility with the existing job scenario due to controlled environment ı Most undesirable and undignified way of providing rehabilitation to the visually impaired who are, otherwise, capable of availing open employment. In other words, it restricts open employment opportunities. ı This approach is suitable for the aged and severely visually impaired persons with multiple disabilities. 3.2.2.2 Transitory

Employment a. Definition: A transitory workshop is a work related rehabilitation approach within a controlled working environment with the ultimate objective of open employment. b. Distinguishing Features ı Emphasis on movement of the individual whether his destination is the open labour market or extended employment ı Specifically structured as a work setting leading to open employment ı Offers vocational exploration and intensive on-the-job training ı Middle path approach of providing on-thejob training for a limited duration. Operationg Drill Machine Operationg a Lathe 316 317 c. Merits ı Encourages open employment provided the trades selected are compatible with the employment opportunities. ı Training is provided in simulated industrial settings, it becomes easier for a person to adjust to new environment when placed outside. ı Initial financial support as the person is rewarded on the basis of production performance. d. Benefits over Sheltered Workshops: Thus the transitory employment has the benefits over the sheltered workshops in terms of: ı initial financial assistance; ı work-oriented facilities; ı possibility of social integration on completion of on-the-job training; ı compatibility between training facilities and employment opportunities; ı leads to open employment; ı movement of individuals; ı extension of facilities to a higher number; ı wider choice of products. This is to very strongly emphasize that, if possible, the sheltered workshops should be transformed into the transitory employment workshops. At the same time, open employment is the most desirable mode of providing economic rehabilitation and restoring dignity to visually impaired persons . The transitory employment must not be considered a type of employment in itself. It is merely a tool of expediting open employment. 3.2.2.3 On-the-Job Training Centres a. Explanation: The On-the-Job training centre aims at providing work placement in a simulated industrial settings. It is a production activity and resembles an industrial set-up which has a primary objective of imparting employment oriented and task-based training to the individuals. It is a step ahead of sheltered workshop in respect of nature of placement and training opportunities. In this case, placement is provided for a limited duration which depends upon nature of production activities or skills of individuals. Its major focus is imparting skill training and actual work experience to individuals who due to lack of requisite qualification and age cannot be enrolled under the formal vocational training programmes. This programme is designed to provide actual work experience for individuals who have not been able to get jobs due to limited ocational potential, lack of employment opportunities and poor condition of general economy (Manual). The ultimate goal is to prepare the individuals for open placement or self employment on completion of on-the-job training. b. Distinguishing Features: This approach is a programme which provides training on a developmental continuum for individual who does not yet possess the motor skill necessary to perform work tasks. It provides progressive and appropriate training until the individual is ready to take a competitive employment or ready to live and operate in a vocational community (Manual). Such approach has the following distinguishing characteristics: 318 319 ı Rehabilitation agency assumes the financial obligation during the period of training. ı Purpose is to impart specific job-oriented training for a limited duration. ı Such programme is supported with employment & placement services. ı Individual is expected to perform production and services activities similar to a formal production unit. ı The programmes undertakes sale of its products onpreferential or competitive basis. ı It tends to be economically viable. ı The production activities at the centre are in consonance with the open employment opportunities ı The centre generally extends training activities to persons with all categories of disabilities. c. Merits: Such programme is more desirable - socially as well as financially. It has following advantages as compared to sheltered workshops as well as transitory employment: ı Economically more viable. ı Promotes appropriate self as well as open employment. ı Enables selective training and placement of individuals. ı Provides training on a developmental continuum. ı Provides progressive training until individual is ready to seek appropriate employment. ı Results into realistic vocational development. ı Ensures instilling social behaviour and social integration. ı Encourages training motor capabilities necessary to perform requisite works tasks. d. Limitations: Despite all its merits, on-the-job training is provided under simulated or sheltered conditions. It may always not be possible to find appropriate competitive wage employment for every individual. Such programme has the following limitations: ı The programme may give more importance to its profitability than quality of training ı The quality of on-the-job training may not be upto the mark ı The nature of training may not be in tune with employment opportunities ı Such programme may tend to emerge either as sheltered workshop or merely a production centre

SUMMARY

Introduction: The Work Station is a step between open placement and the training or the sheltered employment. The aspirant is placed under the conditions of actual employment but without formal employment. He is expected to: ı perform actual work; ı follow all the rules as applicable to other workers in terms of: * timings * uniform * work performance * other conditions of employment However, the employer has no obligation in terms of: ı payment of wages ı maintenance of attendance cards ı incidental expenses ı compensation for hazards ı insurance coverage The payment in terms of stipend, local transport, incidental expenses and insurance coverage may be provided by the local implementing agency or the Government department. At the end of the training, it has been observed that the employer normally absorbs the person in his firm or unit. b. Merits: It serves as an excellent arrangement wherein a person is under direct observation of the prospective employer who gets an opportunity to study his potentials, talents and adaptability to the job. The approach has the following merits: ı Demonstrates production potentials of the visually impaired. ı Convinces the co-workers regarding his production skills ı Enables the employment officers to: * perform task analysis * do individual planning * assist the VIP to adjust to the job ı Economical and cost effective as compared to other modes of training ı Ideal for a person who had no formal training ı Reduces the gap between on the job training or transitory employment and open placement 328 329 ı Establishes direct contacts between the trainee and the prospective employer and improves chances of open employment c. Factors Affecting Success: While the work station approach seems to be practical, result-oriented and cost effective, its success depends upon the following aspects: ı Proper selection of the job depending upon: * ability * skills * potentials and * interest ı Proper supervision by the employer and the placement officer ı Willingness of the employer to extend open employment on completion ı Involvement of the concerned officials ı Willingness of the implementing agency to incur expenditure on stipend, transportation and incidentals ı Most important, adoption of this approach by the: * employment exchanges * vocational rehabilitation centres * district rehabilitation centres * voluntary placement organizations 4.5 Social Reinforcement a. Definition: The Social Reinforcement approach portrays the employment process as an informal job information net-work in which the person with early knowledge of job openings selectively passes this information on to unemployed persons who are then likely to reward the job informants in a social way. b. Merits : ı Prevalent for employment in unorganized sector, small units where recruitment process has not been streamlined ı Effective where employment per se does not pose a very serious problem ı May be adopted as a supplementary tool for encouraging employment ı May enable the aspirants to seek employment under legal provisions for which they are otherwise eligible 4.6 Job Camps a. Definition: It involves inviting the prospective employers and unemployed disabled persons en masse and providing them appropriate conditions for mutual interaction for expediting the employment process. It has been adopted by special employment exchanges and the disabled welfare voluntary organization for the person with disabilities. b. Merits: ı Employer gets to meet, examine and interview a large number of disabled persons and to select the most suitable ones ı Person with disability faces a large number of interviews on the same day ı Suitable for developing countries where there is lot of unemployment and lengthy selection procedures are involved. 330 331 c. Limitations: ı A strong 'employer-pull' is essential □ Not a complete process by itself □ Merely one aspect of the employment process ı Incentives, motivation and follow-up are essential 4.7 Institutional Placement Services a. Procedure ı Circulate a detailed resume of the individual giving following details among the prospective employers: * educational qualification * past experience * area of specialization * age and areas of interest ı Display the offers received from the employers ı Encourage the individuals to apply for the job ı Provide facilities and infra-structure for the interviews ı Arrange initial interviews. This approach has proved very effective for the placement of various professionals, particularly in case of well established and reputed institutions and universities offering professional courses. The development institutions and placement agencies may adopt this technique for expediting employment in the following areas: ı physiotherapy, massage ı stenography, touch typing ı telephone operating ı computer programming, data entry ı social work, office management, marketing 4.8 Legislative Measures One of the means of creating employment opportunities for the disadvantaged groups is through enactment of suitable legislation in terms of: ı job reservation ı designation of specific types of jobs ı allocation of priorities or preferences in employment Use of continuity tester Training in telephone operating 332 333 The propriety and need for enacting legislation has always been debated at various platforms: 4.8.1 The arguments in favour of legislation are: ı Creates jobs for the target group ı Demonstrates Government support for employment ı Creates law enforcing agency which may force the employers in this regard ı Recognizes potentials and accords due status to the target group ı Supports other techniques of expediting employment 4.8.2 The arguments against such legislation are: ı Legislative compulsion is wrong in principle ı Against the constitutional right of freedom of employment ı Individuals so placed may feel they are employed on sufferance and not on merit ı May encourage them for the jobs for which they are not suitable ı Effectiveness of legislation as a social measure of promoting competitive open employment is doubtful ı May pre-empt other measures on encouraging employment. The legislation, by itself, may not result into employment. It needs to be supported by a strong law enforcing agency which may entail considerable expenditure on the public exchequer. Whatsoever may be the limitations of the legislative measures, their existence and implementation always support other measures. 4.8.3 The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 The Parliament of India enacted this Act on 22nd December, 1995 to give effect to the Proclamation on the Full Participation and Equality of the People's with Disabilities in Asia and Pacific Region. The President of India gave his assent to the Act on 1st January, 1996 and it came into force with effect from 7th February, 1996. This Act is very comprehensive and encompasses provision relating to monitoring and implementation machinery, prevention of disability, education, employment, affirmative action, nondiscrimination, research and manpower development and recognition of institutions for the persons with disabilities. The Chapter VI on employment envisages the following provisions: ı Identification of posts in the establishments which can be reserved for persons with disabilities (S- 32). ı Job reservation to the extent of 3 percent of the vacancies in every establishments in the posts identified for each disability (S-33). ı Seeking information from each establishment relating to appointments of persons with disabilities in such vacancies (S-34). ı Empowering Special Employment Exchanges to have access to any relevant record or documents in the possession of establishments as regard such reservation (S-35). ı Provision for vacancies not filled to be carried forward (S-36). ı Maintenance of records by the employers as regards filling of identified posts (S-37). 334 335 ı Formulation of special schemes by the local authorities and the appropriate Governments for ensuring employment of persons with disabilities (S-38). ı Reservation of 3 percent seats in all the educational institutes receiving grants from the Government (S-39). ı Reservation of 3 percent in all poverty alleviation schemes benefits for such persons (S-40) ı Incentives to employers both in public and private sectors to ensure that at least five percent work force is composed of such persons (S-41). The Persons with Disabilities Act has made very bold provisions for promoting competitive employments for the persons with disabilities. The outcome of these provisions would, however, depend upon its effective implementation. Similarly a number of State Governments have enacted legislation on job reservation. In Gujarat, reservation of one per cent of jobs in the establishments and undertakings employing more than 250 workers has resulted into employment of a large number of disabled persons. All these techniques on promoting employment are not mutually exclusive. A combination of various approaches may be very effective in expediting employment. Whatsoever approach is selected, the focus should always be the individual. The client centred approach is most essential. The economic rehabilitation should definitely be the ultimate objective of any rehabilitation programme.

CHECK YOUR PROGRESS

1. What criteria should be taken into consideration to design activities for the following
    - (a) Reading skills in HI children
    - (b) Mathematics skills in MR children
    - (c) Vocational skills in Locomotor impaired
    - (d) Writing skills in VI children
2. You are interested to design a curriculum for MR children. What should be the basis of curriculum design.

ASSIGNMENTS

1. Plan a programme to develop social skills in a pre-adolescent group of children with disabilities.
2. Plan activities to develop skills in mobility and ADL for children with Orthopedic Disabilities and Visual Impairment.
3. Plan pre –vocational programme for children with M.R and V.I.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop Keys to Success. How to
Achieve your
and Sarah Lyman Kravits. (1998) goals. Pub : Prentice Hall
N.J. 07458

2. Krishna Kumar (1986) The child's Language and
The Teacher –
A Handbook.

3. Lyndon W Searfoss Helping Children Learn To
Read.
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4. NIMH Sewnderabad (1989) Hand Book For The
Trainers of the
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Pub.: NIMH
Sewnderabad.

5. Paul A Albeoto Applied Behaviour
Analysis For Teacher
Anne C Troutman (1990) Merrill Pub. Co. ohio
43216.

UNIT – 3 : TEACHING PRINCIPLES

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Students who are blind or visually impaired need specialized instruction in order understand concepts in a highly visual world. This unique programming includes teaching through concrete and unifying experiences and learning by doing. As stated on the Impact on Development & Learning page, Lowenfeld, a leader in the field of visual impairments, identified three strategies to use when working with students who are blind or visually impaired. The three strategies are: concrete experiences, learning by doing, and unifying experiences.

OBJECTIVES

1. After studying this unit as a student you will be able to design activities for children with disabilities to develop skills in

   a) Reading

   b) Writing expression

   c) Mathematics ablities.

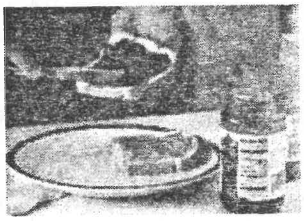
d) Vocation skills.

2. You will be able to execute activities to promote sensory integration among children with special needs.

DEFINITIONS

ConcreteExperiences

Interaction with a model are not the same as interaction with a real object, particularly if the student has not had direct contact and interaction with the real item. This is true for all students, but especially for students who are blind or visually impaired. For example, playing with a plastic animal has no meaning to the student who has not touched, smelled, heard and interacted with the real animal. It is important to provide interaction with actual objects first and then determine if the student can transfer that understanding to a model or a raised line drawing. Do not assume that a student has had experiences even with what you think may be common objects. For example, a student's family may have a van and the student may not have had contact with a car or all parts of a car. In this situation, it would be a good idea to discuss similarities and differences as you provide interaction with a variety of vehicles in the school parking lot.



LearnByDoing

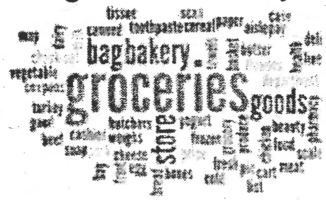
Students with visual impairments need to be directly involved with all aspects of the day in order to better understand the world including where materials are kept, the process of preparing food, the completion of chores and other daily routines. Involvement in these repeated routines will promote independence and minimize the student's dependence on others.

In an effort to demonstrate kindness and compassion, good intentioned adults and peers (or those in a hurry) sometimes create learned helplessness in students with disabilities. Coats magically hang themselves up, food magically appears in front of them and disappears when they are done, and toys that are thrown or dropped magically reappear. This is often referred to as "The Good Fairy Syndrome." It is important to replace "The Good Fairy Syndrome" with the desire to be a part of the action and to be independent. Avoid learned helplessness by providing the student with responsibilities.

Help develop responsibility by encouraging the students do as much as possible for themselves. The students should be expected to move about their familiar classroom to obtain materials or information and be responsible for their own belongings. When teaching the student a process that includes several steps, make sure the students participate in all the steps from the beginning to the end of the process. If the student only completes one or a few of the steps, they may be unaware of all of the other steps that someone else completed. As soon as possible, let the student move through the activity independently so they do not become dependent on someone moving them through the motions.

If a student cannot participate independently, explore ways that the student can be assisted through the activity, allowing him to complete the steps that he can do independently. Gradually fade assistance until the student can be independent. Some students, particularly those who are blind, will need to be gently moved through the activity in order to understand what is expected. This is best when the facilitator is behind the student so that the facilitator's body is oriented the same way as the student's body. These repeated opportunities and natural experiences will help the student make associations. Responsibility and independence are essential in the student reaching their greatest potential.

Another essential skill the student must learn is that of problem solving. When a student needs help, show the student alternative ways of handling a situation, rather than automatically providing the support. Challenge the student to think of alternatives and reinforce the student when he or she comes up with a solution. Last, but not least, never do anything for the student that they can do for themselves. You are not doing the student any favors by teaching them to be dependent on you.



UnifyingExperiences

Teaching in thematic units can help a student make connections between and among the topics of instruction that are discussed. Units expand vocabulary, concepts, and skills beyond those which can be experienced incidentally in daily routines or in isolation. Deliberate, relevant and purposeful lesson planning is critical for all students. Intentionally incorporate concept development into the lesson plans. Most concepts must be directly taught and not assumed that the student is learning these skills independently or through passive listening. Watch for situations for which the student has had no prior experience (e.g. foods in different forms: corn-on-the cob, cooked corn, popcorn, dried corn; matter in altered form: water, steam, ice, dew, condensation; sources of things: milk comes from cows; occupations: what jobs people perform; etc.)

Be sure to plan lessons that challenge each student. Each student must participate at a level they can. Facilitate and guide learning to provide a supportive "scaffold" that enables each child to move to the next level of independent functioning. Learning activities should be developed to accommodate differences in ability and interest. Incorporate task analysis, backward chaining, modeling, motoring, demonstration, use of routines, reinforcement. In order to keep in mind what each student is working on – create charts that display items from each student's IEP and hang on the wall or cabinet (remember to not identify the student, but instead use a color, shape or other type of code).

SUMMARY

If you are a classroom teacher, therapist or administrator unfamiliar with working with students who are blind or visually impaired, this site will assist you in preparing and creating a learning environment that is adapted to meet the unique needs of the students and to help you confidently teach them. It is common for teachers who are unfamiliar with working with students with visual impairments to feel apprehensive, but with the support of a Teacher of Students with Visual Impairments, you will effective and successfully meet the student's unique needs.

If you are entering, or currently in the vision field, you will find information related to all areas of the Expanded Core Curriculum as well as other resources related to all aspects of instructing students with visual impairments and adapting the environment, materials and method of instruction. Within this site you will find information on teaching strategies, environmental & material adaptations including special devices, and make curricular adaptations to meet each students unique visual needs.

CHECK YOUR PROGRESS

1. What criteria should be taken into consideration to design activities for the following
   - (e) Reading skills in HI children
   - (f) Mathematics skills in MR children
   - (g) Vocational skills in Locomotor impaired
   - (h) Writing skills in VI children
2. You are interested to design a curriculum for MR children. What should be the basis of curriculum design.

SUGGESTED ASSIGNMENTS

1. Plan a programme to develop social skills in a pre-adolescent group of children with disabilities.
2. Plan activities to develop skills in mobility and ADL for children with Orthopedic Disabilities and Visual Impairment.
3. Plan pre –vocational programme for children with M.R and V.I.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop and Sarah Lyman Kravits. (1998) — Keys to Success. How to Achieve your goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986) — The child's Language and The Teacher – A Handbook.

3. Lyndon W Searfoss John E. Readence (1994) — Helping Children Learn To Read. Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) — Hand Book For The Trainers of the Mentally Retarded Persons. Pub.: NIMH Sewnderabad.

5. Paul A Albeoto Anne C Troutman (1990) — Applied Behaviour Analysis For Teacher Merrill Pub. Co. ohio 43216.

UNIT – 4 : EXPANDED CORE CURRICULUM-- CONCEPT AND AREAS

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

he Expanded Core Curriculum (ECC) is the body of knowledge and skills that are needed by students with visual impairments due to their unique disability-specific needs. Students with visual impairments need the expanded core curriculum in addition to the core academic curriculum of general education. The ECC should be used as a framework for assessing students, planning individual goals and providing instruction.

OBJECTIVES

1. After studying this unit as a student you will be able to design activities for children with disabilities to develop skills in

   e) Reading

   f) Writing expression

g) Mathematics ablities.

h) Vocation skills.

2. You will be able to execute activities to promote sensory integration among children with special needs.

DEFINITIONS

Compensatory or Functional Academic Skills, Including Communication Modes

(Note: for this area of the expanded core curriculum for blind and visually impaired students, a distinction must be made between compensatory skills and functional skills. Compensatory skills are those needed by blind and visually impaired students in order to access all areas of core curriculum. Mastery of compensatory skills will usually mean that the visually impaired student has access to learning in a manner equal to that of sighted peers. Functional skills refers to the skills that students with multiple disabilities learn that provide them with the opportunity to work, play, socialize, and take care of personal needs to the highest level possible.)

Compensatory and functional skills include such learning experiences as concept development, spatial understanding, study and organizational skills, speaking and listening skills, and adaptations necessary for accessing all areas of the existing core curriculum. Communication needs will vary, depending on degree of functional vision, effects of additional disabilities, and the task to be done. Children may use braille, large print, print with the use of optical devices, regular print, tactile symbols, a calendar system, sign language, and/or recorded materials to communicate. Regardless, each student will need instruction from a teacher with professional preparation to instruct students with visual impairments in each of the compensatory and functional skills they need to master. These compensatory and functional needs of the visually impaired child are significant, and are not addressed with sufficient specificity in the existing core curriculum.

Orientation and Mobility

As a part of the expanded core curriculum, orientation and mobility is a vital area of learning. Teachers who have been specifically prepared to teach orientation and mobility to blind and visually impaired learners are necessary in the delivery of this curriculum. Students will need to learn about themselves and the environment in which they move - from basic body image to independent travel in rural areas and busy cities. The existing core curriculum does not include provision for this instruction. It has been said that the two primary effects of blindness on the individual are communication and locomotion. The expanded core curriculum must include emphasis on the fundamental need and basic right of visually impaired persons to travel as independently as possible, enjoying and learning from the environment through which they are passing to the greatest extent possible.

Social Interaction Skills

Almost all social skills used by sighted children and adults have been learned by visually observing the environment and other persons, and behaving in socially appropriate ways based on that information. Social interaction skills are not learned casually and incidentally by blind and visually impaired individuals as they are by sighted persons. Social skills must be carefully, consciously, and sequentially taught to blind and visually impaired students. Nothing in the existing core curriculum addresses this critical need in a satisfactory manner. Thus, instruction in social interaction skills becomes a part of the expanded core curriculum as a need so fundamental that it can often mean the difference between social isolation and a satisfying and fulfilling life as an adult.

Independent Living Skills

This area of the expanded core curriculum is often referred to as "daily living skills." It consists of all the tasks and functions persons perform, in accordance with their abilities, in order to lead lives as independently as possible. These curricular needs are varied, as they include skills in personal hygiene, food preparation, money management, time monitoring, organization, etc. Some independent living skills are addressed in the existing core curriculum, but they often are introduced as splinter skills, appearing in learning material, disappearing, and then re-appearing. This approach will not adequately prepare blind and visually impaired students for adult life. Traditional classes in home economics and family life are not enough to meet the learning needs of most visually impaired students, since they assume a basic level of knowledge, acquired incidentally through vision. The skills and knowledge that sighted students acquire by casually and incidentally observing and interacting with their environment are often difficult, if not impossible, for blind and visually impaired students to learn without direct, sequential instruction by knowledgeable persons.

Recreation and Leisure Skills

Skills in recreation and leisure are seldom offered as a part of the existing core curriculum. Rather, physical education in the form of team games and athletics are the usual way in which physical fitness needs are met for sighted students. Many of the activities in physical education are excellent and appropriate for visually impaired students. In addition, however, these students need to develop activities in recreation and leisure that they can enjoy throughout their adult lives. Most often sighted persons select their recreation and leisure activity repertoire by visually observing activities and choosing those in which they wish to participate. The teaching of recreation and leisure skills to blind and visually impaired students must be planned and deliberately taught, and should focus on the development of life-long skills.

Career Education

There is a need for general vocational education, as offered in the traditional core curriculum, as well as the need for career education offered specifically for blind and visually impaired students. Many of the skills and knowledge offered to all students through vocational education can be of value to blind and visually impaired students. They will not be sufficient, however, to prepare students for adult life, since such instruction assumes a basic knowledge of the world of work based on prior visual experiences. Career education in an expanded core curriculum will provide the visually impaired learner of all ages with the opportunity to learn first-hand the work done by the bank teller, the gardener, the social worker, the artist, etc. It will provide the student opportunities to explore strengths and interests in a systematic, well-planned manner. Once more, the disadvantage facing the visually impaired learner is the lack of information about work and jobs that the sighted student acquires by observation.

Because unemployment and underemployment have been the leading problem facing adult visually impaired persons in the United States, this portion of the expanded core curriculum is vital to students, and should be part of the expanded curriculum for even the youngest of these individuals.

Technology

Technology is a tool to unlock learning and expand the horizons of students. It is not, in reality, a curriculum area. However, it is added to the expanded core curriculum because technology occupies a special place in the education of blind and visually impaired students. Technology can be a great equalizer. For the braille user, it allows the student to provide feedback to teachers by first producing material in braille for personal use, and then in print for the teacher, classmates, and parents. It gives blind persons the capability of storing and retrieving information. It brings the gift of a library under the fingertips of the visually impaired person. Technology enhances communication and learning, as well as expands the world of blind and visually impaired persons in many significant ways. Thus, technology is a tool to master, and is essential as a part of the expanded core curriculum.

Sensory Efficiency Skills

Sensory efficiency includes instruction in the use of residual vision, hearing, and the other senses; for example, learning how to use optical devices, hearing aids, augmentative communication devices, and the like. In addition, learning how to integrate all remaining senses to counter the impact of any missing or impaired sense is also integral to this area; for example, learning how to use tactual, gustatory, and olfactory input rather than visual cues to identify one's personal possessions, or using hearing and the other senses to identify people one knows without visual cues, fits into this area.

Self-Determination

This area of the ECC highlights the importance of believing in oneself, while understanding one's abilities and limitations. Students learn from successes and failures how to achieve one's goals in life. Self-determination is the ability for people to control their lives, reach goals they have set and take part fully in the world around them.

Bringing together all of these skills learned in the expanded core curriculum produces a concept of the blind or visually impaired person in the community. It is difficult to imagine that a congenitally blind or visually impaired person could be entirely at ease and at home within the social, recreational, and vocational structure of the general community without mastering the elements of the expanded core curriculum. What is known about congenitally blind and visually impaired students is that, unless skills such as orientation and mobility, social interaction, and independent living are learned, these students are at high risk for lonely, isolated, unproductive lives. Accomplishments and joys such as shopping, dining, attending and participating in recreational activities are a right, not a privilege, for blind and visually impaired persons. Responsibilities such as banking, taking care of health needs, and using public and private services are a part of a full life for all persons, including those who are blind or visually impaired. Adoption and implementation of a core curriculum for blind and visually impaired students, including those with additional disabilities, will assure students of the opportunity to function well and completely in the general community.

The components of the expanded core curriculum present educators with a means of addressing the needs of visually impaired children with additional disabilities. The educational requirements of this population are often not met since the lack of vision is considered "minor", especially when the child is severely impacted by cognitive and physical disabilities. Each area in the expanded core curriculum can be further defined to address the educational issues facing these children and assist parents and educators to fulfill their their needs.

This expanded core curriculum is the heart of the responsibility of educators serving visually impaired students. These areas are not adequately addressed by regular classroom teachers, nor should they be, for this is the core curriculum that is essential to students who are blind and visually impaired, and it epitomizes their "...right to be different..."

SUMMARY

The term expanded core curriculum (ECC) is used to define concepts and skills that often require specialized instruction with students who are blind or visually impaired in order to compensate for decreased opportunities to learn incidentally by observing others. In addition to the general education core curriculum that all students are taught, students with visual impairments, starting at birth, also need instruction in the ECC. The ECC areas include (A) needs that result from the visual impairment that enable the student "to be involved in and make progress in the general education curriculum; and (B) other educational needs that result from the child's disability" as required by IDEA (34 CFR 300.320 (a)(2)(A)(B)). Texas Education Code (TEC) 30.002(c)(5) and (e)(5) require the flexibility of school districts to make arrangements for services to occur "beyond regular school hours to ensure the student learns the skills and receives the instruction" in the ECC.

With the passage of Senate Bill 39 in 2013 (Texas 83rd Legislative Session), evaluation in all areas of the ECC is required for students with visual impairments. Priority needs must be identified by the IEP team and instruction provided in these areas.

Nine Areas of the ECC

Assistive Technology

Assistive technology is an umbrella term that includes assistive and adaptive tools as well as instructional services that can enhance communication, access, and learning. It can include electronic equipment such as switches, mobile devices, and portable notetakers; computer access such as magnification software, screen readers, and keyboarding; and low-tech devices such as an abacus, a brailler, Active Learning materials (e.g., Little Room®), and optical devices.

Career Education

Career education will provide students with visual impairments of all ages the opportunity to learn through hands-on experiences about jobs that they may not otherwise be aware of without the ability to observe

people working. They also learn work-related skills such as assuming responsibility, punctuality, and staying on task. Career education provides opportunities for students to explore and discover strengths and interests and plan for transition to adult life.

Compensatory Skills

Compensatory skills include skills necessary for accessing the core curriculum including concept development; communication modes; organization and study skills; access to print materials; and the use of braille/Nemeth, tactile graphics, object and/or tactile symbols, sign language, and audio materials.

Independent Living Skills

Independent living skills include the tasks and functions people perform in daily life to increase their independence and contribute to the family structure. These skills include personal hygiene, eating skills, food preparation, time and money management, clothing care, and household tasks. People with vision typically learn such daily routines through observation, whereas individuals with visual impairments often need systematic instruction and frequent practice in these daily tasks.

Orientation and Mobility (O&M)

O&M instruction enables students of all ages and motor abilities to be oriented to their surroundings and to move as independently and safely as possible. Students learn about themselves and their environments, including home, school, and community. O&M lessons incorporate skills ranging from basic body image, spatial relationships, and purposeful movement to cane usage, travel in the community, and use of public transportation. Having O&M skills enables students to acquire independence to the greatest extent possible, based on their individual needs and abilities.

Recreation and Leisure

Being unable to observe others reduces awareness of recreation and leisure options. Instruction in recreation and leisure skills will ensure that students with visual impairments will have opportunities to explore, experience, and choose physical and leisure-time activities, both organized and individual, that they enjoy. This instruction should focus on the development of life-long skills.

Self-Determination

Self-determination includes choice-making, decision-making, problem solving, personal advocacy, assertiveness, and goal setting. Students with visual impairments often have fewer opportunities to develop and practice the specific skills that lead to self-determination. Students who know and value who they are and who have self-determination skills become effective advocates for themselves and therefore have more control over their lives.

Sensory Efficiency

Sensory efficiency includes instruction in the use of vision, hearing, touch, smell, and taste. It also addresses the development of the proprioceptive, kinesthetic, and vestibular systems. Learning to use their senses efficiently, including the use of optical devices, will enable students with visual impairments to access and participate in activities in school, home, and community environments.

Social Interaction Skills

Social interaction skills include awareness of body language, gestures, facial expressions, and personal space. Instruction also includes learning about interpersonal relationships, self-control, and human sexuality. Almost all social skills are learned by visually observing other people. Instruction in social interaction skills in school, work, and recreational settings is crucial. Having appropriate social skills can often mean the difference between social isolation and a fulfilling life as an adult.

CHECK YOUR PROGRESS

1. What criteria should be taken into consideration to design activities for the following
   - (i) Reading skills in HI children
   - (j) Mathematics skills in MR children
   - (k) Vocational skills in Locomotor impaired
   - (l) Writing skills in VI children
2. You are interested to design a curriculum for MR children. What should be the basis of curriculum design.

SUGGESTED ASSIGNMENTS

1. Plan a programme to develop social skills in a pre-adolescent group of children with disabilities.
2. Plan activities to develop skills in mobility and ADL for children with Orthopedic Disabilities and Visual Impairment.
3. Plan pre –vocational programme for children with M.R and V.I.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop and Sarah Lyman Kravits. (1998) Keys to Success. How to Achieve your goals. Pub : Prentice Hall N.J. 07458

2. Krishna Kumar (1986) The child's Language and The Teacher – A Handbook.

3. Lyndon W Searfoss John E. Readence (1994) Helping Children Learn To Read. Pub. Allyn and Bacon MA 02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The Trainers of the Mentally Retarded Persons. Pub.: NIMH Sewnderabad.

5. Paul A Albeoto Anne C Troutman (1990) Applied Behaviour Analysis For Teacher Merrill Pub. Co. ohio 43216.

UNIT – 5 : COMMONLY USED LOW COST AND ADVANCED ASSISTIVE DEVICES

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Assistive devices for the visually impaired can be divided into the following six categories: 1. Educational Devices 2. Mobility Devices 3. Vocational Devices 4. Daily Living Devices 5. Low Vision Devices 6. Psychological Tests for Vocational Assessment and Training 1. Educational Devices The educational devices can be further classified into the following broad eight categories: 1.1 Braille Duplicators and Writers 1.2 Writing Devices 1.3 Braille Paper 1.4 Talking Books and Tape Recorders 1.5 Reading Machines 1.6 Braille Computers 1.7 Mathematical Devices 1.8 Geography Devices 1.9 Science Devices 1.1 Braille Duplicators and Writers 1.1.1 Thermoform Machine: 'Indutherm' is an indigenous semi-automatic Braille duplicating machine. It is useful for taking out multiple copies of the Braille matter on the Indutherm (or Braillon) sheets from the master generally prepared on the Braille paper. This machine operates on the principle of vacuum and high temperature.

OBJECTIVES

1. After studying this unit as a student you will be able to design activities for children with disabilities to develop skills in
   i) Reading
   j) Writing expression
   k) Mathematics ablities.
   l) Vocation skills.
2. You will be able to execute activities to promote sensory integration among children with special needs.

DEFINITIONS

i. Interline Braille Frame: is used for writing standard character interline Braille. The frame comprises a wooden board, a metal guide, a reversible paper clamp and a stylus. The clamp fits at the top of the board and has a small swivel stud for locking and holding Braille paper. When one side of the paper has been Brailled, the clamp with the paper still held, is turned over as 200 201 a unit. The binding margin is made automatically. ii. Taylor Postcard Frame: It is used for writing small character Braille on one side of the paper. The corner pins are arranged in such a way that the Braille can be read without removing the paper from the frame; when the top section is lifted, the paper remains attached to it. iii. Pocket Braille Frame: The four-line pocket Braille frame produces small character Braille on one side of the Braille paper. This is specially used for making small and occasional notes. iv. Stylii: These are produced with handles of various shapes to suit individual needs. The points of all stylii are made of stainless steel and the handles are of polished hardwood or synthetic material. v. Braille Kit: is a rexine coated or a decorative wood box 36 Cms. by 28.5 Cms. with a weight of 3085 Gms. and contains the following items: 1 Braille Writing Frame 1 Braille Writing Pocket Frame 1 Rubber Sheet 1 Foot Ruler 1 Compass

Set ı Two Stylii ı Folding Stick or Abacus and ı Signature Guide. vi. Pragnya Sketching Device Mrs. Pragnya Bhatt and Mr. Dilip Bhatt, father of a low vision child, Nikunj and volunteers of Blind People's Association have developed an innovative sketching device. It enables a visually impaired child as well as a low vision child to create simple sketches and diagrams out of a thread. It is based on principle of using acrylic thread as "writing ink" and nylon fabric fastener strips as a "writing slate". Product Design: Acrylic thread of a contrast colour that works as refill is passed through the empty body of an open ended ball pen, keeping the other end attached to bobbin spool. The thread is wound on the spool that rotates about a wire axle, attached to the upper part of the ball pen. The nylon fastener stripes are stitched together width wise and pasted on the wooden board to make 1'x1' area. Operation: The child holds the pen as any other normal pen for a sighted person and makes contact of the thread over the slate surface. Keeping continuous touch with the surface, the child glides the pen in different directions and the thread delivery is maintained smoothly through the rotating spool. 202 203 A line can be terminated by snapping off the thread by using a sharp stationary blade. A continuous running thread can also make different shapes like circles, rectangles, curved lines, letters, graphic symbols, maps etc. The drawn picture can be easily "erased" by simply pulling away the thread from the slate surface and rewinding it again over the spool. The child can immediately feel the shape by moving fingers over the thread surface and add, correct or erase the line quickly. It enables interaction of the child with the writing media and encourages drawing of various objects. A low vision child may see the shapes by holding the board close to eyes. Advantages ı Self operated excellent user friendly device ı Serves as useful educational media for the teaching personnel ı Operates on concept of "draw as you think" which is better as compared to tactile devices where "embossing" is carried out on the reverse side of the paper, metal sheet etc. to get mirror image of the actual profile. ı Simple design using readily available components. ı Easy to manufacture, even in the rural areas. ı Low cost and affordable. ı No training manual required as it is easy to operate. Awards i. National Award: Mr. Dilip Bhatt and Mrs. Pragnya Bhatt have been conferred the National Award for outstanding technological invention in the field of welfare for the Persons with Disabilities by the President of India on 3rd December 1997. ii. National Research and development Corporation (NRDC) Science & Technology Award: The inventors were also conferred Science & Technology Award on 26th January 1998 on the occasion of Republic Day. iii. World Intellectual Properties Organization (WIPO) Gold Medal for the best product patented from the developing countries. iv. Displayed in the exhibition titled "Heralding the New Millennium" on the occasion of 87th session of the Indian Science Congress during 3-7 January, 2000 at Pune as "Innovative India". v. Patent has already been filed for this device under Patent Cooperative Treaty (PCT) by the National Research and Development Corporation, New Delhi. Manufacturers a. National Rehabilitation Engineering Institute, Blind People's Association, Vastrapur, Ahmedabad-380 015 Phone : 6305082, 6304070 Gram : "BLINAB" Fax: 6300106 E-mail : bpa@vsnl.com Web: http ://education.vsnl.com./bpa_ahmedabad b. National Institute for the Visually Handicapped, 116, Rajpur Road, Dehradun - 248 001 Uttar Pradesh. Phone : 744491, 744578 Fax: 748147 Gram : "NIVH" Email : nivhddn@nde.vsnl.net.in c. Moksha Enterprises 204 205 1.3 BraillePaper : The standard size of Braille paper is 22"X28" and weight 8.6 kg. per gross. Manufacturers a. Titaghar Paper Mills Ltd. b. Andhra Pradesh Paper Mills Ltd. c. West Coast Paper Mills Ltd. d. Rohtas Paper Mills Ltd. e. Orient Paper Mills Ltd. 1.4 Talking Books and Tape Recorders 1.4.1 Talking Books: The material recorded on cassettes has emerged to be the most popular mode of imparting education to visually impaired persons. As Braille books are very heavy and many newly blind persons are not able to learn Braille easily, talking books are emerging to be the most viable alternative. For listening to the talking books, the conventional cassette players with the compact cassettes with a playing time of either 60 or 90 minutes is generally used. The Major Talking Book Libraries in the country are: a. Talking Book Library, NIVH, Dehradun b. M. P. Shah Talking Book Library, National Association for the Blind, 11, Khan Abdul Gaffar Khan Road, Worli Seaface, Mumbai 400025 Phone : (022) 4935370, 4936930 Fax: 91-22-4932539 Email : nab@giasbm01.vsnl.net.in d. A N Kinariwala Talking Book Library, BPA, Ahmedabad e. Blind Relief Association, Lal

Bahadur Shastri Marg, New Delhi - 110 003 Phone : 436 1376 Gram : "BLINCENTRE". f. Poona Blind Men's Association, 82, Rasta Peth, Pune Phone : (0212) 626433 627 036 Fax: 628741. Many regional and district level development agencies for the visually impaired have their own small talking book libraries. 1.4.2 Digital Tapeless Recorder: Kun Yoong Trading Co. RM.1302, Hwanghwa Bldg., #832-7, Yeoksam-Dong, Kangnam-Ku, Seoul, Korea has developed Digital Tapeless Recorder (Check-back) for the Blind. The blind people can use it alone without someone's help. It has a special voice prompt for the blind which includes a voice guide, easy research mode, volume adjustment and option for use of earphone. 1.5 Reading Machines i. Kurzweil Reading Machine: A portable optical scanner that reads type-set or type-written text and turns it into speech. Its features include: ı a large memory to provide improved processing of incoming text; ı an automatic contrast control; ı tools for format analysis; ı multi-lingual capabilityfor textinany of these veral languages; ı communication interface which allows it to serve as an input or output device with other data or text processing equipment. 206 207 Manufacturer: Kurzweil Educational Systems, Inc. 411 Waverley Oaks Road, Waltham, Massachusetts 02154, USA. Tel.: +1617 893 8200 Fax: +1617 893 4157 Email : info@kurzweiledu.com Web : http://www.kurzweiledu.com Supplier in India: Empire Industries Ltd., Empire House, 414, Senapati Bapat Marg, Mumbai - 400 013 ii. Optacon: is a book-sized electronic device with a movable camera, the size of a pocket knife and a tactile screen the size of a fingertip which presents a tactile image on an array of vibratory pins. The reader passes the camera over printed material with his right hand and his left index finger feels in vibratory relief the image the camera sees. The manufacturer claims that an experienced Optacon user reads up to 90 words per minute, about half his Braille reading speed. Manufacturer: Telesensory Systems Inc., P.O. Box 7455, Mountain View, California 94039-7455, U.S.A. Tele : +1415335 1800 Fax: 1414 335-1816, Email : tele@netcom.com, Web : http://www.telesensory.com/index.html 1.6 Braille Computers i. Braille Window: is the Braille-display for connection to all sort of IBM compatible personal computers. ii. Keytone: is a portable information handling, wordprocessor and computer access device that talks to its user. iii. EHG-BW/ 2-PIEZO is a monitor and key board which provides output in raised dots and can be conveniently used by the visually impaired persons. iv. Galaxy Piezo: is a special computer for the visually impaired and it gives output in embossed dots. v. Galaxy speech: is a special computer for the visually impaired with speech output vi. Braille'n Speak: is pocket size note taker. It can be used for word processing, as a calculator, as a clock and a calendar. It can store 200 pages of Braille text. vii.Versa-Braille II+: is recognized as a convenient Braille operating system. It can be used for editing, programming and word processing. The input is from six keys and output is in the form of raised dots. It is a product of Telesensory Systems Inc. viii. Index Braille: Index Braille is a Sweden based privately owned business with a mission devoted to development and production of Braille Embosser. The company has introduced Double-sided Braille Embosser, popularly known as "Index Everest". It has a high speed Interpoint Braille Embosser which uses normal cut sheet. Over the years, the Everest has proved to be one of the most reliable Embossers on the market. 208 209 Manufacturer Index Braille Hantverkvagen 20, Box 155, S-95423 Gammelstad,Sweden Phone : +46-920 203080 Fax : +46-920 203085 E-mail : info@idexbraille.com Web : www.indexbraille.com Distributor for India Sparsh Products 151-5, Raipur, Road, Dehradun - 248001 Uttar Pradesh Phone : +91-135 735011 Fax : +91-135 651108, 650944 E-mail : reetarao@del3.vsnl.net.in ix. Speech Synthesizers: A speech access system converts text from a computer into spoken words. It is the hardware device that does the speaking in a speech access system. a. External device: It connects to a computer externally and comes with a speaker and a socket for headphones and can be moved around to different machines. b. Internal device: It comes as a chip or a circuit board that must be inserted inside the computer with sockets for speakers and headphones. It can be moved around to different machines, it works faster than an external device. c. Soft-ware based device: It is loaded as software on a compatible computer and it gives speech out through the sound system of the computer itself. The Microsoft Voice is useful for reading the documents and for operating window commands with the help of multimedia kit. Important features of synthesizers include ı voice quality ı speed at which text is converted to speech ı memory requirements, and ı compatibility of the synthesizer to the computer (Mac or PC) and the number of languages available. d. Language software: The Indian Institute of Technology (IIT) Chennai has developed Braille Software as well as Language Software which enables a visually impaired person to access computers for Braille as well as language outputs in all the Indian languages. The Vidya Vriksha Training Centre for the Disabled, a Chennai based NGO is imparting training to visually impaired persons in the use of software. It is also providing the software completely free of cost to the users and the institutions. It has also developed a system of keyboard mapping and operations in Indian languages and instruction manual for use of the special version of the ITI Multilingual Software. 1.7 Mathematical Devices i. Taylor Arithmetic Frame: The surface of this aluminum frame is divided into star shaped holes with eight angles, thus allowing the double-ended metal types to be placed in different positions according to a set system. This frame is suitable for teaching arithmetic to visually impaired persons. 210 211 ii. Arithmetic and Braille Writing Slate: This has a Arithmetic frame on one side and a Writing slate on the other. It also has reversible type clamp and two guide lines supplied with a wooden stylus. iii. Abacus: A simple instrument for performing rapid arithmetical calculations. It consists of a frame holding thirteen vertically arranged rods on which beads slide up and down. The beam supporting the beads is marked with a raised dot at each rod position and a raised bar between every third rod. The bars serve to indicate the decimal point and other units of decimal measure. iv. Talking Calculator: Audible calculator in synthesized speech. Useful for calculation, clock, alarm and calendar. Manufactured by Casio and Sharp companies of Japan. v. Primary Mathematics Kit: specially designed for the visually handicapped children to comprehend mathematical concepts. It contains: ı a plastic box ı slide strips ı number boards ı fractional strips ı Braille clock ı geometrical shapes - geometrical figure tray ı magnetic board, and ı geometrical devices. Manufacturer : NIVH, Dehradun vi. Spur Wheel: A serrated wheel revolving in a plated metal handle. It is used for making continuous embossed lines on the reverse side of the paper. vii.Compass Set: It includes a foot ruler, a protractor and a set square in nylon and a spur wheel. It enables visually impaired students to use the same techniques as his sighted counterpart. The foot ruler and set square have embossed markings for their convenience. The compass has a removable component fitted with a toothed wheel for drawing embossed dotted lines on the reverse of the Braille paper. viii. Geometry Mat: A sheet of rubber for use as a base in conjunction with the spur wheel and Braille paper for making geometrical drawings. ix. Opisometer: A bell rings each time the disc moves a distance of one meter. Useful for mapping and understanding mathematical problems in length and perimeter. x. Other mathematical devices are: ı Three-in-one: Arithmetic Frame, Writing Frame and Abacus ı Composite Braille Slate: Abacus, Arithmetic Frame, Rubber Mat and Wooden Frame ı Graded Abacus ı Fraction Boards ı Counting Device ı Hundred, Tens Units Board ı Arithmetic as well as Algebraic Types ı Geometric Shapes and Solids Suppliers of educational devices are: a. NREI, BPA, Ahmedabad b. NIVH, Dehradun c. Asian Power Cyclopes 212 213 d. Moksha Enterprises e. Voltas Ltd., Kaybee Cell, Volkart Building, 19 J N Heredia Marg Ballard Estate, Mumbai - 400 038 f. Advance Engineering Works, 22 Lytton Road, Dehradun - 248 001 Uttar Pradesh, Telefax : (0135) 654530 g. Artificial Limbs Manufacturing Corporation, G T Road, Kanpur - 208 016 Uttar Pradesh Phone : (0512) 250173 Fax : 252617 Gram : "Artlimbs" h. Pneumatic Controls, 35-B, Rama Road, New Delhi 110 015 i. NAB Louis Braille Memorial Research Centre, Rustom Alpaiwala Complex, 124, Cotton Depot, Cotton Green, Mumbai - 400 033 Phone : (022) 3756802 1.8 Geography Devices 1.8.1 Sensory Quill: It is an equipment for obtaining a raised line format of any writing or drawing. The height and texture of the line can be altered. Useful in learning handwriting skills, mathematics, science, drawing and spellings. Manufacturer: V. R. Vardhman International, Vardhman House, 1, Raj Block, Naveen Shahadara, New Delhi 110 032 1.8.2 Maps and Globes : i. Raised Relief Plastic Maps: Vacuum formed plastic maps printed in strong colours with names in letterpress for the benefit of person with low vision. The main towns are shown by large dots and principal rivers by depressions. Braille symbols denote the names of seas, main rivers and towns, a key to which is given in the guide. The boundaries on political maps are indicated by raised lines. In India, political and physical maps are available for Asia and India. The vacuum printed diagrams are also available for various body systems, anatomy, physiology etc. at the following address: a. Bharat Educational Stores, Chippi Tank, Meerut Uttar Pradesh b. Krishna Models Manufacturing Co. Ltd., Nai Sarak, Near Chandni Chowk, New Delhi- 110 015 ii. Relief Globes: A plastic globe in textured relief. The land masses are shown in different colours. The principal towns are indicated by raised dots; rivers and lakes by depressions. Dotted lines indicate the tropics, arctic, and antarctic circles, the international date-line and meridians. The names of oceans and the main land are shown in Braille. Nystrom's Bathymetric World Model is raised relief map of the world with oceans drained. All under water features are exposed. A cassette recording explaining the features is supplied with the product. iii. Braille Diagram Board: Metal sheet fixed on a board with closely formed holes in which round headed 214 215 pins are stuck to form maps and diagrams. Manufacturer: NIVH, Dehradun 1.9 Science Devices 1.9.1 Conductivity Apparatus: Demonstrates the difference in the heat conductivity of copper and iron. It consists of a wooden stand with horizontal heating rods. 1.9.2 Three Dimensional Raised Relief Plastic Charts: Rigid PVC sheet, printed and formed in multi-colours. The following charts are available: i. Botany General: includes typical plant cell, plant meiosis, plant mitosis, Ribo-Nuleic Acid, Bacterial forms, Spirogyra and Funaria - common Moss in Botany ii. Botany Advance: depicts fertilization, T. S. dicot leaf, dicot stem, types of placentation iii. Zoology: Vertebrate and Invertebrate iv. Human Physiology and Human Body Systems including human skeleton, circulation system, heart, nervous system, a section of the brain, muscles, digestive system, the ear, the nose, and the eye. v. Human Reproduction includes male and female reproduction organs, fertilization and foetus

SUMMARY

Wheelchair

Wheelchairs are devices that can be manually propelled or electrically propelled and that include a seating system and are designed to be a substitute for the normal mobility that most people enjoy. Wheelchairs and other mobility devices allow people to perform mobility related activities of daily living which include feeding, toileting, dressing grooming and bathing. The devices comes in a number of variations where they can be propelled either by hand or by motors where the occupant uses electrical controls to manage motors and seating control actuators through a joystick, sip-and-puff control, or other input devices. Often there are handles behind the seat for someone else to do the pushing or input devices for caregivers. Wheelchairs are used by people for whom walking is difficult or impossible due to illness, injury, or disability. People with both sitting and walking disability often need to use a wheelchair or walker.

Transfer devices

Patient transfer devices generally allow patients with impaired mobility to be moved by caregivers between beds, wheelchairs, commodes, toilets, chairs, stretchers, shower benches, automobiles, swimming pools, and other patient support systems (i.e., radiology, surgical, or examining tables). The most common devices are Patient lifts (for vertical transfer), Transfer benches, stretcher or convertible chairs (for lateral, supine transfer), sit-to-stand lifts (for moving patients from one seated position to another i.e., from wheelchairs to commodes), air bearing inflatable mattresses (for supine transfer i.e., transfer from a gurney to an operating room table), and sliding boards (usually used for transfer from a bed to a wheelchair). Highly dependent patients who cannot assist their caregiver in moving them often require a Patient lift (a floor or ceiling-suspended sling lift) which though invented in 1955 and in common use since the early 1960's is still considered the state-of-the-art transfer device by OSHA and the American Nursing Association.

Walker- A walker or walking frame or Rollator is a tool for disabled people who need additional support to maintain balance or stability while walking. It consists of a frame that is about waist high, approximately twelve inches deep and slightly wider than the user. Walkers are also available in other sizes, such as for children, or for heavy people. Modern walkers are height-adjustable. The front two legs of the walker may or may not have wheels attached depending on the strength and abilities of the person using it. It is also common to see caster wheels or glides on the back legs of a walker with wheels on the front.[3]

Prosthesis

A **prosthesis, prosthetic**, or **prosthetic limb** is a device that replaces a missing body part. It is part of the field of biomechatronics, the science of using mechanical devices with human muscle, skeleton, and nervous systems to assist or enhance motor control lost by trauma, disease, or defect. Prostheses are typically used to replace parts lost by injury (traumatic) or missing from birth (congenital) or to supplement defective body parts. Inside the body, artificial heart valves are in common use with artificial hearts and lungsseeing less common use but under active technology development. Other medical devices and aids that can be considered prosthetics include hearing aids, artificial eyes, palatal obturator, gastric bands, and dentures.

Prostheses are specifically *not* orthoses, although given certain circumstances a prosthesis might end up performing some or all of the same functionary benefits as an orthosis. Prostheses are technically the complete finished item. For instance, a C-Leg knee alone is *not* a prosthesis, but only a prosthetic *component*. The complete prosthesis would consist of the attachment system to the residual limb — usually a "socket", and all the attachment hardware components all the way down to and including the terminal device. Keep this in mind as nomenclature is often interchanged.

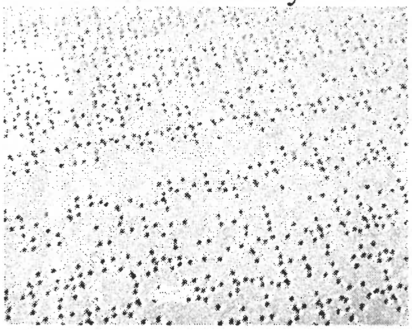
The terms "prosthetic" and "orthotic" are adjectives used to describe devices such as a prosthetic knee. The terms "prosthetics" and "orthotics" are used to describe the respective allied health fields. The devices themselves are properly referred to as "prostheses" and "orthoses" in the plural and "prosthesis" and "orthosis" in the singular.

Visual impairments

Many people with serious visual impairments live independently, using a wide range of tools and techniques. Examples of assistive technology for visually impairment include screen readers, screen magnifiers, Braille embossers, desktop video magnifiers, and voice recorders.

Screen readers

Screen readers allow the visually impaired to easily access electronic information. These software programs connect to a computer to read the text displayed out loud. There is a variety of platforms and applications available for a variety of costs.



Braille is a system of raised dots representing letters, numbers, punctuation, and words.

Braille and braille embossers

Braille is a system of raised dots formed into units called braille cells. A full braille cell is made up of six dots, with two parallel rows of three dots, but other combinations and quantities of dots represent other letters, numbers, punctuation marks, or words. People can then use their fingers to read the code of raised dots.

A braille embosser is, simply put, a printer for braille. Instead of a standard printer adding ink onto a page, the braille embosser imprints the raised dots of braille onto a page. Some braille embossers combine both braille and ink so the documents can be read with either sight or touch.

Desktop video magnifier

Desktop video magnifiers are electronic devices that use a camera and a display screen to perform digital magnification of printed materials. They enlarge printed pages for those with low vision. A camera connects to a monitor that displays real time images, and the user can control settings such as magnification, focus, contrast, underlining, highlighting, and other screen preferences. They come in a variety of sizes and styles; some are small and portable with handheld cameras, while others are much larger and mounted on a fixed stand.

Screen magnification software

A screen magnifier is software that interfaces with a computer's graphical output to present enlarged screen content. It allows users to enlarge the texts and graphics on their computer screens for easier viewing. Similar to desktop video magnifiers, this technology assists people with low vision. After the user loads the software into their computer's memory, it serves as a kind of "computer magnifying glass." Wherever the computer cursor moves, it enlarges the area around it. This allows greater computer accessibility for a wide range of visual abilities.

Personal emergency response systems

This voter with a manual dexteritydisability is making choices on atouchscreen with a head dauber

Personal emergency response systems (PERS), or Telecare (UK term), are a particular sort of assistive technology that use electronic sensors connected to an alarm system to help caregivers manage risk and help vulnerable people stay independent at home longer. An example would be the systems being put in place for senior people such as fall detectors, thermometers (for hypothermia risk), flooding and unlit gas sensors (for people with mild dementia). Notably, these alerts can be customized to the particular person's risks. When the alert is triggered, a message is sent to a caregiver or contact center who can respond appropriately.

Accessibility software[edit]

Main article: Computer accessibility

In human–computer interaction, computer accessibility (also known as accessible computing) refers to the accessibility of a computer system to all people, regardless of disability or severity of impairment, examples include web accessibility guidelines.[4] Another approach is for the user to present a token to the computer terminal, such as a smart card, that has configuration information to adjust the computer speed, text size, etc. to their particular needs. This is useful where users want to access public computer based terminals in Libraries, ATM, Information kiosks etc. The concept is encompassed by the CEN EN 1332-4 Identification Card Systems - Man-Machine Interface.[5] This development of this standard has been supported in Europe by SNAPI and has been successfully incorporated into the Lasseo specifications, but with limited success due to the lack of interest from public computer terminal suppliers.

Hearing impairments[edit]

Main article: Assistive Technology for Deaf and Hard of Hearing

The deaf or hard of hearing community has a difficult time to communicate and perceive information as compared to hearing individuals. Thus, these individuals often rely on visual and tactile mediums for receiving and communicating information. The use of assistive technology and devices provides this community with various solutions to their problems by providing higher sound (for those who are hard of hearing), tactile feedback, visual cues and improved technology access. Individuals who are deaf or hard of hearing utilize a variety of assistive technologies that provide them with improved accessibility to information in numerous environments.[6] Most devices either provide amplified sound or alternate ways to access information through vision and/or vibration. These technologies can be grouped into three general categories: Hearing Technology, alerting devices, and communication support.

Hearing aids[edit]

Main article: Hearing aid

A hearing aid or deaf aid is an electroacoustic device which is designed to amplify sound for the wearer, usually with the aim of making speech more intelligible, and to correct impaired hearing as measured by audiometry. This type of assistive technology helps people with hearing loss participate more fully in their communities by allowing them to hear more clearly. They amplify any and all sound waves through use of a microphone, amplifier, and speaker. There is a wide variety of hearing aids available, including digital, in-the-ear, in-the-canal, behind-the-ear, and on-the-body aids.

Assistive listening devices[edit]

Main article: Assistive listening device

Assistive listening devices include FM, infrared, and loop assistive listening devices. This type of technology allows people with hearing difficulties to focus on a speaker or subject by getting rid of extra background noises and distractions, making places like auditoriums, classrooms, and meetings much easier to participate in. The assistive listening device usually uses a microphone to capture an audio source near to its origin and broadcast it wirelessly over an FM (Frequency Modulation) transmission, IR (Infra Red) transmission, IL (Induction Loop) transmission, or other transmission method. The person who is listening may use an FM/IR/IL Receiver to tune into the signal and listen at his/her preferred volume.

Amplified telephone equipment[edit]

Main article: Telecommunications device for the deaf#Other devices for the deaf or hard of hearing

This type of assistive technology allows users to amplify the volume and clarity of their phone calls so that they can easily partake in this medium of communication. There are also options to adjust the frequency and tone of a call to suit their individual hearing needs. Additionally, there is a wide variety of amplified telephones to choose from, with different degrees of amplification. For example, a phone with 26 to 40 decibel is generally sufficient for mild hearing loss, while a phone with 71 to 90 decibel is better for more severe hearing loss.[7]

Augmentative and alternative communication[edit]

Main article: Augmentative and alternative communication

An AAC user uses number coding on an eye gaze communication board

Augmentative and alternative communication (AAC) is an umbrella term that encompasses methods of communication for those with impairments or restrictions on the production or comprehension of spoken or written language.[8] AAC systems are extremely diverse and depend on the capabilities of the user. They may be as basic as pictures on a board that are used to request food, drink, or other care; or they can be advanced speech generating devices, based on speech synthesis, that are capable of storing hundreds of phrases and words.[9]

Cognitive impairments[edit]

Main article: Cognitive orthotics

Assistive technology for cognition (ATC)[10] is the use of technology (usually high tech) to augment and assistive cognitive processes such as attention, memory, self-regulation, navigation, emotion recognition and management, planning, and sequencing activity. Systematic reviews of the field have found that the number of ATC are growing rapidly, but have focused on memory and planning, that there is emerging evidence for efficacy, that a lot of scope exists to develop new ATC.[11] Examples of ATC include: NeuroPage which prompts users about meetings,[12] Wakamaru, which provides companionship and reminds users to take medicine and calls for help if something is wrong, and telephone Reassurance systems.[13]

Memory aids[edit]

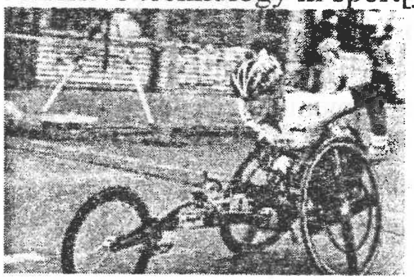
Memory aids are any type of assistive technology that helps a user learn and remember certain information. Many memory aids are used for cognitive impairments such as reading, writing, or organizational difficulties. For example, a Smartpen records handwritten notes by creating both a digital copy and an audio recording of the text. Users simply tap certain parts of their notes and the pen saves it and reads it back to them. From there, the user can also download their notes onto a computer for increased accessibility. Digital voice recorders are also used to record "in the moment" information for fast and easy recall at a later time.[14]

Educational software[edit]

Main article: Educational software

Educational software is software that assists people with reading, learning, comprehension, and organizational difficulties. Any accommodation software such as text readers, notetakers, text enlargers, organization tools, word predictions, and talking word processors falls under the category of educational software.

Assistive technology in sport[edit]



A New York City Marathoncompetitor uses a racing wheelchairAssistive technology in sport is an area of technology design that is growing. Assistive technology is the array of new devices created to enable sports enthusiasts who have disabilities to play. Assistive technology may be used in adaptive sports, where an existing sport is modified to enable players with a disability to participate; or, assistive technology may be used to invent completely new sports with athletes with disabilities exclusively in mind.

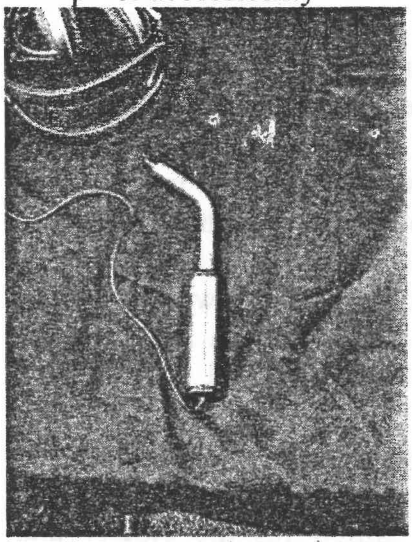
An increasing number of people with disabilities are participating in sports, leading to the development of new assistive technology.[15]Assistive technology devices casimple, or "low-tech", or they may use highly advanced technology, with some even using computers. Assistive technology for sports may also be simple, or advanced.[16] Accordingly, assistive technology can be found in sports ranging from local community recreation to the elite Paralympic Games. More complex assistive technology devices have been developed over time, and as a result, sports for people with disabilities "have changed from being a clinical therapeutic tool to an increasingly competition-oriented activity".[17]

Assistive technology in education[edit]

In the United States there are two major pieces of legislation that govern the use of assistive technology within the school system. The first is Section 504 of the Rehabilitation Act of 1973 and the second being the Individuals with Disabilities Education Act (IDEA) which was first enacted in 1975 under the name The Education for All Handicapped Children Act. In 2004, during the reauthorization period for IDEA, the National Instructional Material Access Center (NIMAC) was created which provided a repository of accessible text including publisher's textbooks to students with a qualifying disability. Files provided are in XML format and used as a starting platform for braille readers, screen readers, and other digital text software.[18] IDEA defines assistive technology as follows: "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability. (B) Exception.--The term does not include a medical device that is surgically implanted, or the replacement of such device." [19]

Assistive technology in this area is broken down into low, mid, and high tech categories. Low tech encompasses equipment that is often low cost and does not include batteries or requires charging. Examples include adapted paper and pencil grips for writing or masks and color overlays for reading. Mid tech supports used in the school setting include the use of handheld spelling dictionaries and portable word processors used to keyboard writing. High tech supports involve the use of tablet devices and computers with accompanying software. Software supports for writing include the use of auditory feedback while keyboarding, word prediction for spelling, and speech to text. Supports for reading include the use of text to speech (TTS) software and font modification via access to digital text. Limited supports are available for math instruction and mostly consist of grid based software to allow younger students to keyboard equations and auditory feedback of more complex equations using MathML and Daisy.

Computer accessibility



A sip-and-puff device which allows a person with substantial disability to make selections and navigate computerized interfaces by controlling inhalations and exhalations

One of the largest problems that affect people with disabilities is discomfort with prostheses.[20] An experiment performed in Massachusetts utilized 20 people with various sensors attached to their arms.[20] The subjects tried different arm exercises, and the sensors recorded their movements. All of the data helped engineers develop new engineering concepts for prosthetics.[20]

Assistive technology may attempt to improve the ergonomics of the devices themselves such as Dvorak and other alternative keyboard layouts, which offer more ergonomic layouts of the keys.[21][22] Assistive technology devices have been created to enable people with disabilities to use modern touch screen mobile computers such as the iPad, iPhone and iPod touch. The Pererro is a plug and play adapter for iOS devices which uses the built in Apple VoiceOver feature in combination with a basic switch. This brings touch screen technology to those who were previously unable to use it. Apple, with the release of iOS 7 had introduced the ability to navigate apps using switch control. Switch access could be activated either through an external bluetooth connected switch, single touch of the screen, or use of right and left head turns using the device's camera. Additional accessibility features include the use of Assistive Touch which allows a user to access multi-touch gestures through pre-programmed onscreen buttons.

For users with physical disabilities a large variety of switches are available and customizable to the user's needs varying in size, shape, or amount of pressure required for activation. Switch access may be placed near any area of the body which has consistent and reliable mobility and less subject to fatigue. Common sites include the hands, head, and feet. Eye gaze and head mouse systems can also be used as an alternative mouse navigation. A user may utilize single or multiple switch sites and the process often involves a scanning through items on a screen and activating the switch once the desired object is highlighted.

Home automation[edit]

The form of home automation called assistive domotics focuses on making it possible for elderly and disabled people to live independently. Home automation is becoming a viable option for the elderly and disabled who would prefer to stay in their own homes rather than move to a healthcare facility. This field uses much of the same technology and equipment as home automation for security, entertainment, and energy conservation but tailors it towards elderly and disabled users. For example, automated prompts and reminders utilize motion sensors and pre-recorded audio messages; an automated prompt in the kitchen may remind the resident to turn off the oven, and one by the front door may remind the resident to lock the door.[23]

Impacts of assistive technology[edit]

Overall, assistive technology aims to allow people with disabilities to "participate more fully in all aspects of life (home, school, and community)" and increases their opportunities for "education, social interactions, and potential for meaningful employment."[24] It creates greater independence and control for disabled individuals. For example, in one study of 1,342 infants, toddlers and preschoolers, all with some kind of developmental, physical, sensory, or cognitive disability, the use of assistive technology created improvements in child development. These included improvements in "cognitive, social, communication, literacy, motor, adaptive, and increases in engagement in learning activities.

CHECK YOUR PROGRESS

1. What criteria should be taken into consideration to design activities for the following

   (m) Reading skills in HI children

   (n) Mathematics skills in MR children

   (o) Vocational skills in Locomotor impaired

   (p) Writing skills in VI children

2. You are interested to design a curriculum for MR children. What should be the basis of curriculum design.

SUGGESTED ASSIGNMENTS

1. Plan a programme to develop social skills in a pre-adolescent group of children with disabilities.
2. Plan activities to develop skills in mobility and ADL for children with Orthopedic Disabilities and Visual Impairment.
3. Plan pre –vocational programme for children with M.R and V.I.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through this Unit you might like to have further discussion on some points and clarification on others

Points for discussion

Points for clarification

FURTHER READINGS

1. Carol Carter, Joyce Biswhop Keys to Success. How to Achieve your
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2. Krishna Kumar (1986) The child's Language and
The Teacher -
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3. Lyndon W Searfoss Helping Children Learn To
Read.
John E. Readence (1994) Pub. Allyn and Bacon MA
02 1944.

4. NIMH Sewnderabad (1989) Hand Book For The
Trainers of the
Mentally Retarded Persons.
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5. Paul A Albeoto Applied Behaviour
Analysis For Teacher
Anne C Troutman (1990) Merrill Pub. Co. ohio
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BLOCK 5 : DEAF-BLINDNESS

UNIT – 1 : DEFINITION, CAUSES, CLASSIFICATION, PREVALENCE AND CHARACTERISTICS OF DEAF-BLINDNESS

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Deafblindness is the combination of significant auditory and visual impairments in a person. These dual sensory losses vary in severity from person to person and do not necessarily lead to total deafness and/or total blindness. It is entirely possible that the person will retain some useful vision and hearing. However, in combination, these impairments of the distant senses causes serious developmental delays in the child, affecting cognitive development, social development, acquisition of communication and language skills, orientation and mobility. A combination of visual and hearing impairment causes such severe developmental, communication and learning needs that the person cannot be educated in special education programs meant for the hearing impaired, for the visually impaired or for severe disabilities. Supplementary assistance would be required to address their unique educational needs consequential to the concurrent impairments of vision and hearing. Deafblindness leads to a severe disabling condition caused by combined losses in hearing and vision. A deafblind child cannot be thought of as blind and also deaf, nor as deaf and also blind. Various terms have been used in the past to refer to this heterogeneous group of population. Earlier, the term 'deaf blind' or 'deaf-blind' was used. However, keeping with the belief that impairments in both hearing and vision have, not an additive, but a multiplicative effect on the affected Chapter 1 Concept and Meaning of Deafblindness individual, the term 'deafblind' is now used (Aitken, 2000). Deafblindness is a unique disability; it has its own concepts and terminology, its own methods of assessment and means of education, and its own modes of communication, which distinguishes "deafblindness" from deafness and blindness. Deafblindness is not a medical concept, surprisingly; medical literature makes few references to deafblindness. It is a developmental concept which helps us to understand the nature and the extent of a disability consequent to deafblindness. Because 95 percent of what we learn comes through our eyes and ears, deafblindness leads to difficulties in communication, mobility, and in accessing information.

Deafblind people fall into four groups:

1. Those who are born deaf and blind, which can happen if the mother, inter alia, contacted Rubella (German Measles) during pregnancy.
2. Those who were born deaf and then lost their sight. This is often caused by the Usher Syndrome – deafness followed by a decrease in sight because of retinitis pigmentosa (tunnel vision).
3. Those who were born blind and then lost their hearing.
4. The adventitious deafblind, as a result of old age, or through an illness or accident later in life.

OBJECTIVES

Deafblindness and Communication Quite a few deafblind people still have a little useful sight and hearing, which can be improved by wearing glasses and/or through hearing aid usage. However, conditions such as excessive background noise, poor illumination, depriving utility of visual cues, insufficient knowledge in hearing aid usage, poor initial selection of the instrument may limit the utility derived from wearing hearing aids.

DEFINITIONS

Deafblind people who were born deaf or went deaf in early years may depend on Sign Language, rather than spoken language. Those who have some remaining sight may still be able to see Sign Language at close quarters. If they can't, they may place their hands on the hands of the person signing to them to help recognise the signs through touch. Other deafblind people who have either very limited or no sight or hearing at all, need the speaker to communicate with them on the palm of their hand. One-way is to trace out the letters of each word in block capitals, one on top of the other. This is simple but the drawback is that it is slow and also a person who has been blind all his/ her life may not easily recognise the letters as they are more used to reading Braille.

Figure 1: Sign Language

A quicker method is called 'Deafblind manual alphabets' and is like the finger spelling used in Sign Language, but placed on the hand. Different letters are spelt out by touching specific areas of the fingertips and palm of the deafblind person. For example "A" is made by touching the person's thumb. Deafblind manual can be learnt quickly. With practice, it may be possible to have a conversation at a reasonable pace by using this type of finger spelling. Sadly, many people don't learn this easy method of communication. If they meet a deafblind person who uses it, there may be a total breakdown of communication, which is frustrating and embarrassing for those involved. Deafblindness and Mobility Finding one's way from one place to another is difficult enough for someone with little or no sight, but it can get so much worse when the person has little or no hearing to help them find their way. Crossing a road when you can neither clearly hear nor see the traffic is extremely dangerous. The problem is made worse by the poor balance that many deafblind people have who find difficulty in walking without someone beside them to help. Whereas blind people use a white cane to show they have a problem with their sight, deafblind Figure 1: Sign Language people use the same white cane but with red bands Quick signs: For 'YES' two taps on the palm of the hand. For 'NO' or for erasing an error, a rubbing out movement across the palm. 69 around it, which shows that they have a loss, of hearing as well as sight. Deafblindness and Accessing Information A lot of important information appears in small print posing difficulties to the deafblind. For those who have some sight left may need much larger print to be able to read. Others may need it in tactile form such as Braille or Moon which they can 'read' with their fingertips. Those who have adequate hearing, may require audiocassette or compact disks. Definition of Deafblindness "Deafblindness is the condition of having little or no useful sight and hearing. As with the word 'deaf ', it can be capitalized to indicate that it is a culture; some prefer the spelling 'Deafblind'. The most well known deafblind person is the author, activist and lecturer Helen Keller." Deaf-blind people have an experience quite distinct from people who are only deaf or blind and not both. Federal Definition of Deafblindness – USA "Concomitant hearing and visual impairments, the combination that creates such severe communication and other developmental and educational needs that they cannot be accommodated in special education in programs solely for children with deafness or children with blindness." FR Dept. of Education, 34 CFR Parts 300 & 303, Vol. 64, No. 48.3/12/99 Defining the term 'Deafblind' "Deafblindness" is a condition presenting other difficulties than those caused by deafness and blindness. It is an "umbrella" term, which can include both children and adults who are: • Blind and profoundly deaf. • Blind and severely or partially hearing impaired. • Partially sighted and profoundly deaf. • Partially sighted and severely or partially hearing impaired. "The term, 'children with deafblindness', means children and youth having auditory and visual impairments, the combination of which creates such severe communication and other developmental and learning needs that they cannot be appropriately educated without special education and related services, beyond those that would be provided solely for children with hearing impairments, visual impairments, or severe disabilities to address their educational needs due to these concurrent disabilities." There is not yet one generally agreed definition of deafblindness, but most of the definitions include the following characteristics in the deafblind: • Simultaneous presence of defective vision and hearing impairment which may vary in degrees. • Does not imply total loss of either vision or hearing. • Communication is most severely affected. • Highly individualized training is needed to cope with the condition. • The world is much narrower as the distant senses are affected, and it is usually within the arm's reach. • Affects person in totality. • Associated medical conditions with hearing and visual loss may be present. 70 Description of Deafblindness The term 'Deafblind' is used to describe a "heterogeneous group of (people) who may suffer from varying degrees of visual and hearing impairment, perhaps combined with learning and physical disabilities, which can cause severe communication, developmental and educational problems". {Department of Education Services (DES) Policy Statement (March 1989)} Source: Quality Standards in Education Support Services for Children and Young People who are Deafblind/ Multi-Sensory-Impaired, Sense, UK, page 5. A precise description is difficult because the degree of deafness and blindness, possibly combined with varying degrees of other disabilities, are not uniform, and the educational needs of each (person) will have to be decided individually. In functional terms these children and young people may include those with: • Moderate to profound auditory and significant visual impairment. • Moderate to profound auditory and significant visual impairments and other significant disabilities. • Central processing problem of vision and hearing. • Progressive sensory impairment. • A significant visual impairment; and a possible loss of auditory processing mechanisms (associated with severe physical disabilities or severe cognitive disabilities) and severe communication delay.

UNIT SUMMARY

I n India, disability sometimes is referred to as the "result of wrong doings in the past life". This myth is abating due to the awareness created by various Government and Non-Government organisations. The cause for multi-sensory impairment and deafblindness is more or less similar to the causes for single category disability. Some of the most common causes of deafblindness are Usher's Syndrome, Congenital Rubella Syndrome, CHARGE Association and Old Age. Other causes are severe head injuries; traumas; sexually transmitted diseases, such as syphilis and AIDS; drug overdosing; medical errors and self inflicted injuries. Four primary causes of vision and hearing loss: • Hereditary/Chromosomal Disorders. • Prenatal viral/bacterial diseases, or harmful chemicals (Teratogens). • Complications at birth. • Postnatal injuries and/or illnesses. Deafblindness is not caused by a single condition. People can be born deafblind, possibly as a result of infection, a genetic syndrome or birth trauma. This may result in congenital deafblindness. Acquired deafblindness refers to instances where a person becomes deafblind later in life, as a result of a progressive condition or through infection, accident or due to the process of ageing. The main cause of deafblindness in children in the developing countries is rubella contracted by the pregnant mother. Other causes include premature birth, birth trauma and various syndromes. These are discussed below. Genetic Conditions A number of genetic conditions can give rise to deafblindness. Usher's syndrome, for example, is caused due to a gene irregularity, present from birth with effects appearing gradually over the years. Hearing impairment is usually present from birth or soon after and can range from moderate to profound. Visual impairment is progressive and can occur in late childhood to early adolescence. How much sight will be lost cannot be predicted. Infections Rubella contacted during pregnancy used to be a major cause of deafblindness before the introduction of vaccination programs in developed countries but it is still a major cause in developing countries. Other infections, affecting the foetus, include cytomegalovirus (CMV) or toxoplasmosis. Meningitis is an example of an infection, which can cause impairments at any time in life, depending on the strain and severity of the infection. Some particular types of meningitis affect young babies more than other age groups. 74 Rubella and Congenital Rubella Syndrome Rubella, a childhood disease, caused by a virus, may be transmitted from person to person as droplets in air through coughing and sneezing or through close contact. A person with rubella is a carrier of the infection for about two weeks, or occasionally little longer, before the rash appears. However, an affected person may be unaware that he is infected and feel perfectly well and may not even develop a rash. If someone has been in contact with an infected person, there may be an incubatory period of two to three weeks, before the infection becomes manifested. An infected person may feel generally unwell for a few days, perhaps have swollen glands, a slight temperature, or a sore throat, and may get a rash which starts around the face and can spread to lower parts of the body and the limbs. Some people, particularly women, may experience pain or discomfort in their joints. Other people may be carriers, but show no signs or symptoms of having rubella. A woman who contracts rubella in pregnancy does not always pass it on to the foetus; the earlier in her pregnancy she has the infection, the more likely the transmission and a consequential, identifiable damage. Contact up to the 18th week of pregnancy is particularly serious. The pathway of the virus is through the maternal blood stream to the placenta and to the foetus. If transmission does occur, then it will happen just before or around the time that the woman gets the rubella rash. Occasionally, rubella in pregnancy can result in miscarriages or stillbirths. Babies with congenital rubella have the virus circulating in their bodies for much longer than adults or children with the acquired infection. Thus a congenitally affected baby can remain a carrier for six months to a year, or occasionally even longer. Damage or disability unrelated to rubella is always possible. Rubella may damage the eye, resulting in cataract (opaqueness of the lens) a typical signs of congenital rubella. One eye may escape harm or both may be affected. Sometimes microphthalmos (abnormally small eye or eyes) may be present as well. Pigmentary retinopathy (speckled colouring of the retina) is very common in children with congenital rubella, but does not affect the sight. Hearing loss, which may be conductive or sensorneural, is one of the commonest results of congenital rubella and may often appear as the only defect. The organ of Corti, a part of the inner ear is often the part that is damaged by rubella. Hearing loss may be mild or severe, unilateral or bilateral and may be progressive. Heart abnormalities are sometimes seen in babies with congenital rubella and may include failure of the duct between the pulmonary artery and aorta to close (patent ductus arteriosus); opening(s) in the dividing wall between left and right ventricles (ventricular septal defect), or other heart defects. Many rubella babies are underdeveloped in the womb. Perhaps the infected placenta is not able to function fully, affecting nutritional supply to the foetus. The rubella virus may also be directly responsible for slowing down the foetal rate of growth. The rubella virus may also cause mild to severe neurological problems. Learning disabilities, mental retardation and seizures may also occur. Congenital rubella can affect people in different ways: some may develop problems later in life, including deterioration of hearing and vision and endocrine dysfunction. People with congenital rubella should undergo regular health check-ups, including vision and hearing assessments throughout their lives. According to World Health 75 Organisation weekly Epidemiological Record, No. 20, May 19, 2000, 75, 161-177 there is an estimation that more than 100,000 CRS cases occur in the developing countries alone. Congenital rubella is preventable with the rubella vaccine, available as a single vaccine or the combined measles, mumps and rubella (MMR) vaccine. Mass vaccination programs are being implemented in many countries. Cytomegalovirus Cytomegalovirus or CMV is a potential prenatal cause of deafblindness. In the UK Census Head Office, database records 7 people Deafblind through CMV compared to at least 280 Deafblind through rubella (Deafblind International Review, July–December 1995). Cytomegalovirus means a large cell, a commonly occurring virus belonging to the herpes virus group, which includes chicken pox, cold sore and glandular fever viruses. The infection may pass unnoticed or there may be mild flu-like symptoms in the pregnant mother. Once infected, the virus remains dormant. The virus can become active again at intervals. The virus is spread through saliva, urine and other body fluids. CMV is very difficult to avoid. It may be caught from someone who shows no signs of being ill. CMV, like the rubella virus, can cross the placenta and affect the developing foetus. If CMV infects a pregnant woman, the foetus may be damaged. Only 10% of the affected babies may display symptoms and in only half of these children the disability will be serious. It is only the first or primary infection during pregnancy, which can cause problems. It is very rare that reactivation of CMV during pregnancy damages the foetus. Problems resulting from congenital cytomegalovirus infection vary, but may include jaundice, bloodspots on the skin, enlargement of the liver or spleen, spasticity (disordered control of movement), intracranial and other calcifications (the deposition of calcium within organic tissue), mental retardation and seizures. In some cases, hearing impairment may be the only sign of the CMV infection while others may have severe sight problems as well. Most children with congenital CMV are healthy and if not tested at birth will go undetected. It is not known why some are affected and others are not. Pre-natal diagnosis is not possible as at present there are no tests available or a vaccine. Estimates suggest that of 600,000 babies born in England and Wales perhaps 2,000 will have congenital Cytomegalovirus and of these about 200 have sensory problems as a result (Deafblind International Review, July–December 1995). Toxoplasmosis Toxoplasmosis is caused by a parasite called toxoplasma gondii. It forms cysts (hard-walled microscopic forms), which are passed in the faeces of its primary or main host, the cat which contaminate gardens and vegetables in their wanderings. Even though they bury their faeces, one can still come into contact with them, resulting in their eating the cystic form of toxoplasmosis. Toxoplasmosis can affect almost all animals, including humans. Most animals carry it. Undercooked meat and the increasing consumption of unpasteurised goat's milk are two other potential causes. Luckily the resulting infection is usually very mild, it can be a glandular-like illness or produce symptoms of a mild flu. However, in a pregnant woman, the infection, though not afflicting her, can cause congenital abnormality in the unborn baby up to 40% of the cases. Of these, 10 per cent are likely to be seriously affected (Deafblind International Review, Jan.–June 1997). If the disease is caught early in pregnancy, it is less likely to cross the placenta. If it does, the consequences are more serious. If the pregnant 76 woman catches the infection later, it is more likely to cross the placenta but the effects on the foetus are less severe. Babies born with toxoplasmosis (usually when infected between the third and sixth month) may develop severe symptoms such as hydrocephalus, calcification in the brain and chorioretinitis (damage to the retina). Epilepsy and deafness can also result. Most worrying in this regard is the delayed manifestation of the eye disease up to the late teens. The Public Health Laboratory in Swansea, UK, estimated in 1988 a rate of infection of two per 1,000 pregnant women. If the French figures of 40% of mothers passing infection to their babies are the same in the United Kingdom, it could mean that about 480 babies a year are affected in the UK (Deafblind International Review, Jan.–June 1997). Most adults recover spontaneously from toxoplasmosis without any treatment, although it is possible to treat the condition using sulpha drugs. Eye treatment of toxoplasmosis infections is more complicated, and pregnant women must be given a different drug since the usual one is too toxic. No treatment manages to eradicate all cysts. This means that an infection, which may appear to have been cured, can recur later. Birth Trauma Visual and hearing impairments can arise as a result of problems at birth or soon after. Such children may have additional, impairments such as severe physical defects, learning disabilities and communication problems. Accidents or Other Trauma Any accident involving head injury can damage the parts of the brain that deal with processing information through sight and hearing. They can also damage parts of the auditory system. The injury can have many different effects that are difficult to understand. Other kinds of trauma, for instance, a stroke (a cerebral haemorrhage) can result in deafblindness. Age-related Causes The most common cause of deafblindness is simply aging. After the age of around 50 years; hearing and visual impairments become more common leading to senile deafblindness.

CHECK YOUR PROGRESS

1.(a) Write the full form of

(1)CBM

(2)UNESCO

(3)NCERT

(4)UNICEF

(5)NAB

(6)NIMH

(7)NIVH

(8)BPA

(9)AYJNIHH

(10)NIOH

(b) Classify the above as national, international and non government agencies

2.Write the role of any national agency working for education of disable children.

ASSIGNMENT /ACTIVITY

1. **Draw the comparison between the government and the NGOs about their programme goals, methodologies and outcomes.**
2. Cooperation and partnership of the various government, non-government and inter agencies are essential for the programmes for the disabled Justify the Statement.

POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification on other. Note down those points below:

Points for Discussion

1.10.2 Points for Clarification

REFERENCES /FURTHER READING

1. Status of Disability in India – 2000, RCI, New Delhi

2. Beroz Vacha (2000), Key Note Speech, Deaf Blind International, Asian Conference.

3. Education and rehabilitation of the visually Impaired, NAB India, H.K. Printers, Bombay.

UNIT – 2 : EFFECTS AND IMPLICATIONS OF DEAF-BLINDNESS ON ACTIVITIES OF DAILY LIVING & EDUCATION

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

Deafblindness is a unique disability- a combination of visual and hearing impairment. Though the degree of deafness or blindness varies, the combination of dual sensory loss leads to unique problems in an individual's communication, mobility and their ability to access information. Because 95% of what we learn about the world comes through sight and hearing, deafblind children face unique challenges in communication, mobility and accessing information; making deafblindness one of the most isolating disabilities. Deafblindness is a low incidence disability and is hidden in community. There is no data available regarding the size of the deafblind population in India as, to date there has been no comprehensive study or research to determine the true incidence. Estimates, based on information gathered from community based projects, indicate that there could be more than 450,000 deafblind/ multiple disabled people in the country

OBJECTIVES

DEFINITIONS

Deafblindness is "A combination of hearing and visual impairments causing such severe communication, developmental and educational problems that the child cannot be accommodated in either a programme specifically for the deaf or a programme specifically for the blind."{The Education for All Handicapped Children Act (P.L. 94-142) of 1975 and the Individuals with Disabilities Education Act (IDEA) (P. L.101-476} You would have noticed that the definitions speak about: ı Combination of vision and hearing impairment ı Does not imply total vision or hearing loss ı Communication is most severely affected ı Highly individualised training ı The world is much narrower ı Affects person in totality ı Associated medical conditions In India there are an estimated 450,000 deafblind people. Section 2: Multi-sensory Impairment People whose combined sight and hearing impairment cause difficulties with communication, access to information and mobility can be regarded as deafblind/MultiSensory Impaired (Department of Health). They have varying degrees of visual and hearing impairment, perhaps combined with learning and physical disabilities (Department of Education, 1989).Many of these children will also have a wide range of other disabilities - such as learning difficulties, epilepsy, feeding problems and severe disabilities. Children with multi-sensory impairment have a combination of visual and hearing difficulties. They 6 ı Module on Training of Resource Teachers under SSA on Deafblindness are sometimes referred to as deafblind but may have some residual sight and/or hearing. Many also have additional disabilities but their complex needs mean that it may be difficult to ascertain their intellectual abilities. Children with multi-sensory impairment have much greater difficulties in accessing the curriculum and the environment than those with a single sensory impairment. They have difficulties in perception, communication and in the acquisition of information.

Incidental learning is limited. These children need teaching approaches which make good use of their residual hearing and vision, together with their other senses. They may need alternative means of communication. Section 3: Causes of Deafblindness There is no single medical condition which can lead to the unique disability of Deafblindness. People can be born deafblind or may acquire deafblindness later in life. People born deafblind as a result of infection, genetic syndrome or birth defect are termed as having congenital deafblindness or early onset deafblindness. Those who acquire deafblindness later in life as a result of trauma or accident, genetic syndrome, ageing or progressive infection are termed as having acquired deafblindness. Some of the common causes are: ı Congenital or early onset deafblindness 1. Infections as a cause of deafblindness ı Rubella virus or commonly known as German Measles leading to Congenital Rubella Syndrome (CRS) ı Cytomegalovirus (CMV) or Toxoplasmosis ı Meningitis and Encephalitis 2. Genetic or chromosomal syndromes as cause of deafblindness ı CHARGE syndrome ı Down syndrome ı Goldenhar syndrome 3. Congenital birth trauma as a cause of deafblindness ı Premature birth ı Low birth weight ı Anoxia or lack of oxygen ı Other trauma or birth injury Module on Training of Resource Teachers under SSA on Deafblindness ı 7 ı Acquired deafblindness 1. Genetic syndromes as a cause of deafblindness ı Usher Syndrome 2. Accidents or other trauma as a cause of deafblindness 3. Ageing as a cause of deafblindness Rubella (German Measles) Rubella, also known as German Measles, causes a group of congenital defects known as Congenital Rubella Syndrome (CRS). The disease is easily transmitted from the pregnant mother to the unborn foetus. As in the other prenatal infectious disease, rubella does not usually cause serious symptoms in the affected adult. A pregnant woman who is not immunised normally contracts rubella through the nose and throat. The infection spreads, transmitting the virus to the foetus across the placement barrier. Once the foetus is exposed to the virus, the cells of the developing eyes, ears, CNS, and heart can be damaged. CRS occurs among at least 25 percent of infants born to women who had rubella during the first three months of pregnancy. Infection of a pregnant woman can result in a miscarriage, stillbirth or the birth of an infant with abnormalities which may involve multiple organ systems and can cause microcephaly, mental retardation, cataracts, glaucoma, other eye defects, late onset of diabetes, hypertension, enlarged liver and spleen, dental abnormalities and deafness. Hearing impairment in CRS is typically sensorineural but may include accompanying conductive problems. Other complications may include brain damage, cerebral palsy and learning disabilities. There is no specific treatment for CRS. Certain problems that are common in the newborn period, such as blood and liver abnormalities, usually go away without treatment. Other individual birth defects, such as eye or heart defects, can sometimes be corrected or at least improved with early surgery. Infants with hearing or vision loss benefit from special education programmes that provide early stimulation and build communication and learning skills. All children should be vaccinated as a protection from rubella. The rubella vaccine is part of the MMR (measles, mumps, and rubella) vaccine series given to children beginning at 12 months of age. CHARGE Syndrome CHARGE association (or syndrome) is an acronym referring to children with a specific pattern of birth defects. The acronym is: "C" for Coloboma (cleft or failure of the eyeball to close resulting in abnormalities of retina and optic nerve), "H" for Heart defects, "A" for Atresia of Choanae (blockage of nasal passage), "R" for Retardation of growth and development, "G" for Genitourinary problems and "E" for Ear abnormalities (unusually shaped ears, sensorineural or conductive hearing loss). The incidence of CHARGE is about 1 out of 10,000-12,000 births. It affects males and females of all races equally. 8 i Module on Training of Resource Teachers under SSA on Deafblindness Usher Syndrome Usher Syndrome is a genetic disorder that is characterized by hearing impairment as well as an eye disease called Retinitis Pigmentosa. Most of the children with Usher Syndrome have a hearing impairment at birth. At a later stage vision problems also occur starting with night blindness. Vision gradually degenerates (gets worse) over time. Some of the children may be left with tunnel vision and some may go totally blind. Some people with Usher syndrome also have balance problems. Usher syndrome is the most common condition (aside from aging) that affects both hearing and vision. Section 4: Impact of Deafblindness Communication Communication is the area which is affected the most in deafblind individuals. Deafblindness greatly reduces the interaction level of an individual with his/her environment. As we grow and interact with our environment, there is a development of varied concepts around us that in turn leads to the subsequent learning of skills each time. We rely on the information that we get through our visual channels and from what we gather through hearing. Loss of any one distant sense i.e. vision/hearing will directly affect the communication skills. You would observe following points in an individual with deafblindness: ı Difficulty in communicating or inability to communicate in a meaningful way. Due to limited pathways to explore self in an environment, natural inputs that would help an individual to express himself completely are missing in a deafblind individual. Learning from our natural surrounding and learning the right way to communicate gives meaning to our communication and here sensory input from all the senses play a major role. ı Often, communication attempts are missed or misunderstood because the right method to communicate is unknown due to lack of observation and exposure on the part of deafblind individuals and on the immediate contact or caregivers as well. This leads to development of inappropriate communication skills and maladaptive communicative behaviour of deafblind individual. ı Difficulty in approaching a right communication partner who would understand and relate to the need. ı Poor understanding of world around them. ı Restricted modes to communicate as they are unable to speak read and write. ı They do not have many developed social relationships and therefore remain isolated from the world. Module on Training of Resource Teachers under SSA on Deafblindness ı 9 ı Due to lack of visual and auditory information there is reduced motivation to communicate. Being unable to see and hear and due to missing environmental inputs, there is a void in linking with the formal communication system and therefore only a systematic approach towards teaching communication starting from concrete to abstract facilitates learning process in deafblind individuals. Motor Development and Mobility Children learn about their environment as they move through it. They learn about people, objects, sizes, shapes and distances. For typically developing children the senses of sight and hearing provide the greatest motivation for exploration. Children use their vision and hearing to gather information about their surroundings while growing, to understand their own bodies and their own capabilities of movement. The sight of toys or people and the sounds of voices or objects encourage them to move and discover. As they do so, they gather, recognize, and interpret an amazing array of sensory information. Children with deafblindness get constrained information through sensory system. ı Severe medical problems and/or other handicapping conditions, lead to serious developmental delays affecting motor and mobility problems that affect life expectancy of a child with deafblindness. ı Difficulty in independent exploration and hence getting a control over the environment. ı Due to the limited interaction with the environment, children with deafblindness do not get to explore themselves and in the immediate and surrounding environment. ı Conceptual development and experience of space and direction differ significantly from other children. Socialisation We develop our social relationships by interacting with one another, through different modes of communication. Imagine a world with big void of communication, no one to interact with, and no one to talk to, with restricted pathways towards reaching others. Socialisation is altogether an outcome of communication. An individual with deafblindness has very poor scope of reaching out to others to share his/her needs, events and entertainment. Following pointers will enable you to know more characteristic features related to socialisation: ı Extreme difficulty in establishing and maintaining interpersonal relationships with others. As deafblind children have different ways of communication than other members of society, they face difficulty in initiating and understanding conversations. ı Isolation and Disconnection from society: Due to communication difficulty, deafblind children are isolated within their own community. 10 ı Module on Training of Resource Teachers under SSA on Deafblindness ı Living in a world that may seem alternately coming at them or getting disappeared into the thin air creates a secluded environment. Deafblind children sit at one place and do not get opportunity to participate in day-to-day activities at home due to their limited self exploration of environment around them. ı Social deprivation: Communication, Orientation and Mobility difficulty leads to a confined socialisation, they do not participate in social activities.

Knowing what is happening around and participating accordingly enables the person to be socially active and participate fully. ı Isolation: Deafblind individual may detach from others and avoid social interaction. Due to unique way of communication, deafblind children hesitate in initiating conversation which results into detachment from society. And they also learn to avoid social interaction. Behavioural and Sensory Issues Any behaviour of an individual has a reason behind it. Due to our skills and limitations we acquire certain behavioural patterns that get added to our personality. For example, an individual who recognises his limitations in fluent communication with others would gradually develop a behaviour of remaining quiet in a social gathering, or may adapt to certain behavioural pattern that would stimulate his/her needs towards reaching out to others. We often look out for alternatives to our present and not satisfying conditions. It's an in-built human nature to strive for self-satisfaction that gives pleasure. We adapt to various behaviour patterns to rule out our confusions, our fears and also to add on to our own self with new positive concept. Sensory deprivation in an individual with deafblindness creates a big void in one's life. Due to these deficits in an individual with deafblindness, s/he may acquire behavioural patterns that may not be well understood by others in the society. Some of them are mentioned below: ı Typical self-stimulatory behaviours such as eye poking, body rocking. ı Due to lack of observation and exposure to socially appropriate manner of eating food, child with deafblindness may acquire socially incorrect manner of eating food. ı The child also resists different types of food textures due to hypo/hyper sensitivity towards touch or sounds. ı They may have unusual sleep patterns. ı May exhibit variety of behaviour patterns to express their needs and emotions which may be unacceptable in society. □ Unique needs and learning styles due to sensory deficits. Let's see as a whole, what are the general characteristic features of children and youth with deafblindness. However all individuals with deafblindness may not exhibit all. Module on Training of Resource Teachers under SSA on Deafblindness ı 11 ı A distorted perception of the world due to lack of direct information from the distance senses. ı Difficulty in generalizing learnt information to other settings. ı Deprived of many of the most basic extrinsic motivations such as curiosity. ı Lacks the ability to anticipate events. ı Lack observational learning. ı Unable to take advantage from group instruction Education and Learning As mentioned earlier that 95% of whatever we learn comes through our eyes and ears. Deafblind children, therefore, face major challenges in learning. Due to limited vision and hearing these children face problems in communication, mobility and activities of daily living. Deafblindness causes such severe communication and other developmental and learning needs that the persons cannot be appropriately educated in special education programmes solely for children and youth with hearing impairments, visual impairments or severe disabilities, without supplementary assistance to address their educational needs due to these dual, concurrent disabilities. Deafblind children are educationally isolated because impairments of sight and hearing require attentive and unique educational approaches in order to ensure that children with this disability have the opportunity to reach their full potential. For the deafblind child, the world is initially much narrower. If the child is profoundly deaf and totally blind, his or her experience of the world extends only as far as the fingertips can reach. Their concept of the world depends upon what they have had the opportunity to physically come in contact with. If a deafblind child has some useable vision/hearing, as many do, her or his world will be enlarged. Many deafblind children have enough vision to be able to move about in their environments, recognize familiar people, see sign language at close distances and read large print. Others have sufficient hearing to recognise familiar sounds, understand some speech or develop speech themselves. Children with intact vision and hearing learn effectively from all they do and from all that happens around them. These learning experiences include a series of day-to-day events happening around the child. Because the senses of vision and hearing help the child to organise the information from the world around him, it is important to consider that the deafblind child does not have access to opportunities that helps in such incidental learning, as sighted and hearing children do have. Deafblind children acquire fragmented and distorted information from their contact with people and environment. A deafblind child will learn to use all the information about the world around him with the use of his tactile, olfactory, kinaesthetic and proprioceptive senses along with whatever residual hearing and 12 ı Module on Training of Resource Teachers under SSA on Deafblindness vision they might be having. And to make this kind of learning it is important for deafblind child to participate actively in the full sequence of the activity. In other words deafblind children will need to experience activities in the real life settings as they are occurring naturally in the environment around them. They will learn best by doing things together. Loss of sight and hearing also makes the child feel very fearful about the physical environment around him. He is not able to judge his own body in the space around him. His awareness about the organisation of the space and his safety concerns are also limited. It is therefore difficult for the child to get interested to move around in his environment independently and this has an unfavourable effect on his learning opportunities. Learning through doing, forms the basis of a strong learning environment for deafblind child. It is evident that the child faces a major obstacle in learning because of the lack of opportunity to access visual and auditory cues from the environment, less able to anticipate events in his immediate environment and limited scope to make choices. To reduce this loss, it is important to develop routines in the life of the deafblind child.

SUMMARY

Children with deafblindness can be identified in many ways ı Contacting village "sarpanch" and going through the village population data at the panchayat office. ı Conducting a door to door survey. ı Conducting screening camps in the villages. ı Contacting Primary Health Care (PHC) Centre doctors. ı Contacting Paediatric clinics. ı Getting information from Government hospitals. ı Information from child guidance centres. ı Survey data from other special schools/other organisations. Tools required to Identify and Prioritise Needs The following tools would be helpful in identification and prioritising the needs of deafblind children ı Survey format ı Screening schedule ı Medical certificate ı Functional assessment format Module on Training of Resource Teachers under SSA on Deafblindness ı 13 Identification Checklists Observe the child in his familiar environment and answer the following questions in YES or NO. Consult with other family members too. If you get consistent and frequent YES answers, on the screening schedule for vision problems then please refer the child/person to an Ophthalmologist/ Eye Specialist. Similarly if you get consistent and frequent YES answers, on the screening schedule for hearing problems then please refer the child/person to ENT/Audiologist for a clinical Hearing testing at the nearest centre. Hearing Impairment 1. Does the child have problems to hear when you speak to him from behind? Yes / No 2. Does the child speak too loudly or too softy? Yes / No 3. The child is not responding while calling by his / her name at a 3-5 feet distance? Yes / No 4. Does the child exhibit voice problem and mispronunciation very often? Yes / No 5. Does the child understand only after few repetitions? Yes / No 6. Does the child answer your questions irrelevantly? Yes / No 7. Does the child favour one each for listening purpose? Yes / No 8. The child responds to the questions through gestures or signs? Yes / No 9. Does the child have problems in play ground while playing within peers? Yes / No 10. The child needs more repetitions in class? Yes / No 11. The child tunes the TV / Radio too loud? Yes / No 12. The child does not respond to the sounds in the classroom? Yes / No 13. Is the child not able to speak properly even simple? Yes / No 14. Does the child keenly observe the facial expressions / lip of you while talking? Yes / No Visual Impairment 1. Does the child have difficulty in counting the finger of an outstretched hand at a distance of one meter? Yes / No 2. Does the child move his / her head towards the source of light? Yes / No 3. Does the child rub his / her eyes frequently? Yes / No 4. The child keeps the book too far / too close to his / her eyes while reading? Yes / No 14 1 Module on Training of Resource Teachers under SSA on Deafblindness 5. Does the child frequently ask other children while taking down the notes from the blackboard? Yes / No 6. Does the child list against objects on the side? Yes / No 7. The child has difficulty in reading from the black board, even if she is sitting in the first row? Yes / No 8. The child is not able to identify / match colours? Yes / No 9. Does the child having abnormal structure of eyes (bulging / too big / too small)? Yes / No 10. Does the child get water frequently from his / her eyes? Yes / No 11. The child has problem in following the moving objects? Yes / No 12. Lighting variations in the environment confuse the child? Yes / No 13. The child blinking eyes very often? Yes / No 14. The child find difficult to identify objects / people at a distance of 4-5 meters or further? Yes / No Section 6: Impact of DB on Learning Refer section 4 Educational Aspect Section 7: Assessment of Deafblind Children Assessment involves gathering of information in many ways, like testing the child directly, observing the child in varied environments as well as interviewing family members and significant others. Assessment is done before implementing the intervention programme. Assessment is the first step that is taken by an educator/ therapist to develop a holistic programme for the child. We assess the child's environment, child's communication, visual and hearing abilities, cognitive abilities, physical difficulties, socialization skills, personal factors like child's likes and dislikes, strengths and areas where development is required. Assessment also includes retrieving information regarding medical and educational history. An assessment is the crucial stage in addressing the particular needs of the individual deafblind person. It provides a foundation on which a plan is made and services provided. Purpose of Assessment Assessment will help the educator, professional and parent: ı To identify the strengths and limitations of the deafblind child. Module on Training of Resource Teachers under SSA on Deafblindness ı 15 ı To know the developmental levels. ı To know various needs like social, environmental, family, medical and communication. ı To know what to teach and the best method to teach. ı To identify appropriate programmes and instructional strategies. ı To classify and place the child in the appropriate programme. ı To provide with the most appropriate amplification, vision and mobility aids and /or other prosthesis. ı To develop an Individual Educational Plan. Areas of Assessment ı Vision ı Do visual fields appear to be intact? ı Does the child look at an object while interacting with it or look away and then act? ı Does the child show colour preferences? Preference for movement rather than still objects? ı Are eyeglasses or low vision aids recommended? Tolerated? In use? ı How does lighting affect him? ı What is the child's preferred learning mode: visual, auditory, or tactual? ı Hearing ı Is the child aware of sound? ı Does s/he alert to sound, orient to sound, localize sound, isolate a specific sound in the presence of other sounds? ı Does the child respond to a selected sound among other sounds? ı Is the child frightened by any sounds? ı Likes and dislikes in sounds? ı Does she understand and respond to routine verbal instructions/commands? ı Does she recognize people by their voice? ı Does the child appear to use hearing aid to respond during the assessment to voice? Music? Speech? 16 ı Module on Training of Resource Teachers under SSA on Deafblindness ı Are hearing aids recommended? Tolerated? In use? ı Social/ Communication domain ı What modes/methods does the child use for receptive and/or expressive communication? ı How does the child use these? ı How does the child respond to the assessment facilitator, parent and peer i.e. cues, verbal requests, pause for turn-taking. □ Who are the child's communication partners? ı How do they communicate with the child? ı What are the child's preferred modes of communication? □ Does he understand objects? ı How does he use them? ı What are his topics for communication? ı Does he initiate interactions/conversations? ı Does he communicate at a pre-intentional or intentional level of communication? ı Does he use gestures or pointing? Does he show anticipation? Tools for Assessment for the Children with Deafblindness 1. Learning through Doing This tool was developed by Blind Peoples Association, Ahmedabad and National Institute for the Visually Handicapped, (NIVH), Dehradun to assess children with multiple disabilities. Many experts from the field have given their contributions to make this tool comprehensive. It was developed in 2002 and is an assessment tool as well as programming manual. It covers areas like: ı Social areas ı Personal care ı Orientation and Mobility ı Functional academics ı Independent living/Vocational skills. Module on Training of Resource Teachers under SSA on Deafblindness ı 17 This tool also focuses upon recreational activities like festivals and animal movies. It also provides information related to assessment format, Individualized Educational Programme planning and periodic evaluation. 2. Screening Checklist for Sensory Impairment This tool was developed by National Institute for the Mentally Handicapped (NIMH), Secunderabad: Department of Special Education, NIMH has developed this checklist under the project 'Development of service models for children with mental retardation and multi sensory impairments'. The checklist contains provision for collecting basic information about the child and record statements in simple observable language indicating probable sensory impairment. This is a screening checklist covering the areas like vision, hearing and behaviour. 3. Callier-Azusa Scale The Callier-Azusa scale is a developmental scale specifically designed to aid in the assessment of deafblind children and children with severe and profound disabilities. It is designed to be particularly comprehensive at lower developmental levels. This scale is not a teaching curriculum; its purpose is to provide the assessment information necessary to synthesize developmentally appropriate skills for a child. This scale can also be used for evaluation purposes. The Callier-Azusa Scale is composed of 18 subscales in five areas- ı Motor development ı Perceptual development ı Daily living skills ı Cognition, communication and language ı Social development. Administration of the scale is based on behaviours which typically occurs in conjunction with classroom activities. This scale must be administered by individuals who are thoroughly familiar with the child's behaviour. 4. Functional Assessment for Vision and Hearing Problem in Children This tool was developed by Sense International (India): This format can be used for assessing the functional vision and hearing problems among deafblind children and adults in special schools, villages or in camps. The simple questionnaire can be answered by observing the child in his familiar environment, with the support of the family members, teachers and the community. 18 ı Module on Training of Resource Teachers under SSA on Deafblindness We must understand that a deafblind child's assessment needs to be carried out by an appropriately qualified and experienced specialist because deafblindness affects all areas of development including the formation of parent-child relationships and advice and support to the family is vitally important. Families and children benefit greatly from a multi/trans disciplinary approach involving a range of professionals, including specialists from health and education, who can share their knowledge to provide support.

CHECK YOUR PROGRESS

1. Describe the ways in which the parents can be involved in the education of their special child.

2. How does the interaction of family and community affect the rehabilitation of a special child?
3. What are the areas in which school can give input to the parents and thus enable them to render their meaningful services?

2.10 Assignment/Activity

1. Observe the families with special children. Discuss the prevalent parental attitudes and interactions with their special child.

2.11 POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification on other. Note down those points below:

2.11.1 Points for Discussion

2.11.2 Points for Clarification

2.12 REFERENCES / FURTHER READING

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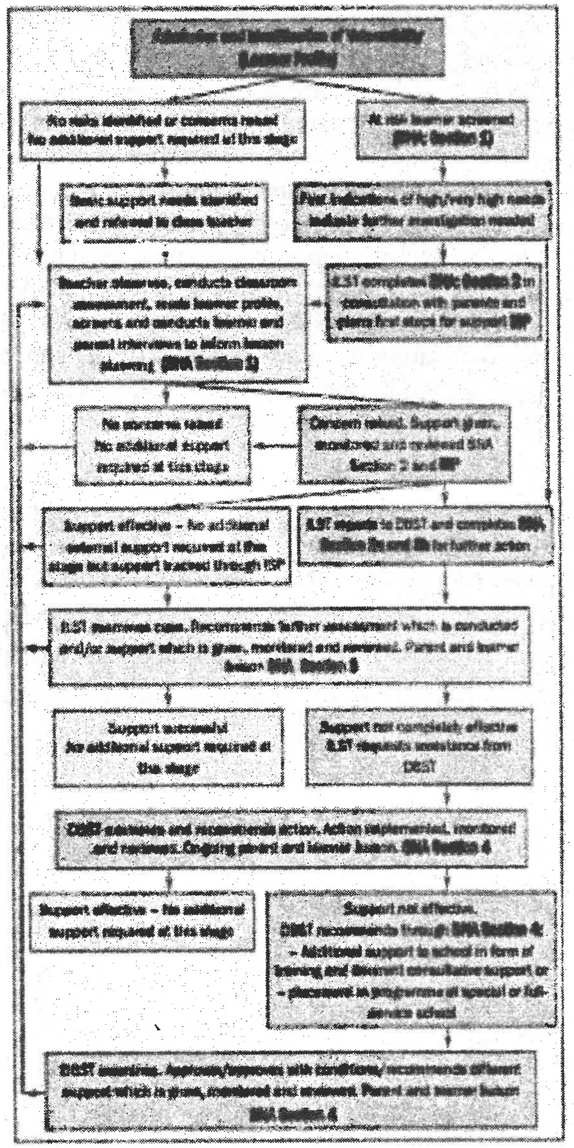
UNIT – 3 : SCREENING,ASSESSMENT, IDENTIFICATION & INTERVENTIONAL STRATEGIES OF DEAF-BLINDNESS

STRUCTURE

INTRODUCTION

The aim of introducing the SIAS strategy in the education system is to overhaul the process of identifying, assessing and providing programmes for all learners requiring additional support so as to enhance participation and inclusion. One of the key objectives of the strategy is to provide clear guidelines on enrolling learners in special schools and settings which also acknowledge the central role played by parents and educators

Figure 2 : Learner Screening, Identification, Assessment and Support Process Diagram



OBJECTIVES

These Guidelines will assist teachers, Institution-level Support Teams (ILSTs) and District-based Support Teams (DBSTs) to fill in all sections of the Support Needs Assessment Form related to the further assessment of learners who need additional support. The Toolkit consists of the following forms: • Learner Profile (not included in this document, but available at schools) Planning for Support At School Level Requesting and Provisioning of Additional Support It must be noted by all stakeholders involved that these forms are not to be seen as referral forms but as the first steps of planning and providing support to learners. The class teacher fills in a Learner Profile Form for every learner who is admitted to school. National Strategy on Screening, Identification, Assessment and Support The main purpose of the SIAS process is to: • plan how to bring support to the learner rather than take the learner to the support • provide indicators for support programme design Guidelines for filling in of forms Forms in Stage 1: • SNA: Diagnostic Profile SNA: Sections 1 and 2 (Support Needs Assessment Form) • SNA: Individual Support Plan (ISP) • SNA: Section 3a (Learner profile relating to nature and intensity of support • SNA: Section 3b (School Request form for Additional Support) • SNA: Section 4 (Action Plan for Additional Support Provision and Monitoring)

DEFINITIONS

The SIAS assumes four stages, that is, screening, identification, assessment, and support provisioning and monitoring. There is only one form for support needs assessment: the Support Needs Assessment (SNA). This form is divided into four sections, not all of which will be completed for every child who requires learning support. This is illustrated in Table 1 below

Table 1: Diagram of responsibilities

Stage of SIAS	Section of SNA1	Filled in for whom?	Filled in by whom?
1	Learner profile Section 1	- For all learners - For learners who have an indication of vulnerability	Class teacher DBST and Health Professionals Class teacher with support from the ILST and in consultation with Parents/caregivers
2	Section 2a and 2b Individual Support Plan	For learners: - for whom additional support must be put in place from the outset, e.g. learners with disabilities - who are identified in the course of teaching and learning as having additional support needs	ILST, in consultation with teacher and parent

Table 1: Diagram of responsibilities (continued)

Stage of SIAS	Section of SNA1	Filled in for whom?	Filled in by whom?
3	Section 3a: Determining nature and level of support Section 3b: Request for Additional Support Provision	For learners who need additional support	DBST, in consultation with ILST, school and parents
4	Section 4: Action plan for support provision and monitoring	For schools, educators and learners requiring high levels of support	DBST in consultation with school

Gain background information on the learner

Stage 1 applies to all learners upon entry to school, particularly those in Grade R and Grade 1. When the Learner Profile is completed and initial risk factors or indications of exceptional talent and giftedness, or the need for additional support is identified, the school must make arrangements for an interview with the parent/caregiver during which SNA: Section 1 is completed. Basic information is required at this stage which will inform an overall picture of who the child is, what his/her experience has been before arriving at the school, what his/her family and home circumstances are, and what his/her strengths, weaknesses and interests are (in the parents' view). The information in this section can be drawn in part from, and serves to supplement, information already gathered in the 'Learner Profile'. The second category of information relates to the learner's family and home situation, recognising that the child's identity is influenced by his/her family structure, the level and nature of contact with immediate family members or caregivers, such as siblings, parents, extended family, etc. Information on significant home circumstances may bear light on the level of support available, or not. Finally, the parent/caregiver's understanding of the child is sought to provide a perspective on the child's strengths and weaknesses, goals and aspirations, interests, personality, etc. Such information is necessary to provide a picture of the child through the way he/she is able to present him/herself at home and in other environments. Such information serves various purposes. It may suggest, for example, what activities may be included to accommodate the child's learning preferences, if appropriate and feasible within the learning environment, to further stimulate the child's interest and learning. It also provides the parent/caregiver's perspective which, when weighed against the teacher's and other perspectives at a later stage, will assist in the overall assessment of the child's support needs. In some cases the parent/caregiver's understanding of the child may in fact emerge as the barrier to learning and development, or a teacher's perspective may present as a barrier in the classroom. Such assessments demand extreme sensitivity to reach a non-biased, balanced appraisal. In this stage of the SIAS process a Diagnostic Profile (SNA, DP) must be filled in for a child who is at risk. The format of the profile is in line with similar forms used by the Department of Health to determine the severity or exact nature of a learner's disability or health support needs. It is based on the International Classification of Functions. The DBST must ensure that this form is completed by a health professional working in the district or at special schools or by medical doctor, medical practitioner, therapist in a hospital, primary health care clinic and/or private practice; it will help to provide a clearer understanding of the extent of the functional limitations experienced by children who are disabled or ill. In itself, this diagnostic profile provides no indication of the education support that is needed by learners, and it may not serve as a recommendation for educational placement or indication of level of support needs. Learners with one or more moderate or severe impairments should be reviewed for Level 4 or Level 5 support provision

Identify barriers to learning and development :
Stage 2 applies to learners who have been identified by the teacher as experiencing challenges in the learning process. Initial identification of learner needs would be based on accumulated evidence from the curriculum assessment process which includes observation, documentation from the learner's portfolio, workbooks, and

consolidated verbal and written information from other teachers, parents/caregivers, etc.

Once the learner has been initially identified, teachers will fill in Section 2 of the SNA form, in consultation with the ILST, parents/caregivers and even learners, where this is possible. Information gathered in Stage 2 of the process will enable the balancing of factors, both negative and positive, to inform a clearer understanding of the context in which the learner is experiencing a range of barriers to his/her learning and development. It focuses on barriers to learning and development which are related to the learner and his/her contextual needs, recognising that the context is a significant influence on the way in which learners learn and develop
The first part of Stage 2 (Section 2a) of the form requires a review of curriculum challenges experienced by the learner in one or more areas of learning. Essentially, this is a summary of the accumulative assessment conducted by relevant teachers for each learner, which forms part of the everyday teaching and learning process. Documentary evidence might include extracts from the learner's portfolio, workbooks, etc., and should be readily available to support information provided in this section. Information is also required about barriers experienced by the learner in terms of his/her ability to communicate, his/her behavioural and social competencies, health, wellness and personal care, and/or the level of physical access. The second part of Stage 2 (Section 2b) focuses on contextual factors which negatively and/or positively impact on the learner's potential for learning and development. The strategy recognises the need to provide support to address the barriers which may negatively affect the learner, such as a poor or violent home environment, poor parenting, poor teaching, a lack of teacher knowledge of the new curriculum and curriculum differentiation, an exclusionary school ethos, etc. At the same time it makes provision for accessing the available support where this is forthcoming, and creates possibilities for strengthening and using such positive support. For example, supportive parents, access to community-based support structures, a responsive teacher who is able to differentiate the lessons to accommodate diverse learner needs, an open and welcoming school ethos which allows

children to feel welcome and valued, etc. All these may assist the learner in overcoming barriers to learning

Stage 2 enables a process which encourages teachers, parents and the ILST to communicate about contextual barriers which exist for the learner, not just those perceived to be within the learner.

For many learners, stage 2 of the process of identification of support needs will provide sufficient information on how the school and teachers can effectively support a learner. In order to make sure that this support is actually provided and followed up through an ongoing review process, an Individual Support Plan (ISP) must be completed to outline what support will be provided at school level and how it will be monitored is attached. This Individual Support Plan of the Learner will be used at the end of each year when making decisions about progressions. The tracking process should include quarterly consultation with and involvement of parents/caregivers. Once the teacher identifies a learner as having support needs, she draws up an ISP to keep track of support given and progress made. The ISP is an important record maintained by the school of a learner's needs, goals and progress. The learner, parents, teachers, the ILST, LSE, counsellor or other support specialists could all be involved in drawing up, implementing and monitoring the document which will later be filed in the learner profile.

For many learners, stage 2 of the process of identification of support needs will provide sufficient information on how the school and teachers can effectively support a learner. In order to make sure that this support is actually provided and followed up through an ongoing review process, an Individual Support Plan (ISP) must be completed to outline what support will be provided at school level and how it will be monitored is attached. This Individual Support Plan of the Learner will be used at the end of each year when making decisions about progressions. The tracking process should include quarterly consultation with and involvement of parents/caregivers. Once the teacher identifies a learner as having support needs, she draws up an ISP to keep track of support given and progress made. The ISP is an important record maintained by the school of a learner's needs, goals and progress. The learner, parents, teachers, the ILST, LSE, counsellor or other support specialists could all

be involved in drawing up, implementing and monitoring the document which will later be filed in the learner profile.
Assessment of support requirements – establishing levels and nature of support Stage 3 is a formal assessment and review of the information provided in Stages 1 and 2. It is in this stage that decisions can be made about the level of support needed and the type of support package needed. This stage is managed and coordinated by the DBST. The approach is a multi-agency one, which requires that all significant partners are involved in decisions about the support package needed. Action planning for support provisioning and monitoring What support will be provided and where it will be accessed, and how it will be implemented and monitored. These decisions and plans around implementation
and responsibilities of each partner, should be recorded in Section 4 of the form. It would also serve as a tracking tool to monitor progress. In terms of the support needs, these are classified as in White Paper 6: Support packages consist of varying combinations of physical, human, and material resources. These packages may be simple or complex, and they correspond to the levels of support needed. In other words, levels 1 to 3 of support needs correspond with support packages for levels 1 to 3. Some sources of support (physical, human and material), apart from those within the school and the home, can be located in the local community. These may include:

a) Health Department/ health care practitioners
b) Department of Social Development/ social workers
c) NGO/DPO/HEI programmes
d) ECD service providers
e) Special School/Resource Centre

SUMMARY

The Strategy on Screening, Identification, Assessment and Support (SIAS) aligns with other Department of Education strategies which aim to support teachers, managers, Districts and parents in schools. The SIAS is designed to manage and support teaching and learning processes which affect learners within the system. It offers guidelines on how to

screen, identify, assess and support learners who experience barriers to learning, including those with disabilities, and thereby improve the teaching and learning environment for maximum participation by all learners. Often learners are faced with challenges in the learning process which are a result of a broad range of experiences in the classroom, at school, at home, in the community, and/or as a result of disability. The report of the joint National Commission on Special Needs in Education and Training (NCSNET) and the National Commission on Support Services (NCSS) (1997) referred to these challenges as 'barriers to learning and development'. These barriers may include
• socio-economic aspects (such as the lack of access to basic services, poverty and under-development), • factors that place learners at risk, for example, physical, emotional, and sexual abuse, political violence, HIV/AIDS epidemic, • attitudes, • inflexible curriculum at schools, • language and communication, • inaccessible and unsafe built environments, • inappropriate and inadequate provision of support services, • lack of parental recognition and involvement, • disability, • lack of human resource development strategies.
Education White Paper 6 (2001) is a response to these challenges and focuses on 'overcoming barriers in the system that prevent it from meeting the full range of learning needs'

The SIAS strategy forms part of the implementation of White Paper 6 and serves two key purposes:
• to screen and identify learners who experience barriers to learning and development, and • to establish a support package to address these barriers.
The strategy includes a SIAS tool-kit which consists of a single form Support Needs Assessment (SNA; see below) to be completed by teachers, parents, schools (including special schools) and Districts. The form is a tool which enables the engagement of the different partners in the process to: The SIAS tool-kit also includes guidelines which accompany the form to assist various partners in engaging in the process. Guidelines are provided for teachers (including the Institutional Level Support Team – ILST), managers, parents, planners and District-based support teams (DBSTs). The ILST and the DBST are two structures

established as part of the overall implementation of the Inclusive Education policy. They play a key role in the SIAS process, as do teachers, parents/caregivers, managers and other support services within the local community. Once the Learner Profile form is completed for a learner, and it is clear that the learner might have additional support needs, the SIAS toolkit is used to achieve a deeper understanding of his/her needs. All information will be recorded on the SIAS form (SNA). All diagnostic information will be provided by a doctor, medical practitioner, or health clinic on the Diagnostic Profile. Any other supporting information, for example, professional assessments, psychologists' or therapists' reports, selected curriculum and any other relevant information, should be kept together with the SNA form, for each learner. This profile will follow the learner throughout the GET and FET phase, so that information regarding the learner's experience and his/her progress is readily available. Such information should be held by the ILST and made available to teachers only if this is necessary, and if consent is granted by the parent/caregiver and/or learner2 involved, or if the parents/caregiver and/or the learner requests that the information be shared with teachers to make them aware in advance of the needs of the learner.

CHECK YOUR PROGRESS

1. Within a particular system which particular model of education should be promoted?
2. What is the need for transition from one model to another and time span and criteria for the same?
3. How can one involve various criteria of establishing efficacy and evaluate performance of a particular system and reliability of that criteria?

3.8 ASSIGNMENT / ACTIVITY

1. What is the possibility of adopting a middle path approach and what should be the level of inclusion, integration and residential support?

3.9 POINTS FOR DISCUSSION AND CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification on other. Note down those points below:

3.9.1 Points for Discussion

3.9.2 Points for Clarification

3.10 REFERENCES/ FURTHER READINGS

1. Azad, Yaseem (1996): Integration of disabled in common schools - A survey of IEDC in the country: Department of Education of Groups with Special Needs, NCERT, p-53.
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UNIT – 4 : FOSTERING EARLY COMMUNICATION DEVELOPMENT: METHODS, ASSISTIVE DEVICES AND PRACTICES INCLUDING AAC

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

The use of augmentative and alternative communication (AAC) services and supports with infants and young children has been limited, owing to a number of myths about the appropriateness of AAC use with this population. This article will provide an overview of some of the myths that have hampered the inclusion of AAC into early intervention service delivery and refutes them. It will then examine some of the realities that must be considered when delivering AAC services and supports to young children. Key words: augmentative communication, severe disabilities, speech and language intervention

OBJECTIVES

For young children who present with significant communication disabilities, there are also limited tools available that can provide an adequate assessment of the young child's communication strengths and weaknesses. The more challenging the child's disabilities, the more difficult it can be to assess the child's language and communication skills. One particularly important, yet challenging, area of research need is that of language and communication measurement tools (Sevcik, Romski, & Adamson, 1999). Attention must be focused on the development of assessment tools that provide a fine-grained analysis of the child's language and communication skills across modes and that measure a range of intervention outcomes over time. Sevcik and Romski (2002) reviewed assessment options available for the examination of early comprehension skills during the child's communication assessment. Some outcomes of using AAC go beyond the development of specific comprehension and production vocabulary, and even grammatical skills, and have been somewhat elusive to quantitative measurement. Communication access can also prevent the emergence of secondary disabilities (e.g., challenging behaviors). Tools that permit measurement of these elusive outcomes are important to develop. Transitions The young child can make a number of transitions during this early period. Over a period of 3 years, the child must transition from early intervention services that are usually delivered in the family or home environment to a preschool classroom. This type of transition is complex and includes many different aspects. It is important to stress that parents are a source of expertise about how a child communicates when service providers change. Incorporating AAC during early communication development requires a focus on language and communication development within the context of the AAC mode. Sometimes schoolbased clinicians are not open to the use of AAC because it is not readily available or they are constrained by 1 or more of the 6 myths. It is particularly important that communication be a focus during the transition process

DEFINITIONS

FOR more than 3 decades now, the field known as augmentative and alternative communication (AAC) has addressed the communication needs of children and adults who cannot consistently rely on speech for functional communication (e.g., Beukelman & Mirenda, 2005). Numerous developments in the hardware and software options available to an individual using AAC, including speech output capabilities, have occurred from the 1980s to the present. The capacities of the devices and the intelligibility of the voices have improved substantially. (See the Communication Aids Manufacturers' Association Web site, http://www.aacproducts.org, for the range of technology available.) Simultaneously, there also have been important developments in the empirical knowledge base to support decision making for successful clinical assessment and intervention. From the Georgia State University, Atlanta, Georgia. The preparation of this article was funded in part by grant DC03799 from the National Institutes of Health and a Research Program Enhancement Grant from Georgia State University. The authors contributed equally to the preparation of this article. Corresponding author: MaryAnn Romski, PhD, CCC-SLP, Department of Communication, Georgia State University, PO Box 4000, Atlanta, GA 30302 (e-mail: mromski@gsu.edu). Despite these advances, the inclusion of AAC services and supports into early intervention service delivery for young children has been hampered primarily by myths about the specific types of roles AAC plays. The purpose of this article is to examine these myths, in light of the current literature on the early language development period, and to provide arguments and data to refute them. To meet this goal, we will provide an overview of how language and communication skills emerge in young typically developing children and the roles AAC may play in facilitating the development of young children with significant communication disabilities. Next, we will examine some of the myths and then discuss the issues that contribute to the successful delivery of AAC services and supports for young children. TYPICAL PATTERNS OF EARLY LANGUAGE DEVELOPMENT Young children use language for many purposes, including to meet their wants and needs, to gain knowledge about the world around them, to develop and maintain social relationships, and to exchange information with others. In order for young children to develop functional language and communication skills, they must be able to comprehend 174 LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 Augmentative Communication and Early Intervention 175 and produce language so that they can take on the reciprocal roles of both listener and speaker in conversational exchanges (Sevcik & Romski, 2002). Sevcik and Romski (2002) defined language comprehension as the ability to understand what is said to us so that we can function as a listener in communicative exchanges. Conversely, they characterized language production as the ability to express oneself so that one can function as a speaker in conversational exchanges. Language comprehension Spoken language comprehension skills assume an extremely important role in the early communication development of typically developing children (Adamson, 1996). From birth on, young, typically developing, children hear spoken language during rich socialcommunicative interactions that include reoccurring familiar situations or events (Bruner, 1983; Nelson, 1985). Well-established routines draw the young child's attention to word forms and their referents in the environment. Word input from the caregiver to the child also permits the caregiver to create new learning opportunities by capitalizing on wellestablished routines and the child's understanding of them (Oviatt, 1985). These social and environmental contexts converge with the available linguistic information to produce understandings (Huttenlocher, 1974). Contextual, or situational, speech comprehension begins to emerge as early as 9 months of age and by 12–15 months the child understands, on average, about 0 words without contextual supports (Benedict, 1979; Miller, Chapman, Branston, & Reichle, 1980; Snyder, Bates, & Bretherton, 1981). This type of comprehension means that children first learn to respond to words in highly contextualized routines that include situational supports (Platt & Coggins, 1990). For example, a child touches the blocks after her mother says "go get the blocks"and simultaneously points to them. The understanding of these words progress developmentally from person and object names to actions and from present to absent person and object names. The most common compositions of the first 50 receptive words include people, games and routines, familiar objects, animals, body parts, and actions

(Fenson et al., 1994). Recently reported methodologies suggest that from the outset the young child relies on comprehension to build a foundation for later productive word use (Hollich, Hirsh Pasek, & Golinkoff, 2000). As children move through their second year of life, the character of their understanding of words changes. By 24 months, they rely more on social cues than on perceptual cues (Hollich et al., 2000). They also quickly expand their understanding from single words to relational commands, such as "Give daddy a kiss," and can carry out such instructions (Goldin-Meadow, Seligman, & Gelman, 1976; Hirsh-Pasek & Golinkoff, 1996; Roberts, 1983). Golinkoff, Hirsh-Pasek, Cauley, and Gordon (1987) reported that typically developing children as young as 17 months of age, who were characterized as productively one-word communicators and not producing word order, actually comprehended word order (e.g., "Big bird tickle Ernie." "Ernie tickle big bird.") when a videobased preferential looking paradigm was employed to assess their skills. Interestingly, Fenson and his colleagues (1994) reported overlap between the words young children comprehended and produced, although comprehension was shown to have a developmental advantage in the majority of the children they studied. Young typically developing children quickly move on to word production, and the child's ability to comprehend words, and even sentences, is assumed by the adults in the child's environments. Since word production skills emerge so quickly in typical children, they may mask and overshadow the continuing role speech comprehension plays in the early language development process. Comprehension may play a particularly important role for the young child who is encountering great difficulty with this process. LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 176 INFANTS & YOUNG CHILDREN/JULY–SEPTEMBER 2005 Language Production Young children typically begin to speak before 2 years of age. From birth to approximately 18–21 months of age, the young typically developing child advances through the stages of intentional communication development (perlocutionary or preintentional, illocutionary or intentional) learning that he or she can control the world through communication. (See Brady & McLean, 2000, for a review.) Somewhere between 12 and 15 months the young child begins to produce first word approximations and slowly starts to develop a vocabulary. At about the same time that the young typically developing child attains a 50-word productive vocabulary (18– 21 months) and experiences a spurt in vocabulary size, he or she is also beginning to combine words. So, prior to the time a child has a 50-word vocabulary, the focus of communication development is on learning about the social functions and the meaning of language rather than on its grammatical dimensions. The child who is not yet talking may use comprehension skills as a way to break into language. Overview The beginning period of language development is rich with opportunities for the young child to develop a firm language foundation even though he or she is not yet talking. This foundation includes opportunities to develop comprehension skills and to communicate via vocalizations, gestures, and other means even before he or she uses a conventional output mode such as speech, manual signs, or symbols. The literature on typically developing children's language development strongly suggests then that these early types of experiences are important for later language development. It also illustrates the development of communication, language, and speech—3 distinct but related processes. Early language interventions must consider how these receptive and expressive experiences can be incorporated into intervention strategies during the beginning developmental period through the means of AAC. YOUNG CHILDREN WITH DEVELOPMENTAL DISABILITIES Every day, children who cannot speak face social and educational isolation as well as significant frustration because they are unable to communicate their necessities, desires, knowledge, and emotions to their parents, siblings, extended family members, peers, and teachers. These limitations may be due to some type of congenital disability that hinders their development of speech or having experienced an injury or illness very early in life that substantially limits the speech and language abilities they are developing. Autism, cerebral palsy, cognitive disabilities, dual sensory impairments, genetic syndromes, multiple disabilities (including hearing impairment), or even a stroke at or near birth are congenital disabilities that may impede the development of speech and language skills. A young child also may encounter difficulty communicating via speech through a traumatic brain injury as a result of an accident, stroke, or, in rare instances, even severe psychological trauma. Most children with developmental disabilities do develop functional spoken communication skills during their childhood (Abbeduto, 2003); thus children who do not eventually speak form a relatively low incidence population. There are certainly individual differences in communication patterns. Not every child presenting with one of these disorders is, or will be, nonspeaking across his or her entire life span, but children within this broad range of disabilities may use AAC at some point during their early development to augment natural speech so that they can communicate and develop language skills. WHAT IS AUGMENTATIVE AND ALTERNATIVE COMMUNICATION? Communication is defined in the broadest sense as "any act by which one person gives to or receives from another person information about that person's needs, desires, perceptions, knowledge, or affective states" (National Joint Committee [NJC], 1992; http:// www.asha.org/njc). Language is an arbitrary LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 Augmentative Communication and Early Intervention 177 code that we use to communicate with one another and speech is an output mode that uses the oral mechanism. By definition, AAC is an intervention approach (Glennen, 2000) that uses manual signs, communication boards with symbols, and computerized devices that speak and incorporate the child's full communication abilities. These abilities may include any existing speech or vocalizations, gestures, manual signs, communication boards and speech-output communication devices. (See American Speech-Language-Hearing Asociation [ASHA], 2002, for a comprehensive definition of AAC.) In this sense, then, AAC is truly multimodal, permitting a child to use every mode possible to communicate messages and ideas. AAC abilities may change over time, although sometimes very slowly, and thus the AAC system selected for use at one age may need to be modified as a young child grows and develops (Beukelman & Mirenda, 2005). A child can communicate using a range of representational mediums from symbolic (e.g., speech or spoken words, manual signs, arbitrary visual-graphic symbols, printed words) to iconic (e.g., actual objects, photographs, line drawings, pictographic visualgraphic symbols) to nonsymbolic (e.g., signals such as crying or physical movement). (See Mineo Mollica, 2003, and Sevcik, Romski, & Wilkinson, 1991, for discussions of visualgraphic representational systems.) In addition to the vocalizations and gestures that some young children use, they may benefit from other dimensions of AAC when communicating with familiar and unfamiliar partners across multiple environments. Some young children have no conventional way to communicate and may express their communicative wants and needs in socially unacceptable ways, such as through aggressive or destructive, self-stimulatory, and/or perseverative means. AAC systems can replace these unacceptable means with conventional forms of communication. Typically, forms of AAC are divided into 2 broad groups, known as unaided and aided forms of communication. Unaided forms of communication consist of nonverbal means of natural communication (including gestures and facial expressions) as well as manual signs and the American Sign Language (ASL), and can be employed by children who are able to use their hands and have adequate fine-motor coordination skills to make fine-grained production distinctions between hand-shapes. Of course, communication partners too must be able to understand the signs for communication to take place. Aided forms of communication consist of those approaches that require some additional external support, such as a communication board with symbols (i.e., pictures, photographs, line drawings, symbols, printed words) or a computer that "speaks" for its user (also known as a "speech-generating"device) via either synthetically produced speech or recorded natural (digitized) speech. From laptop computers that talk and can perform a wide range of other operations (e.g., word processing, World Wide Web access) to computerized devices dedicated to communication, technological advances have produced a range of opportunities for communication. These boards and devices typically display visual-graphic symbols that stand for, or represent, what the child wants to express. Some children create messages using printed English words or letters of the alphabet. Access to aided forms of communication can be via direct selection or scanning. Direct selection techniques include pointing with, for example, finger, hand, head (through a head stick), eyes, or feet. Scanning is a technique in which the message elements are presented to the child in a sequence either by a person or the device. The child specifies his or her choice by responding yes or no to the person or the device after each element is presented.

Scanning can be, for example, linear, circular, or row-column and encoding (e.g., Morse Code; see Beukelman & Mirenda, 2005, for a detailed description of these techniques). AAC can play at least four different roles in early intervention. The role(s) an AAC system plays will vary depending on an individual child's needs. These roles are as follows: augmenting existing natural speech, providing a primary output mode for communication, LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 178 INFANTS & YOUNG CHILDREN/JULY–SEPTEMBER 2005 providing an input and an output mode for language and communication and serving as a language intervention strategy. The most common and well-known role is to provide an output mode for communication. For example, Janie is a 24-month-old girl with spastic cerebral palsy and quadraplegia whose attempts at speech are unintelligible to everyone other than her family members owing to severe dysarthria. She understands almost everything that is said to her. Janie could use an AAC system as a primary communication output mode in her interactions with adults and other children across a variety of settings. The other roles, however, can be equally important, especially for the very young child just beginning to develop communication skills. David is 36 months old, has some challenging behavior (i.e., head banging) and a very recent diagnosis of autism. He understands less than 20 words and has just a few undifferentiated vocalizations. He is learning to use AAC to indicate his wants and needs to his family and teachers. In this case, AAC serves a very different role than it did for Janie functioning as an input-output mode and a language intervention strategy. Using a developmental perspective, AAC interventions (i.e., gestures, devices, switches) can be viewed as a tool that aids or fosters the development of early language skills and sets the stage for later vocabulary development and combinatorial language skills regardless of whether the child eventually talks or not. MYTHS ABOUT AAC A myth is defined as "a widely held but false belief" (Oxford, 2002). Clinical myths Table 1. Myths about AAC use Myth 1 AAC is a "last resort" in speech-language intervention. Myth 2 AAC hinders or stops further speech development. Myth 3 Children must have a certain set of skills to be able to benefit from AAC. Myth 4 Speech-generating AAC devices are only for children with intact cognition.

Myth 5 Children have to be a certain age to be able to benefit from AAC. Myth 6 There is a representational hierarchy of symbols from objects to written words (traditional orthography). are derived from individual professional's beliefs or assumptions sometimes without any empirical support. Sometimes myths are perpetuated despite empirical evidence to the contrary. A limited research base along with the immediate demands of providing clinical services have fostered practice that relies more on a professional's clinical intuition than on current data (Cress, 2003; NJC, 2002). There are at least 6 myths, listed in Table 1, that have developed about the use of AAC. Each myth has grown out of information expressed in clinical literature but has not necessarily been backed up by empirical evidence to support or refute its use. Unfortunately, the myths remain and have become integrated into clinical practice. Their use in clinical practice may result in young children being inappropriately excluded from AAC supports and services ("AT/AAC Enables"Web site (http://depts.washington.edu/enables/); Cress & Marvin, 2003; NJC, 2002). Myth 1: AAC is a "last resort" in speech-language intervention When AAC was first emerging as an intervention strategy, it was considered a "last resort," to be employed only when every other option for the successful development of speech had been exhausted. In 1980, Miller and Chapman argued for a set of decision rules that indicated AAC was to be considered when speech had not developed by age 8 years (Miller & Chapman, 1980). Since that time, additional information has emerged to change the use of decision rules such as these. The use of AAC interventions should not be contingent on failure to develop speech skills LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 Augmentative Communication and Early Intervention 179 or considered a last resort because AAC can play many roles in early communication development as described earlier (e.g., Cress & Marvin, 2003; Reichle, Buekelman, & Light, 2002). In fact, it is critical that AAC be introduced before communication failure occurs. This change means that AAC is not only for the older child who has failed at speech development but also for a young child during the period when he or she is just developing communication and language skills, to prevent failure in communication and language development. Myth 2: AAC hinders or stops further speech development The myth that AAC is a "last resort" goes hand in hand with another myth about AAC. It is the impression that AAC will become the child's primary communication mode and take away the child's motivation to speak. In fact, the fear many parents, and some practitioners, have is simply not supported by the available empirical data. The literature actually suggests just the opposite outcome. There are a modest number of empirical studies that report improvement in speech skills after AAC intervention experience (see Beukelman & Mirenda, 1998; Romski & Sevcik, 1996, for reviews). Sedey, Rosin, and Miller (1991), for example, reported that manual signs had been taught to 80% of the 46 young children with Down Syndrome (mean chronological age 3 years, 11 months) that they surveyed. The families of these children also reported that they discontinued the use of the manual signs when the child began talking or when the child's speech became easier to understand. Miller, Sedey, Miolo, Rosin, and Murray-Branch (1991) also reported that when sign vocabularies were included, the initial vocabularies of a group of children with Down Syndrome were not significantly different from those of mental-age–matched typically developing children. Adamson and Dunbar (1991) described the communication development of a 2-year-old girl with a long-term hospitalization and a tracheostomy (i.e., an incision into the trachea [windpipe] that forms a temporary or permanent opening for the child to breathe) who used manual signs to communicate. When the tracheostomy tube was removed, she immediately attempted to speak and quickly used speech as her primary means of communication. Romski, Sevcik, and Adamson (1997) evaluated the effects of AAC on the language and communication development of toddlers with established developmental disabilities who were not speaking at the onset of the study. Although the families of these very young children were much more receptive to using AAC than the investigators initially thought they would be, they were quick to focus exclusively on speech when their child produced his or her first word approximation. For very young children, the use of AAC does not appear to hinder speech development (Cress, 2003). In fact, it may enhance the development of spoken communication, which should be a simultaneous goal for intervention. Myth 3: Children must have a certain set of skills to be able to benefit from AAC In the past, young children with some degree of cognitive disability were frequently excluded from AAC intervention because their assessed levels of intelligence and their sensorimotor development were not commensurate with cognitive/sensorimotor skills that had been linked to early language development (Miller & Chapman, 1980; Mirenda & Locke, 1989; Romski & Sevcik, 1988). While one may argue that some basic cognitive skills are essential for language to develop, the exact relationship between language and cognition have not been specified clearly (see Rice, 1983; Rice & Kemper, 1984, for reviews). Investigators have argued against excluding children from AAC interventions based upon intellectual performance and/or prerequisite sensorimotor skills (Kangas & Lloyd, 1988; Reichle & Karlan, 1988; Romski & Sevcik, 1988). Given the overall impact language exerts on cognitive development, a lack of expressive language skills may put an individual at a distinct developmental disadvantage (Rice & Kemper, 1984). Some individuals LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 180 INFANTS & YOUNG CHILDREN/JULY–SEPTEMBER 2005 with severe sensori-motor disabilities cannot demonstrate their cognitive abilities without a means by which to communicate so we cannot insist on evidence of those abilities before providing AAC services and supports. There is also some evidence that severe physical disabilities and limited communication skills may interfere with the course of early cognitive development, in particular the development of object permanence and means-ends skills. Thus, developing language skills through AAC may be of critical importance if the individual is to make functional cognitive gains as well. Myth 4: Speech-generating AAC devices are only for children with intact cognition The cognitive skills a young child brings to the intervention task can vary from no evidence of cognitive disabilities to that of severe cognitive disabilities. Another myth related to Myth 3 relates to the use of speech-generating devices. In the past, computer-based AAC devices were often limited to children who had intact cognition by clinicians for 2 main reasons. First, the devices were expensive and thus it was argued that the money should only be spent on children who could "truly benefit" from the device (Turner, 1986). Second, early computer-based devices often required a fairly sophisticated set of cognitive skills in order to operate them and thus were provided only to those children who had such a level of skill. Neither of these 2 reasons are true today. The technological developments in AAC devices have made a broad range of options available to young children. There are now many choices of AAC devices that speak from simple inexpensive technology (like single switches) to complex systems that permit access to sophisticated language and literacy skills. This broad range of options include devices that are modestly priced

SUMMARY

These 6 myths grew out of early thinking about how to use AAC services and supports. None of these myths are supported by the current literature on early intervention and AAC. However, they are often discussed when AAC is considered as part of the intervention plan for a young child. The delivery of AAC services and supports must be accomplished in the broader context of early intervention services. There is a growing recognition of the merits of implementing AAC interventions with young children (Cress & Marvin, 2003; Culp, 2003). First, the use of AAC is mandated as part of the implementation of Part C of the Individuals With Disabilities Education Act. And, second, AAC technologies are becoming increasingly available at a reasonable cost. Implementing AAC raises a number of issues that are only beginning to be explored. These issues include, though are not limited to, families as partners, assessment issues, transitions, and training for professionals. Families as partners There are a number of important issues related to the family and the child. When AAC intervention is begun early in life, at least 2 additional issues need to be considered by professionals and families (Berry, 1987). First, families are still coming to terms with their young child's disability (Wright, Granger, & Sameroff, 1984) and often seek a broad variety of interventions (e.g., speech-language therapy, occupational therapy, physical therapy, educational therapy) to help their child overcome his or her limitations. These interventions may include highly publicized interventions (e.g., direct instruction, floor-time) or multiple types of speech-language therapy (e.g., therapy focused on feeding issues, therapy focused on speech-language development). Second, there appear to be fewer structured routines outside the home in which to place AAC intervention, than in the school child's day, including opportunities for communication with others during the young child's day. Thus, the toddlers' family may take a primary role in the intervention process in addition to their other parenting responsibilities (Crutcher, 1993). Fulfilling this primary interventionist role may require different external supports and organization than is the case when a child is school-aged. Kaiser and Hancock (2003) reported that parentimplemented language intervention is a complex phenomena that requires a multicomponent intervention approach. Romski, Sevcik, and Adamson's (1997) preliminary findings regarding initial choice about AAC suggest that engaging in early augmented language intervention may be a more complex decision than professionals initially anticipate. Parent perception about communication and parental stress may play roles in augmented language intervention. In general, today's parents may not be afraid of the use of technology because of extensive parent education about the importance of getting communication started and the increased use of computers in daily life. Understanding how to arrange early augmented language intervention to be able to capitalize on the communicative roles family members may typically play has not been examined to date. In addition, sometimes, parental knowledge about AAC device choice LWW/IYC lwwj111-02 June 4, 2005 3:47 Char Count= 0 182 INFANTS & YOUNG CHILDREN/JULY–SEPTEMBER 2005 exceeds professional knowledge and experience with AAC devices because parents readily use the Internet to gain information. Such discrepancies in knowledge and experience can serve to create challenges for teams in determining and providing services. One of the difficulties families face is that they want their young children to talk. Their expectations for production may lead to a competition between a focus on developing a way to communicate and a focus on having the child speak, even if the speech the child produces is imitative in nature. Thus, interventions that do not confuse the parents or children but instead permit them to focus their energies on a specific goal are needed.

The reality is that it is never too early to incorporate AAC into language and communication intervention for the young child with a significant communication disability. The AAC devices and strategies are a tool, a means to an end—language and communication LWW/IYC lwwj111-02

June 4, 2005 3:47 Char Count= 0 Augmentative Communication and Early Intervention 183 skills—not the end. Incorporating AAC during early communication development requires a focus on language and communication development within the context of the AAC mode. AAC is sometimes thought of as a separate area of practice, and thus clinicians do not always incorporate the information they know about language and communication development as they consider AAC assessment and intervention. Often speech-language pathologists think that "someone else" will provide AAC services for the children on their caseloads. It is imperative that AAC be linked to early language and communication development. There is a strong history of empirical data to draw on as clinicians make practice decisions about intervention strategies for early communication development. Clinical decisions must be guided by empirical data in the context of clinical judgment not just by "beliefs" (Romski, Sevcik, Hyatt, & Cheslock, 2002). AAC is not a last resort but rather a first line of intervention that can provide a firm foundation for the development of spoken language comprehension and production. It can set the stage for further language and communication development during the child's preschool and early school years. It also can open the door for the child's overall developmental progression.

Revision

1. State the effects of deafness on the functioning of a deaf child /person.

2. Explain the terms,

- Prelingually Deaf
- Postlingually Deaf
- Deaf & Dumb
- Heterogeneity in the deaf population
- Primary signaling system and secondary signaling system of communication

3. Explain the similarities and differences in the life-style of the adult deaf and the hearing adult population.

ASSIGNMENTS/ACTIVITIES

1. State the effects of deafness on the functioning of a deaf child/person.
2. Compare the life style of 'adult deaf' and 'adult hearing' population. Give examples of two H.I. adults.

POINTS FOR DISCUSSIONS AND CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification. Note down those points:-

Points for Discussion

Points for Clarification

1.17 REFERENCES/ FURTHER READING

Hans G. Furth, *Thinking without language – Psychological Implications of Deafness* (New York : The Free Press, 1966)

J.M. Bamford and J.C. Saunders, *Hearing Impairment, Auditory Perception and Language Disability,* (London : Whurr Publisher, 1994

National Information Centre on deafness & National Association of the Deaf *Deafness : A fact Sheet* (Washington DC : Gallaudet University Press, 1984, 1987.

Gallaudet Encyciopedia of Deaf people and Deafness. Ed. : John V. Van Cleve; Volume I (McGraw Hill Inc., 1987.

UNIT – 5 : ADDRESSING ORIENTATION, MOBILITY & EDUCATIONAL NEEDS OF STUDENTS WITH DEAF-BLINDNESS

STRUCTURE

- **Introduction**
- **Objectives**
- **Definitions**
- **Summary**
- **Revision**
- **Assignment/Activity**
- **Points For Discussion And Clarification**
- **References / Further Readings**

INTRODUCTION

For the child who is deaf-blind, movement is an opportunity to gather sensory information, to communicate, and to make choices. Orientation and mobility (O&M) instruction provides a set of foundational skills that can broaden the students awareness of the environment, resulting in increased motivation, independence and safety.

OBJECTIVES

Children learn about their environment as they move through it—about people and objects, sizes, shapes, and distances. For typically developing children the senses of sight and hearing provide the greatest motivation for exploration. These children will use their vision and hearing to gather information about their surroundings while growing in understanding of their own bodies and their own capabilities of movement. The sight of toys or people and the sounds of voices or objects encourage them to move and discover. As they do so, they gather, recognize, and interpret an amazing array of sensory information.

DEFINITONS

A child who is deafblind must learn to understand his or her environment with minimal or distorted visual and auditory information. Limited sight and/or hearing may inhibit natural curiosity and the motivation to move about. As a group, learners who are deaf-blind are quite diverse and may include children with physical, cognitive, or health problems in addition to combined hearing and vision losses. Some may feel insecure or frightened when moving about in an environment they can neither see nor hear clearly. Others may run on the track team or use motorized wheelchairs. Some communicate with speech or sign language, while others may not have had enough experiences in the environment to understand even basic concepts about that environment or about objects found in it. It is essential that children who are deaf-blind receive learning opportunities and instruction that facilitate purposeful movement.

Orientation and Mobility (O&M) instruction provides students who are deafblind with a set of foundational skills to use residual visual, auditory and other sensory information to understand his or her environment. For the child who is deaf-blind, movement is an opportunity to gather sensory information, to communicate, and to make choices. O&M instruction provides opportunities and skills that can broaden the student's awareness of the environment, resulting in increased motivation, independence and safety.

Consider the following example: Alex, a sighted and hearing child, is playing with Jason, his brother who is deaf-blind, in their bedroom. When Alex hears the front door opening, he assumes his mother has come home from work. This interpretation is reinforced when he hears the family dog barking excitedly. Wishing to greet his mother at the door, he quickly walks from his bedroom, safely avoiding the many toys scattered on the floor, continues traveling down the hall, moving through the kitchen and around the dining table. While running to greet his mother, he sees that she is carrying a large square cardboard box. Immediately recognizing the logo from his favorite pizza restaurant, he knows she has brought home his favorite dinner, a pepperoni pizza. Excitedly, he offers to carry the box back to the kitchen and completes this task successfully and proudly.

In this rather routine event, spanning only a few minutes, Alex has gathered and interpreted much visual and auditory information. Not only does he understand that his mother is home, but also that he can greet her at the front door if he hurries, and that they are about to eat his favorite meal. In moments, the sensory information he gathered and processed provided him easy access to his environment, allowing him safe movement through the house. Seeing the pizza box also provided him with clues about immediate future activity.

For Jason, however, the scenario is a bit different. He knows someone has entered the house because he was playing with the dog when the animal suddenly became excited, began to bark, and then ran out of the room. Jason may sense or hear some of this activity by partially seeing or feeling the dog alerting him. As the result of his O&M instruction, he now travels down the hall using a protective technique to move safely around the toys. He moves through the kitchen and around the dining table. By now, he can smell the pizza and becomes excited because pizza is one of his favorite foods. His O&M training has taught him how to move safely through his environment, determining where his mother might be. His mother greets him, allows him to feel the warm box, and communicates that she has brought home pizza. The mother and son use guided travel to walk to the kitchen.

From O&M instruction, Jason has learned to interpret and utilize available sensory information.

He knows how to move safely through the environment and he is rewarded with success in finding out what he wanted to know.

What is O&M for the Child Who Is Deaf-Blind?

Orientation skills allow us to know where we are, where we are going, and how to think about and plan strategies for getting to a destination. **Mobility** involves the actual movement from place to place. Along with communication skills and daily living skills, O&M skills are essential for all children who are deaf-blind. The ability to understand the environment and to move safely within it is an important component of future development, success, and independence.

O&M instruction for individuals who are deaf-blind is designed to teach them to move as independently and as purposefully as they are able. For some children who are deaf-blind, it is reasonable and desirable to expect that they will move about independently in both indoor and outdoor environments. This independence may mean using a long white cane to cross streets successfully and learning to use city transportation systems. For others, O&M instruction will provide the skills necessary to allow independent movement within the classroom or within the home. At a more basic level, and for children with limited motoric capabilities, increased independence will mean that they have better developed residual senses and can more fully understand and interpret information from their environments. They may come to understand where an object is located and where the object is in relation to their own bodies. They will have the ability to move with purpose, perhaps to extend an arm or roll to obtain that object.

While outcomes and expectations may be different for the student who is deaf-blind, the instruction is similar to that for a child with only visual impairment or blindness. The most important adaptations are those related to**communication**. The O&M instructor will need to ensure that instructions are given to the student in his or her primary language. This may require the use of an interpreter and the development of touch cues or object cues. Certain accommodations that enable the student to interact with the public also need to be developed. For some children, the lack of auditory and visual input may have severely limited opportunities to learn about his/her environment and to develop the language to talk about it. O&M instruction must often be augmented by hands-on learning to make up for the child's lack of prior experience. Language instruction is an integral part of any O&M training experience.

A Team Approach

Originally designed to assist veterans blinded in war, O&M techniques and instruction have broadened over the past few decades to include children who are blind or visually impaired and, more recently, children who are deafblind, children with multiple disabilities, and infants and toddlers who are visually impaired. The 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA), Public Law 105-17, identifies orientation and mobility as a related service that teams may consider in the development of the IEP. Early focus on O&M instruction is essential for the child who is deaf-blind to develop the skills needed to travel and move independently about the environment.

A team approach is vital in the development and implementation of O&M instruction. A team may be composed of a parent, regular and special education teachers, other related services personnel, a representative of the local education agency, other individuals who may have special knowledge regarding the child and, where appropriate, the child. Each team member brings a unique perspective to the development of an appropriate educational program. The O&M specialist will participate in team-based assessments of the child and works collaboratively with all team members, including the parents, to address the unique O&M needs of the child. The O&M specialist also provides the team with activities that reinforce movement skills and promote understanding of the environment. He or she assists in analyzing the home and school environments and makes recommendations for strategies that may improve a child's ability to travel within, and better understand, these environments. The O&M specialist may be involved in directly teaching the child specific skills he or she needs to travel safely and will share these with other team members so each can reinforce them with the child. The O&M specialist may also work with other team members to ensure that each understands and shares in the responsibility of supporting an appropriate, individually developed O&M instruction program that reinforces movement, promotes orientation, and encourages independent travel and purposeful movement.

Instructional Strategies

It is best to view O&M instruction, as identified in the student's IEP or IFSP, as a process that begins with assessment. The process is cyclical and ongoing.

Once a program is developed and implemented, the evaluation is ongoing, with data used to inform decisions about changes that may be necessary for instruction. All instructional components of each child's program must be continuously evaluated for effectiveness, with modifications made as necessary.

Assessment

Initial assessment of O&M skills provide the foundation for future program planning. The O&M specialist will work closely with other team members to identify and implement appropriate assessment techniques. Assessment may include the following:

- Informal student observation, conducted in natural environments in which the student interacts (home, school, etc.).
- Assessment of communication skills and necessary adaptations.
- Parent/caretaker interviews.
- Formal assessment of orientation and mobility skills.
- Assessment of learning modalities.
- Developmental assessment of:
  Sensory skills.
  Cognition.
  Motor skills (gross and fine).

- Environmental analysis. Environment analysis is a key component of the assessment process. The various environments in which the student is involved should be assessed for safety. The need for any modifications that may enhance a child's ability to travel in and understand the environment should also be assessed.

Program Development and Implementation

Communication. Developing ways to communicate presents the most significant challenge for children who are deaf-blind. Communication issues must be addressed in every aspect of instruction. For example, planning for instruction in areas such as concept development must take into account that although the child may be able to perceive the shape or configuration of a hallway intersection, he or she may need to be taught the specific language ("triangle" or "corner") for that perception.

Children who are deaf-blind use a variety of communication methods including tactile sign language or American Sign Language (ASL), speech, gestures, fingerspelling, augmentative devices, pictures, objects, body movements, behavior, and facial expressions. Instruction strategies must incorporate the child's primary communication methods.

Motor development includes both gross and fine motor skills and focuses on developing and/or enhancing a student's motor abilities. These skills involve large muscle movements such as walking or running, as well as the finer skills associated with hand and wrist movements.

Concept development is closely linked to general cognitive development. It involves the understanding of sizes, shapes, and functions of objects, as well as spatial and positional relationships. It includes the awareness and knowledge of one's own and another's body, an understanding of the body parts, of their movement capabilities, and of body part relationships.

Concept development also incorporates an understanding of and knowledge about the environment. For example, a child who is deaf-blind may not understand the concept of a "multistory" building without specific instruction. He may know that he's walked up a flight of stairs, but does he understand that he is "above" the hallway he just was in? Does he know that there may be several stories still above him?

Sensory development optimizes a student's ability to utilize the senses of residual sight and hearing, as well as the tactile, olfactory, and kinesthetic senses. Most students who are deaf-blind have residual hearing and/or sight, and instruction can be provided to help them learn to use this sensory information to understand and interpret information they are gathering through their senses. It is important to teach the child to interpret sensory information, assisting him or her to use this information for purposeful movement.

Orientation skills enable the student to use sensory information to move purposefully in the environment. Orientation skills instruction is designed to teach the student to use environmental cues (e.g., sounds, smells, and visual or tactile stimuli) to provide information about the present location and information about this location relative to other locales. For example, a child may learn to recognize that she is in the kitchen from the smell of coffee brewing or the living room because of the sensation of the carpet beneath her feet. This information enhances her understanding about the environment and how to move within it.

Mobility skills incorporate those O&M techniques that promote movement through the environment with safety and ease. These skills include walking with another person (guided travel), self-protection skills, and cane travel. For some, these also include the use of dog guides and electronic travel aids. For young children, these mobility skills will include early purposeful movements such as crawling and walking.

Evaluation

All goals and objectives in the IEP should have stated criteria so team members can evaluate the child's progress and the effectiveness of the instructional strategies. It is essential that team members understand IEP goals and objectives and the criteria established for each. All strategies implemented into a child's educational program must be evaluated for effectiveness and changed as necessary.

The Basics of Mobility Skills

Numerous curricula discuss mobility skills and techniques that are appropriate for students who are deaf-blind (see resource list). These skills and techniques provide methods of movement through the environment that make the child feel safe and able to participate. Basic information is presented in order to provide an overview of the different types of mobility skills and a better understanding of the purpose of each skill. For additional information, it is necessary to consult with an O&M specialist who can help to refine and individualize specific mobility skills appropriate for a particular child, develop individualized instructional programs, and recommend additional resource information.

Guided Travel

Many refer to the mobility technique involved in walking with another person as "Sighted Guide Travel." However, it is not necessary to be sighted to be an effective guide, and, therefore, the terms "Guided Travel" and "Human Guide" are also used. Using this technique, the deaf-blind child maintains a constant grip on the guide's arm (figure 1) while following the guide around obstacles as they travel through the environment. To maintain a grip that allows active participation in travel, the child must grasp the guide's arm so the thumb is placed on the outside, with the remaining fingers gripping the inside of the arm (figure 2). The child is half a step behind and to the side of the guide, allowing the guide to give "cues" about the environment through arm movements, such as cues to indicate they are approaching stairs, doors, or narrow spaces. The guide can move the guiding arm behind his or her back to indicate that they are approaching a narrow space and must walk single file. Other cues can be given to indicate stairs and doors.

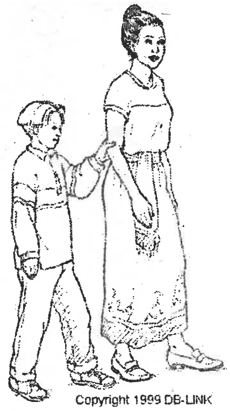


Figure 1

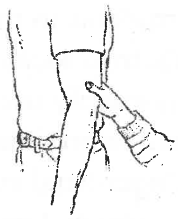


Figure 2

Cues need to fit each child's communication and learning styles. For example, children who are blind will learn that the cue for "stairs" involves a pause from the guide when they have arrived at the base of the stairs. Children who are deaf-blind may find it helpful to enhance this cue by having the guide sign "stairs" and pause as they approach the stair case. Some children find it helpful to locate the stair railing before ascending or descending. A common adaptation for smaller students to the "basic" guided travel technique is to have the student grasp the guide's extended fingers, wrist, or forearm rather than maintaining a grip above the elbow (figure 3). Effective guided travel involves a partnership between guide and child with both participants actively involved.

Figure 3

Protective Techniques

Protective techniques allow students to travel independently, yet safely, in familiar places, enabling them to locate objects while protecting their bodies. Protection skills are primarily used in familiar indoor environments and are designed to provide information about the environment during travel. Upper hand and forearm protection skills (figure 4) in which the arm is bent and held across the body at shoulder height, parallel to the floor, with the palm facing outward and the fingertips extending beyond the opposite shoulder, will provide protection from objects the student may contact at head and chest level.

Figure 4

Lower body protection (figure 5) with the arm extended down and held diagonally across the body, provides protection from obstacles at waist to upper leg level. These two techniques are sometimes used together, but they can be fatiguing. Typically, neither technique is used continually, but rather is employed as needed. For example, an individual may use trailing skills (see "trailing" below) while walking down a familiar hallway and use the forearm protection technique only near the end of the hall because he knows that there is a door that is often left open and he wants to locate it without injury.

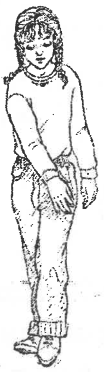
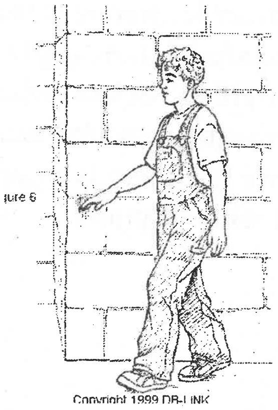


Figure 5

Trailing

While trailing, a student will extend the arm at about 45 degrees, holding the arm to the side and slightly in front of the body while maintaining contact with a surface, such as a wall. This technique (figure 6) can provide a student with a method of maintaining alignment. It also provides some protection during travel, as well as some information about the environment. This skill can be used in a variety of situations. Examples include traveling down hallways while looking for a specific object such as a door, or when a student wants to achieve a straighter line of travel to maintain orientation, or while traveling along the outside of a building while locating a way in. Trailing is also sometimes used along with a mobility device, or in conjunction with upper hand and forearm protection (figure 7).



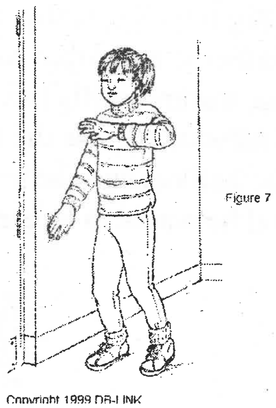


Figure 6 Figure 7

Mobility Devices

There are many mobility devices that can, when properly used, provide a student with the means for independent, safe, efficient travel. The most commonly recognized mobility device is the long white cane. Many other mobility devices are also available, including adapted cane devices. Mobility devices serve as an "extension" of the user's arm(s), hand(s), and fingers, and provide protection from obstacles while allowing access to needed information about the environment. There are many theories about the selection of mobility devices, on the best times to begin instruction, and the skills necessary to warrant instruction with a particular device. It is vital that the student's team work closely with an O&M specialist in making decisions regarding the use of mobility devices.

Dog Guides

Some individuals who are deaf-blind prefer to use dog guides rather than canes. Dog guide use is taught at special dog guide schools. Most of the schools work primarily with adults who are blind or visually impaired, but there are several that offer their services to individuals who are deaf-blind as well. Most training programs provided at the schools involve four or more weeks of instruction, with many providing follow-up instruction in the student's home environment. It is important to remember that an individual who chooses to use a dog guide still maintains responsibility for his or her own travel. The dog does not assume responsibility for orientation, nor does it make decisions about safety. Most dog guide schools require that their students be skilled travelers before being accepted into the training program. Individuals who are considering a dog guide must also understand that there are additional responsibilities in caring for their dog, including the daily feeding, grooming, and toileting issues. Most dog guide schools prefer to admit only students who are past high school age, although some do work with younger students.

Electronic Travel Aids

Electronic Travel Aids (ETAs) are portable devices that emit sonar or laser signals that are reflected back to the user during travel, and are converted to auditory and/or tactile signals. The devices are hand held, or chest, head, wheelchair, or cane mounted, and usually serve to provide supplementary information during travel. Individuals using ETAs can learn to interpret information they receive from the device about obstacles that may be in their direct path, about "openings" in hallways, and about drop-offs or inclines in the travel surface. They may also be used to enhance trailing abilities.

Wheelchair Mobility

Any O&M program for students using wheelchairs must be highly individualized and must take into account the student's residual senses, his or her ability to operate a chair with one hand, and the potential use of a motorized wheelchair. In addition to the O&M specialist, the student's physical therapist and occupational therapist must be actively involved in all decisions regarding mobility for wheelchair users. Some general considerations for O&M instruction for students who are wheelchair users are presented here:

- Students who are able to operate the chair with one hand can be taught modified guided travel techniques. These techniques will allow them to gather additional information during travel.

- Some wheelchairs can be adapted by adding an extended "bumper" that will serve as an extension of the wheelchair, and act as a mobility device.

- Adding foam to the front of the chair can serve as additional padding to lessen the impact when detecting obstacles with the chair.

- Trailing skills can be utilized while traveling in a wheelchair. Students who operate their chairs with one hand can trail using the other. For students not able to operate the chair with one hand, "curb feelers" can be mounted on the side of the wheelchair. The student can be taught to trail using the curb feelers. Even when someone is pushing the chair, trailing can be used so that the student can gain information about the environment, thereby enhancing his or her ability to maintain orientation.

- The student's physical therapist and occupational therapist can help teach the student to open and close doors.

- Some students are able to use a long cane while using a wheelchair. This is true for students who are able to operate the chair using one hand, and for those who use motorized wheelchairs. Most often, the cane chosen for use with a wheelchair is longer than a typical cane.

- Instruction in interpreting information about the travel surface is important. The student can learn to discern the way different surfaces "feel" while traveling over a variety of surfaces such as, the gravel, grass, or sidewalks. This skill provides general environmental orientation.

- Using the student's communication mode or system, the person who is pushing the chair (in effect, "guiding" the student) should use strategies that encourage active student participation during travel.

The student has a right to know where he or she is, where he or she is going, and what the environment is like. This information will encourage the student to actively learn from the environment rather than simply "sit" during travel.

SUMMARY

For some students an interpreter is critical for teaching orientation and mobility (O&M) for numerous reasons, including the following:

- Clear and convenient communication is essential for establishing rapport. In turn, building rapport is basic to establishing a sense of trust and confidence for the student who is learning O&M skills.
- The aim of O&M instruction is safe and independent movement, and maintaining safety depends on the accurate communication of information.
- Students who are receiving O&M instruction may have a variety of questions and concerns. It is difficult to address their concerns or to be confidential when communication is impaired.

SELF-CHECK

1. Write notes on :

(a) First school for the Deaf in India
(b) College education for the Deaf in India
(c) A.G. Bell
(d) de L'Epee
(e) Thomas Gallaudet

2. Write the importance of the following :

(a) Year 1981 (b) Tear 1995 (c) Year 1885

3. Write the long form of the following Institutes

(a) AYJNIHH (b) NCERT (c) RCI
(d) NPE

ASSIGNMENTS/ACTIVITIES

How do teachers, O&M instructors, and others work with interpreters during O&M instruction?

- They all work as a team.
- The O&M instructor needs to prepare the interpreter by teaching him or her O&M concepts and techniques, including sighted guide and basic cane techniques.
- The O&M instructor retains his or her teaching role; the interpreter works to make things clear; and the two consult with each other frequently. The O&M instructor checks the interpreters sighted guide techniques and interpretation and

provides the student who is deaf-blind with tactile experiences as often as possible.

- Goals and methods need to be modified during instruction as all members of the team refine their methods of communication and see how the student is progressing.
- Because working with an interpreter may be a slow process, patience is essential.
- Success depends largely on the student and the rapport and quality of communication between the student and the professionals with whom the student is working.

Practical Strategies For Families and Team Members

- Provide opportunities for your child or student to explore all areas of his or her environment, particularly the home. Help the child locate stationary landmarks that provide reference points. For example, a child may know that he is in his bedroom after locating his dresser with the "special" handles. Be sure to allow him to find this dresser so he will know when he is in the bedroom.
- Let your child or student experience a variety of surfaces such as carpet, tiled floors, vinyl flooring, grass, sidewalks, sand, uneven pavement, etc.
- Allow your child or student to participate fully in activities. For example, if he wants to play with toys, help him go to the

place where the toys are located and select the toy that interests him. Travel back to the play area together. This process allows him to understand his environment more completely, as compared to having the toys simply brought to him.

- Make full use of "reference points," those clues that help us know where we are. We have all experienced being lost in an unfamiliar city, only to become "reoriented" once we locate a familiar landmark. Similarly, children who are deaf-blind need to learn to use reference points to help them stay oriented in their environment. Reference points can be auditory, tactile, olfactory, or visual.
- Encourage your child or student to travel as independently as possible. If he can walk independently, allow him to do so. If he is learning to walk with a guide, don't hold his hand and pull him along with you. If he is capable of reaching out to locate a desired toy, don't allow it to "magically appear" by bringing it to him.
- Be sure lighting is adequate for children who have residual vision. The use of high contrasts can also assist some students. For example, using a light rug on a dark carpet may help the child recognize a transition to a different room.
- Make use of physical boundaries so the child can better understand his surroundings. It is much easier to comprehend a

play area bounded by wall dividers or bookshelves than an arbitrary space in the middle of a large room.

- Provide opportunities for the child or student to solve problems on his or her own. Refrain from rescuing him or her prematurely.
- Help a child or student associate familiar toys and objects with the environments in which they may be used. For example, show him the washcloth before walking to the bathroom for a bath, or the ball before traveling to the school gymnasium.

POINTS FOR DISCUSSION/CLARIFICATION

After going through the unit you may like to have further discussion on some points and clarification. Note down those points:-

Points for Discussion

Points for Clarification

2.17 REFERENCES

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INTRODUCTION TO SENSORY DISABILITIES

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