Teacher training manual 2

Teaching children with Visual, Hearing and Physical Impairment

Kigali, January 2010

MINEDUC  Unicef  HANDICAP INTERNATIONAL
Vivre debout  PROGRAMME RWANDA
**Introduction to this Manual**

After the first Manual where teachers were introduced with general information about Special and Inclusive Education, experts from different fields get together in order to generate another teacher training resource that will give more details on different types of disabilities.

The second Manual composes of three main parts:

- Visual Impairment
- Hearing Impairment
- Physical Impairment

In each part, there are most important information about identification of different types of impairments, causes, practical advices for teaching and other important details that will enable teachers to improve their methods and approaches while working with children with special needs.

This manual puts emphasis on participative and practical approach. Trainers should try their best to enhance the trainees’ involvement.

Some concepts are no longer new because the manual is a logical complement of the first one. Hence, the trainees should apply their already acquired skills and effectively foster the new contents.

We wish you a result oriented, collaborative and active training!
Authors:

KOBUSINGYE Mary, BA in Management of Special Education in developing Countries.

MWEBAZE K. Ignatius, Diploma in Special Education (Hearing Impairment).

MURENZI Vincent, BA in Education
Certificate in Special Education (UNISE).

Peer-reviewer:

MBABAZI Christine, Diploma in Special Education (Mental Retardation).

Technical Advisor:

Jelena ILLIC, MA in Special Education and Rehabilitation.

Re-reading:

Lydie NYIRAHABYAMBERE, BA in Development Studies with specification in planning.
Contents:

Introduction to this manual ..................................................................................2

Part one: Visual Impairment. .................................................................................4

Unit one  Introduction
Unit two  Classification of visual Impairment
Unit three  Anatomy of the eye and its functions
Unit four  Different eye conditions
Unit five  Refractive errors
Unit six  Teaching children with visual impairments
Unit seven  Introduction to Braille

Part two: Hearing Impairment ..............................................................................24

Unit one  Identification of children with hearing impairment
Unit two  Causes of hearing loss
Unit three  Assessing hearing impaired children
Unit four  Appropriate intervention
Unit five  Modules and means of communication
Unit six  Sound and hearing loss
Unit seven  Types of personal hearing aids
Unit eight  Practical advices for teaching children with hearing impairment
Unit nine  Sign language

Part three: Physical Impairment ...........................................................................39

Unit one  Introduction
Unit two  Children with mobility problems
Unit three  Cerebral Palsy
Unit four  Muscular Dystrophy
Unit five  Spina Bifida
Unit six  Teaching children with physical impairment
Unit seven  Use of assistive devices

References .............................................................................................................52
PART ONE: VISUAL IMPAIRMENT

Aim

To enable participants to discuss aspects of understanding and teaching learners who have visual impairment

Outcomes

By the end of the session, participants should:

- Understand the implications for learning of some of the visual difficulties faced by some children
- Be able to find out more information about a variety of eye conditions
- Know some of the issues you need to take into consideration when teaching pupils with visual impairments

Unit One: Introduction

The human eye is like a camera that corrects, focuses, and transmits light through the lens to create an image on its surroundings. In a camera, the image is created on the film or an image sensor. In the eye the image is created on the retina, a thin layer of light sensitive tissue at the back of the eye.

Visual impairment is a term used to describe any kind of vision loss, whether one cannot see or one has partial vision loss (an umbrella that encompasses all types of vision losses). Visual impairment can be:

- Any abnormality/ problem in vision
- Any factor that can cause one to see less
- Inability of the eye/ brain or both to visualise things in the normal way

Learners with visual impairment –have low vision or blind require specialised assistance to develop the skills and knowledge needed to function in society, because they are not able to learn by watching others, these children need instructions from their teachers and their families to develop skills in a variety of academic and non-academic areas which include;

- Reading using Braille and other systems
- Use of electronic technology
- Adaptations Person hygiene techniques
- Selection and care of clothing
- Meal planning and food preparation
- Housekeeping skills
- Knowledge of human sexuality
Some signs of visual impairment

- Absence of eye balls
- Abnormal size of the eye ball, too big or too small
- Appearance of the eye, discoloration of the eyes, red eyes etc
- Complaints about blurred / unclear vision
- Pus/abnormal fluids from the eye
- Itching
- Improper developmental of the eye lashes

(NB the list can be enriched)

Unit Two: Classification of visual impairment

Visual impairment can be classified in many different ways but teachers need to understand the educational implications for the child. The child may experience:

- Problems reading the notes from the blackboard or scanning information quickly
- Distortion of depth perception: what is being seen and perceived
- Problems in maintaining and changing focus at near and far distances
- Visual discomfort and fatigues;
  and consequently may require additional time to process visual information. It is difficult to generalise about the implications of visual impairment as two pupils with similar visual condition and recorded visual acuity level may have totally different needs. The way vision is used may be influenced by the following:

- The age of the onset of the eye conditions
- The amount of early support by a specialist teacher of visual impairment or teacher expectations
- Parental and family attitudes
- Motivation, personality factors and the social and emotional security of the child
- Past experiences – negative and positive
Causes of visual impairment

1. Parental problems
   - Poor feeding of the pregnant mothers
   - Foods insufficient in energy, proteins, vitamins and mineral salts
   - Alcohol, smoking, strong drugs so cause visual problems
   - Cultural practices where women are denied from eating some nutritious foods
   - Premature births that result into babies born with premature retina

2. Birth problems
   - Use of tools
   - Difficulty birth where the baby may delay to start breathing which is dangerous to the brain
   - Malnutrition of the child from birth
   - Lack of a balanced diet especially if it is insufficient in vitamin A, a condition where night blindness or dry eyes may occur

3. Injuries
   - Accidents which may affect different parts of the eye
   - Brain damage due to injuries/disease eg cerebral palsy
   - Chemicals/poison in water, air and food plus use of traditional herbs
   - Pregnant mothers are prevented from working in chemical shops
   - Poor hygiene related to poverty and ignorance

4. Refractive errors
   Hypermetropia, hyperopia or farsightedness, myopia or near sightedness, and nystigmas
   Retinal diseases/conditions
   Retinitis pigmentosa – peripheral defects

5. Diseases / conditions
   German measles
   Meningitis
   Cerebral malaria
   Glaucoma
   Cataract
   Malaria

6. Old age. As people grow old, they tend to become susceptible to some diseases such as cataract, long-sightedness
Unit three: Anatomy of the eye and its functions

Rays of light come to our eyes from different sources such as the sun, light bulbs, fire. Light rays travel through space until they hit an object such as a dog or a house. If the object is opaque, the light is either absorbed or reflected. The colour we see is determined by the colour of the light bands reflected from the object.

If the light rays hit something that is transparent such as water, glass or the cornea of the eye, the light rays pass through it and their path is bent or refracted. Refraction is the bending of light as it passes from one transparent substance to another.

If a person looking at an object has normal vision, the light rays reflected by the object are bent by the cornea and lens until they become to a single focal point on the retina. If the image is blurred, there is probably something wrong with the way the light was bent or reflected, is called a reflective error and could be corrected with glasses. The reflective error may be due to the shape of the cornea, the power of the lens, or the length of the eyeball. If all three of these factors are accurate, the light rays will be focused on the retina probably and the person will see clearly. However, if there is some variation in any one factor such as the cornea being too steep or too flat or the eyeball is shorter or longer than normal, the person may have a focusing problem.

Accommodation is the process the eye uses to focus for new vision. Binoculars and cameras can’t charge their viewing distance without a dial or lever being turned. The dial in the eye is a ring shaped muscle located around the edge of the lens inside the eye. This muscle is part of the ciliary body. When the muscle contracts, it makes the ring smaller, which makes the lens become thicker. The thicker the lens has more power and can bring close up objects into focus for clear viewing. When the ciliary muscle relaxes, the lens becomes thinner, and the person can view distant objects clearly.

At the same time the eyes bring an object into focus, they turn in or converge so both eyes are looking at the objet. Convergence and accommodation work hand-in – hand so the eyes work together, and see objects clearly.

Activity 1 :
1. Imagine you are a learner with visual impairment who is excluded in school activities. Discuss with a friend some of the feelings which you might have :
2. Towards yourself
3. Towards your teachers.
Unit Four: Different eye conditions

Cataract

Inside the pupil of the eye, there is a clear lens that focuses light entering the eye onto the retina at the back of the eye. The lens is made of protein and water. During the aging period, the protein may begin to clump together and start to cloud some parts of the lens. This cloud that forms is called a cataract. It will block the light from reaching the retina. Cataracts develop at a very slow pace, during this period they do not cause any pain, redness, or tearing eye. Cataracts cannot be prevented. At the beginning they are small and do not affect the vision much. However, with time the cataracts may become large and thick and will have to be removed surgically.

Causes

Aging is the main cause of cataract. At the age of 55-64, there is 50% chance of a person to develop a cataract though there might not be vision problem until age 65. About 50% have lost some vision. Cataracts seem to develop earlier in people who live at high altitudes or who spend much time on the sun. Recent studies have shown that diabetics and users of steroids, smokers are at a high of developing cataracts.

Symptoms

The main symptom of cataract is

- a painless decrease in vision, may have difficulty in reading,
- Sensitivity to glare and light may increase,
- Problems in driving at night, vision problems in bright sunlight
- Problems in distinguishing colours
- May have distortion or ghost images in either eye
- May experience double or multiple vision

However, these symptoms may go away as the cataract grows. Occasionally babies are born with cataracts. They are known as congenital contracts. A traumatic cataract can form as a result of injury to the eye or inflammation of the eye.

About Diabetic conditions
Diabetes can start in childhood, but more often begins in later life. It can cause complications which affect different parts of the body, the eye being one of them. There are two different types of diabetes mellitus:

**Type 1 diabetes**: this type of diabetes commonly occurs before the age of 30 and is the result of the body producing little or no insulin. Type 1 diabetes is controlled by insulin injections.

**Type 2 diabetes**: this type of diabetes commonly occurs after the age of 40. In this type of diabetes the body does produce some insulin, although the amount is either not sufficient or the body is not able to make proper use of it. Type 2 diabetes is generally controlled by diet or tablets, although some people in this group will use insulin injections.

### Activity 2:
1. How do cataracts develop into one's eye(s)
2. What are the main symptoms of cataract?
3. How does diabetes affect one’s eyes

### Importance of annual eye examinations

If you have diabetes this does not necessarily mean that your sight will be affected, but there is a higher risk. If your diabetes is well controlled then you are less likely to have problems, or they may be less serious. However, if there are complications that affect the eyes then this may result in loss of sight. Most sight loss due to diabetes can be prevented, but it is **vital that it is diagnosed early**. This can only be detected by a detailed examination of the eye. Therefore, regular, annual eye examinations are extremely important, as you may not realize that there is anything wrong with your eyes until it is too late.

### How the eye works

In understanding how diabetes can affect the eye, it is worth looking at how the eye works.

Your eye has a lens and an aperture (opening) at the front known as the pupil, which adjusts to bring objects into focus on the retina at the back of the eye. The retina is made up of a delicate tissue that is sensitive to light, rather like the film in a camera. It also contains a fine network of small blood vessels.

At the centre of the retina is the macula, which is a small area about the size of a pinhead. This is the most highly specialized part of the retina and is vital because it allows you to see fine detail for activities such as reading and writing and also to recognize colours. The other parts of the retina give you side vision (peripheral...
vision). Filling the space in front of the retina is a clear jelly-like substance called the vitreous gel.

How diabetes affects the eye

Diabetes can affect the eye in a number of ways. The most serious eye condition associated with diabetes involves the retina, and, more specifically, the network of blood vessels lying within it. The name of this condition is diabetic retinopathy.

Diabetic retinopathy

Diabetic retinopathy is usually graded according to how severe it is. The three main stages are described below.

Background diabetic retinopathy

This condition is very common in people who have had diabetes for a long time. Your vision will be normal with no threat to your sight. At this stage the blood vessels in the retina are only very mildly affected, they may bulge slightly (microaneurysm) and may leak blood (haemorrhages) or fluid (exudates). The macula area of the retina mentioned earlier remains unaffected.

Maculopathy

With time, if the background diabetic retinopathy becomes more severe, the macula area may become involved. This is called maculopathy. If this happens, your central vision will gradually get worse. You may find it difficult to recognise people's faces in the distance or to see detail such as small print. The amount of central vision that is lost varies from person to person. However, the vision that allows you to get around at home and outside (peripheral vision) will be preserved. Maculopathy is the main cause of loss of vision and may occur gradually but progressively. It is rare for someone with maculopathy to lose all their sight.

Proliferative diabetic retinopathy

As the eye condition progresses, it can sometimes cause the blood vessels in the retina to become blocked. If this happens then new blood vessels form in the eye. This is called proliferative diabetic retinopathy, and is nature's way of trying to repair the damage so that the retina has a new blood supply. Unfortunately, these new blood vessels are weak. They are also in the wrong place - growing on the surface of the retina and into the vitreous gel. As a result, these blood vessels can bleed very easily and cause scar tissue to form in the eye. The scarring pulls and distorts the retina. When the retina is pulled out of position this is called retinal detachment.
Proliferative retinopathy is rarer than background retinopathy. The new blood vessels will rarely affect your vision, but their consequences, such as bleeding or retinal detachment may cause your vision to get worse. Visual loss in this case is often sudden and severe.

Without treatment, total loss of vision may happen in proliferative retinopathy. With treatment, sight-threatening diabetic problems can be prevented if caught early enough. However, laser treatment will not restore vision already lost.

GLAUCOMA

Glaucosa is a group of disease associated with increased pressure in the eye. This pressure is called intraocular or (IOP). Although glaucoma can’t be prevented, blindness resulting from glaucoma can. Glaucosa is 4 times more likely to cause blindness in blacks than in whites (45-64). Vision loss from glaucoma can be prevented if caught in time. If a person has a relative with glaucoma, very nearsighted, or has diabetes, he or she is at high risk for glaucoma. Glaucosa occurs when increased intraocular pressure damages optic nerve, causing blind sports to develop. About 90% of glaucoma cases are chronic, meaning pressure builds up undetected for years. Acute glaucoma is caused by a sudden increase in eye pressure. This condition is rare and tends to be hereditary. It seems to primarily affect people who are farsighted.

Types of Glaucosa

Open angle glaucoma: Fluid normally flows through the pupil of the eye into the anterior chamber. It leaves the anterior chamber at the angle where the iris and cornea meet. In open-angle glaucoma, the angle is open, but fluid passes too slowly through the filtration area to the drainage canal. As the fluids builds up, pressure rises and causes optic nerve damage which result in vision loss.

In closed-angle glaucoma, the angle between the cornea and iris becomes blocked by part of the iris. Fluid cannot leave the eye and pressure builds quickly. The patient may experience pain and nausea along with redness of the eyes and blurred vision. This needs immediate medical attention otherwise blindness can occur in a day or two.

Normal (low) tension glaucoma: In this type of glaucoma the optic nerve damage occurs although the patient’s intraocular pressure is considered within normal limits.

Childhood glaucoma: This is rare and is thought to be hereditary. It may start in infancy, childhood, or adolescence. If left untreated it can cause blindness.

Congenital glaucoma: this appears soon after birth or in the first year. Symptoms may include tearing, light sensitivity, and cloudiness of the cornea, is more common in boys and can affect one or both eyes.

Glaucosa can either be primary or secondary. The primary condition is attributed to no known cause, but secondary condition can be traced to some cause such as previous injury or illness. Secondary glaucoma usually develops as results of other medical conditions, ie eye surgery, advanced cataract, eye tumours, or eye inflammations. Corticosteroid drugs can cause glaucoma.
Pigmentary glaucoma: This occurs because pigment from the iris breaks off and blocks the drainage areas. Neovascular glaucoma is associated with diabetes.

Symptoms

Many people do not experience the symptoms of glaucoma until loss of vision starts, as the optic fibres are damaged; blind spots begin to appear in the vision

- Loss of peripheral vision
- Inability to adjust the eye to darkened rooms
- Difficulty of focusing on close work
- Rainbow colored rings or halos around lights
- And need to change eyeglass prescriptions frequently

TRACHOMA

Definition: Trachoma is an infectious eye disease caused by infection with the bacteria Chlamydia trachomatis. Trachoma is a major cause of blindness in the world, found primarily in rural settings in developing countries.

Trachoma affects the conjunctiva and cornea of the eye. It is spread by direct contact of eye, nose, and throat secretions from affected individuals, or contact with towels or washcloths that have come into contact with secretions. Children are most susceptible to the infection, with blinding effects of the disease often not known until adulthood.

Symptoms of trachoma are similar to those of conjunctivitis, or pink eye, including mild itching and irritation of the eye and discharge from the eye containing mucus or pus. As the disease progresses, symptoms may include light sensitivity, blurred vision and eye pain.

Blinding trachoma results from episodes of reinfection, causing the conjunctiva to be continuously inflamed. If reinfection does not occur, inflammation will gradually subside. However, if not treated properly with oral antibiotics, trachoma may worsen and cause blindness, due primarily to scarring of the cornea. In some cases, surgery becomes necessary to repair eyelid deformities

Activity 3:
- List down the different types of Glaucoma
- Briefly describe how it affects a persons eye
- Why should teachers have knowledge of different eye conditions?
- What is the main cause of glaucoma

Eye problems in albinism result from abnormal development of the eye because of lack of pigment which often includes:
• Nystagmus: regular horizontal back and forth movement of the eyes
• Strabismus: muscle imbalance of the eyes, “crossed eyes” (esotropia), “lazy eye” or an eye that deviates out (exotropia)
• Photophobia: sensitivity to bright light and glare
• People with albinism may be either far-sighted or near-sighted and usually have astigmatism
• Foveal hypoplasia: the retina, the surface inside the eye that receives light, does not develop normally before birth and in infancy
• Optic nerve misrouting: the nerve signals from the retina to the brain do not follow the usual nerve routes
• The iris, the colored area in the center of the eye, has little to no pigment to screen out stray light coming into the eye. (Light normally enters the eye only through the pupil, the dark opening in the center of the iris, but in albinism light can pass through the iris as well.)

For the most part, treatment of the eye conditions consists of visual rehabilitation. Surgery to correct strabismus may improve the appearance of the eyes. However, since surgery will not correct the misrouting of nerves from the eyes to the brain, surgery will not improve eyesight or fine binocular vision. In the case of esotropia or “crossed eyes,” surgery may help vision by expanding the visual field (the area that the eyes can see while looking at one point).

People with albinism are sensitive to glare, but they do not prefer to be in the dark, and they need light to see just like anyone else. Sunglasses or tinted contact lenses help outdoors. Indoors, it is important to place lights for reading or close work over a shoulder rather than in front.

Various optical aids are helpful to people with albinism and the choice of an optical aid depends on how a person uses his or her eyes in jobs, hobbies, or other usual activities. Some people do well using bifocals which have a strong reading lens, prescription reading glasses, or contact lenses. Others use hand-held magnifiers or special small telescopes and some prefer to use screen magnification products on computers.

Some people with albinism use bioptics, glasses which have small telescopes mounted on, in, or behind their regular lenses, so that one can look through either the regular lens or the telescope.

River blindness

River blindness is caused by the filarial nematode, onchocerca volvulus. The infection occurs through vector-borne transmission by the bite of female black flies of the genus simulium that bites during the day, and are found near rapid flowing rivers and streams.

• Severe itching initially in one section of body then spreading to whole body and eyes
• Skin nodules
- Urticarial (hives-like) rash
- Swelling of limbs (oedema)
- Spotty skin

Rentinitis Pigmentosa

Pigmentosa (RP) is the name given to a group of hereditary eye disorders. These disorders affect the retina, which is the light-sensitive tissue lining the back of the eye, in which the first stages of seeing take place. In RP, sight loss is gradual but progressive. It is unusual for people with RP to become totally blind as most retains some useful vision well into old age.

The retina in your eye serves a similar purpose to a film inside a camera. Light is focused by a lens at the front of the camera onto a light-sensitive film at the back, to form a picture. In a similar way, light entering your eye is focused onto a light-sensitive tissue which lines the inside of the eye at the back. This tissue is the retina.

The retina consists of two main layers, a thin one called the pigment epithelium and a thicker one, made up of many layers of cells, called the neural retina. One particular layer in this neural retina contains many millions of cells called photoreceptors, which are able to respond to light.

A few million cells called cones are concentrated in the central portion of the retina. These allow us to see fine detail and colour. Away from the central portion of the retina are about 120 million cells, which are mostly rod cells. They enable us to see when light is dim and provide peripheral (side) vision outside of the main line of sight. Peripheral vision is the sight you have out of the corner of your eye when looking straight ahead.

When light is focused onto these rods or cones, a small electrical charge is generated (the amount depends on the amount of light) and this charge passes down the optic nerve to the brain. As each of these cells receives a slightly different amount of light and sends a different electrical pulse, the brain is able to assemble a picture.
Causes of RP

It is now known that there are many different inherited problems causing RP. In all RP-related conditions however, the ability of the retina to respond to light is affected. The problem can be in many parts of the retina such as the rod or cone cells, or in the connections between the cells of the retina.

Symptoms of RP

The most common first symptom is difficulty in seeing in poor light, for example outdoors at dusk, or in a dimly lit room. A second symptom is reduction of the visual field, in which sight is lost from the sides, or from above and below. This is often referred to as tunnel vision and means that the rod cells, and some of the outer cone cells, have been affected first.

In some RP-related conditions central vision is lost first. The first signs of this are difficulty in reading print or carrying out detailed work. All RP conditions are progressive, but the speed at which deterioration takes place varies from one person to another.

In many types of RP, glare from bright lights is an increasing problem, although some people do not experience this until the more advanced stages.

RP and heredity

There are three ways in which RP can be inherited:

Autosomal dominant inheritance

This is the pattern of inheritance where RP is known to exist in a family, affecting both males and females.

The probability of RP being passed from an affected parent to a child is exactly 50 per cent.

Autosomal recessive inheritance

There will usually be no known history of RP in the family but if two carriers who show no obvious symptoms have a child, there is a 25 per cent chance that he or she will have RP.

X-linked inheritance

This is a pattern of inheritance where only males develop the disease, but female members of a family are carriers. Some carriers can develop a mild form of RP.

For example, if a man has X-linked RP, his sons will not develop RP, but all of his daughters will become carriers. These daughters will each have a 50 per cent chance of producing an affected son and a 50 per cent chance of daughters who will be carriers. This inheritance pattern is sometimes difficult to identify in a family where there have been no sons for several generations, as the faulty gene could have passed down a line of female carriers and then suddenly affect a male child.

Assignment

1. Using illustrations, explain how seeing takes place in normal human
Unit Five : Refractive Errors

What is normal vision?

In order to better understand how certain problems can affect your child's vision, it is important to understand how normal vision occurs. For children with normal vision, the following sequence takes place:

1. Light enters the eye through the cornea, the clear, dome-shaped surface that covers the front of the eye.
2. From the cornea, the light passes through the pupil. The amount of light passing through is regulated by the iris, or the colored part of your eye.
3. From there, the light then hits the lens, the transparent structure inside the eye that focuses light rays onto the retina.
4. Next, it passes through the vitreous humor, the clear, jelly-like substance that fills the center of the eye and helps to keep the eye round in shape.
5. Finally, it reaches the retina, the light-sensitive nerve layer that lines the back of the eye, where the image appears inverted.
6. The optic nerve carries signals of light, dark, and colors to the area of the brain (the visual cortex), which assembles the signals into images (our vision).

What are refractive errors?

The following are the most common refractive errors, all of which affect vision and may require corrective lenses for correction or improvement:
- **Astigmatism**
  Astigmatism is a condition in which an abnormal curvature of the cornea can cause two focal points to fall in two different locations (The light rays reach a focal point at multiple spots in front of and behind the retina) - making objects up close and at a distance appear blurry. Astigmatisms may cause eye strain and may be combined with nearsightedness or farsightedness. Astigmatism can start in childhood or in adulthood. Some symptoms include headache, eye strain, and/or fatigue. Eye rubbing, lack of interest in school, and difficulty in reading are often seen in children with astigmatism. Depending upon the severity, eyeglasses or contact lenses may be required.

![Astigmatism Image]

- **Hyperopia**
  Commonly known as **farsightedness**, hyperopia is the refractive error in which an image of a distant object becomes focused behind the retina, either because the eyeball axis is too short, or because the refractive power of the eye is too weak. This condition makes close objects appear out of focus and may cause headaches, eye strain, and/or fatigue. Squinting, eye rubbing, lack of interest in school, and difficulty in reading are often seen in children with hyperopia. This condition is uncommon in children. The glasses for hyperopia are thicker in the center, which makes the person’s eye appear larger.

- **Presbyopia**
  This is a result of aging, and is also known as «old man’s eyes » the person's natural lens hardens and is less flexible, and the person’s ability to accommodate begins to decrease. Presbyopia is sometimes confused with hyperopia. However the presbyopia eye does not posses a refractive error such as in hyperopia; it simply doesn't adjust to nearby images by increasing its refractive powers. To correct this some kind of glasses have to be used.
Eyeglasses or contact lenses may help to correct or improve Presbyopia by adjusting the focusing power to the retina.

- **Myopia**

Myopia is commonly known as **nearsightedness**. People with this particular problem see objects close to them more clearly than they see objects far away. Myopia occurs when the eyeball is too long or the cornea is too curved. In combination the lens and the cornea have too much refracting power. In this refractive error, the light rays coming to the eye are focused at a point infront of the retina instead of on the retina. Objects that are far may appear dark. Nearsightedness is usually evident at the age 6&16, and ca worsen during teen years.

For the correction of myopia concave lenses can be used. The lenses are made thinner in the centre than they are at the edges. These do not cure the cause of myopia but they bend the light rays from distant objects so they focus on the retina. People with myopia will be able to see better when they have their glasses on.

**What causes refractive errors?**

Refractive errors (myopia and hyperopia) have been found to cluster in families. A variety of inheritance patterns have been observed including dominant (one gene passed from a parent with a refractive error to a child), recessive (caused by two
genes, one inherited from each parent who may/may not have a refractive error), and multifactorial (combination of genes and environment). Refractive errors are present in a number of genetic disorders, such as Marfan syndrome and Down syndrome.

Activity 4:

1. Name some of the refractive errors you have learnt about
2. With illustrations show how each affects a person’s eyes
3. As a teacher how would prevent the incidence of the mentioned conditions/errors?

Discuss with a colleague

Unit Six: Teaching Children with Visual Impairments

Many children are visually impaired, but are fortunate enough to have the impairment corrected by glasses. But, for a small percent of the population, their impairment is so severe that it cannot be corrected. For these children, without the proper assistance, education can be a difficult process.

A child with a moderate visual disability can perform visual tasks almost like a sighted student with the use of special aids and lighting. A child with a severe visual disability may need extra time and energy to perform visual tasks, even with visual aids. A child with a profound visual disability will find it difficult to perform gross visual tasks, and detailed tasks virtually impossible.

Teaching Strategies

If a child is visually impaired but it is correctable to some degree, it is important for the teacher to place that child in a position in the classroom where the child has as much access to the blackboard as possible. Special paper with raised lines on it should be made available for the child to use. All children with visual impairments should be taught typing, and given access to a keyboard.

For visually impaired children, tasks should be made as concrete as possible. It would be difficult for a visually impaired child to visualize what the teacher means when she said 1/4 of a piece of pie during a lesson on fractions. But, if the child has manipulative in front of them, they will use their sense of touch and this will help to reinforce the concept for the child.

The classroom should also be "brailed," that is, braille labels should be placed throughout the room, and on the various pieces of furniture. The sighted students should also be made aware of how the visually impaired make use of the face of the clock for direction. This will prevent students from saying that the trash can is over there.
It may also be advantageous to have a student volunteer to read out loud to the visually impaired student. You can kill two birds with one stone here by choosing a student who may need some help working up to his potential. By having them read out loud, you can be sure that they are going over the material, and in turn, this should help his grades.

The visually impaired child should also have access to a tape recorder. In this way, he can record classroom discussions and transpose his notes into braille later on.

**Practical advice for teachers teaching learners with visual impairment**

- Speak to the class upon entering and leaving the room or site.
- Call the student with vision impairment by name if you want his/her attention.
- Seat the student away from glaring lights (e.g. by the window) and preferably in front of the class.
- Use descriptive words such as straight, forward, left, etc. in relation to the student's body orientation. Be specific in directions and avoid the use of vague terms with unusable information, such as "over there", "here", "this", etc.
- Describe, in detail, pertinent visual occurrences of the learning activities.
- Describe and tactually familiarize the student to the classroom, laboratory, equipment, supplies, materials, field sites, etc.
- Give verbal notice of room changes, special meetings, or assignments.
- Offer to read written information for a person with a visual impairment, when appropriate.
- Order the appropriate text books for the students in their preferred medium.
- Identify yourself by name; don't assume that the student who is visually impaired will recognize you by your voice even though you have met before.
- If you are asked to guide a student with a visual impairment, identify yourself, offer your services and, if accepted, offer your arm to the student's hand. Tell them if they have to step up or step down, let them know if the door is to their left or right, and warn them of possible hazards.
- Orally, let the student know if you need to move or leave or need to end a conversation.
• If a student with a visual impairment is in class, routinely check the instructional environment to be sure it is adequate and ready for use.

• When communicating with a student who has vision impairment, always identify yourself and others who are present.

• Be understanding of the slight noise made by a portable translator.

• Also use an auditory or tactile signal where a visual signal is normally used.

• It is not necessary to speak loudly to people with visual impairments.

• Always notify changes of class schedule in advance.

Classroom strategies for Regular Education Teachers who have students with visual impairments

1. It's okay to say "look" and "see." Even fully sighted people use their other senses in the context of looking at something. Visually impaired people might look at things in a different way, but "seeing" is in the perception (rather than the eye) of the beholder.

2. Audiovisual presentations and demonstrations are made accessible to severely visually impaired students by providing verbal explanations. Read what is being written on the board and/or describe what is pictured in the presentation. Allow the student time to handle tactually adapted materials. Saying "over there" and pointing to something the student can't see are not useful with a blind student. Instead, spatial directions must be given from the STUDENT'S perspective. Remember that the student's left and right are opposite yours when you are facing the student.

3. Seat or encourage the visually impaired student to come to the front of the classroom or presentation area in order to be certain that s/he hears all instruction/explanation correctly.

4. Braille materials take an exceptionally long time to order and/or prepare. Textbook committee members should be aware of this and be certain that Braille textbooks can be ordered earlier the following fall so that they can be transcribed in time. Extra time may be required for math and technical books, as Braille mathematical notation requires a unique certification that many literary Braille transcribers do not possess.

5. Classroom handouts, especially those with pictures or diagrams, also require a great deal of time to transcribe into Braille and tactile formats or verbal descriptions. Classroom teachers are wise to provide materials to be transcribed at least two weeks ahead of time, preferably on disk, as some text can be transcribed using computer translation software.

6. Expect the visually impaired student to complete the same assignments as the rest of the class. Due to alternative media, assignments may take a visually impaired student longer to complete. An average of double time for Braille or tape is a good rule of thumb. Due to time constraints it may occasionally be necessary to reduce the number of examples to be completed for class work or homework (such as in math problems), as long as the student is able to
demonstrate that s/he understands the concepts and/or skills exhibited within each example.

7. Independence is of primary importance! Be patient. Observe the student, silently encouraging independent problem-solving skills. Wait until the student asks for help and provide minimal assistance only as needed to build self-confidence and independence.

8. Avoid leaving doors and drawers ajar or chairs out from under tables and desks. Either keep furniture consistent or inform and/or involve the student in rearranging.

9. Address all students by name so that the visually impaired student can learn to associate names with voices of classmates. Address the visually impaired student by name as well, so he or she knows when he or she is being spoken to.

10. Encourage the student's use of proper posture, eye contact as much as possible and proper social etiquette. Discourage any inappropriate mannerisms to maximize the student's physical and emotional health, as well as the student's social, educational and career potential.

11. Always treat the visually impaired student equally with other students. This includes discipline and special privileges as well as involvement in extracurricular and leadership opportunities.

12. Give the visually impaired student as many opportunities to help others as to be helped by others.

13. Please don't presume that just because the student can't see and is using other learning mediums that the student is incapable. Try to allow the student to use their strengths in the areas they have to learn.

14. All students, including those with visual impairments, learn at individual rates.

Summary: As much as possible, treat the student the same as any other student and your example will encourage classmates to do the same.

**Activity 5:**

1. After undergoing this training how would you as a teacher support a child with visual impairment in a regular class/school? (Give about 8 things you would do)

2. What would you do to help your fellow teachers who did not have a chance for training?

3. How would help the whole class to welcome their peers who might have different learning modes from them?
Unit seven: Introduction to Braille (Practical activity)
PART TWO: HEARING IMPAIRMENT

Aim

The general objective of this unit is to provide professional skills for teachers to handle learners with hearing impairment in the classroom.

Outcomes

By the end of the session, participants should:

- Identify learners with hearing impairment in their classroom.
- Demonstrate knowledge and skills in teaching learners with hearing impairment.
- Demonstrate positive attitude towards learners with hearing impairment.

Unit One: Identification of a child with hearing impairment.

Hearing impairment is a broad term used to describe the complete or partial loss of hearing.

Hearing impairment can be difficult to identify early because all babies – also babies who are born deaf – will use their voice. Their gurgling or babbling will often be synchronized with their caregivers as a result of facial expression, body tension and movement.

The greatest challenge persons with hearing impairment meet is difficulties with communication because the majority of the population focuses on oral communication methods. Communication also includes movement and facial expression, as well as sound. It is therefore important that parents, caregivers, and teachers communicate in ways that seem natural, using all modes of communication: movement, facial expression, sound and words.
The following signs can indicate that child has a hearing impairment:

- Does not turn his head to sound.
- Has an unnaturally low or high picked voice.
- Depends heavily on his eyes when talking to others.
- Has not started talking by age of two.
- Does not follow what is being said.
- Finds it difficult to mix with others.
- Has a physical abnormality of ears.
- Usually pardons the teacher

**Unit Two: Causes of hearing loss**

There are different reasons that can cause hearing impairment:

- Shortage of oxygen at birth (pro-longed labor)
- Hereditary which means it is the family and affects some people in it not all of them
- The mother was ill when she was pregnant.
- Childhood illness such as mumps, measles and meningitis.
- Frequent ear infections.
- Excessive hard wax in the ear.
- Due to the accidents.
- Some medicines, particularly certain antibiotics.
- Frequent or sudden very loud noise
- Old age
Unit Three: Assessing hearing Impaired children

Children with hearing impairment are mainly assessed through public health screening or pediatric examinations. At times, children with mild or moderate hearing impairment often go unnoticed until academic performance indicates a problem of school children.

Below are some of the factors / areas to consider when assessing children with hearing impairment.

- Firstly, find out whether there are appears to be physical problem associated with the ears, if he complains of earaches, or he/she has discomfort with the ears i.e having ringing or buzzing noises. The care taken of the child should be alert for signs of discharges from the ears of excessively waxy build-up. Also colds and sore throats are accessional indicates of infections that can result in hearing impairment.

- Attention should be given to the articulation of sounds particularly when a child has poor articulation. Lack of a consonant sound from speech is often a sign of high frequency hearing loss.

- Critical observation should be given to the way child listens to a radio or television. If a child turns up the volume so high that other complains, then that child may be having hearing loss problems.

- If the child cocks his head or turns it to the speaker in an effort to hear better, then such a child too may be having hearing loss.

- If the child questions frequently, does not respond at times when spoken to in normal voice, and is reluctant to participate in oral activities if not due to shyness then that child might also be having a hearing loss.
Unit Four: Appropriate Intervention

Importance of early and appropriate intervention:

Even children with mild hearing loss can miss a lot of the information and discussions in the classrooms unless we are aware of their hearing loss and make changes to the way we teach and interact with them.

Many children with hearing impairment are inappropriately labeled as having “behavior problems” or “learning difficulties.”

It is important that we realize how difficult it is for many children who have profound hearing loss to develop a language (even sign languages) unless they have access to early intervention programs, sign language instructors, and personal tutoring (ideally by another child who has severe or profound hearing loss, but good sign language skills).

- Early intervention permits us to focus on preventing the secondary impairment rather than the remediation.

- Early intervention help us to focus on critical age (this is a period when a child is neurologically prepared to acquire basic or appropriate language skill).

- Early intervention helps development of their child’s motoric ability, their perceptual language and social aspects.

Early intervention has dramatically improved the life of hearing impaired children. Sometimes, the parents by natures of their personality, education and cultural background or life circumstance are unable to modify their behavior in order to meet the child’s special need.

There are children who have perceptual, intellectual, symbolic or other primary impairment in addition to the hearing impairment. Often with these children the particular method to which the child is exposed is not responding to its special needs.
An immediate and appropriate intervention can help in:

- Reducing the primary impairment.
- Preventing the development of secondary problems such as social, emotional behavior.
- Reducing communication problems.
- Preventing educational problems i.e. getting to know our environment.
- Ensuring that the daily needs of the child and the family are met in spite of hearing loss.

Appropriate intervention may include:

- Assessment and medication
- Guidance and canceling i.e. appropriate love and care.

The long term goal is to prepare an independent adult who should be able to live on his / her own.

There are different approaches/needs or interventions:

- Medical intervention
- Surgical intervention
- Prosthetic (educational)
- Rehabilitative.

Medical intervention

Some types of hearing loss can be treated and prevented by the use of drugs and good hygiene e.g. Measles, meningitis, mumps, otitis media.

Surgical intervention

Module ear infections and congenital abnormalities can be treated or connected through surgical means. Abnormalities include the malformation (abnormal growth)
Cochleo implant

Use of electrodes in the auditory nerves by processing the sounds (using mechanical means)

Prosthetic needs: some hearing loss can be treated by means of wearable electrons hearing aids. The use of this device may help in acquiring spoken language skills.

Rehabilitative needs: some children with hearing impairment may not benefit from corrective means mentioned above

Preparation for life

Interaction with the child should be physical, social, educational etc.

Unit Five: Modules and means of communication

There are two types of deafness:
- Post lingual deafness
- Pre-lingual deafness

Post lingual deafness:

This group consists of those children who can express themselves using speech or spoken languages but can not receive messages through the same medium of communication. They become deaf after learning how to speak, but their speech tends to deteriorate if they do not practice speaking. To receive messages they may need sign language, written activity and some times lip-reading. This group can easily be integrated when their teacher have skills in sign language and total communication with the deaf.
Pre-lingual deafness:

Another group are the children who are born completely deaf or become deaf before learning spoken language by imitation. These children use a system of gestures, signs or signs language as their natural language. In this language the sense of hearing or sounds plays no significant role in communication.

People with hearing impairment use oral or manual means of communication, or a combination of both. Oral communication includes speech (vocal communication), lip-reading and the use of residual hearing, while manual communication includes sign language and finger spelling.

Sign language and finger spelling
(Manual communication)

Sign language is the first language for children who are profoundly deaf, as well as for many children with moderate/severe and severe hearing loss. We often tend to forget that movement is the first means of communication for most children.

Every language should have their own sign language, and there are also sign language dialects within languages.

The grammar and sentence structure of sign languages are quite different from spoken languages.

Finger-spelling

All the letters of the English alphabet can be spelled using one or both hands. The “manual alphabet” or “finger spelling” is used to spell out the names of people or places that do not have sign names. There are both one-handed and two-handed alphabets for finger spelling. This is different in languages that use characters instead of letters.
Speech (Oral Communication)

Children with hearing impairment should not be forced to learn to speak. In many schools, children who are deaf spend endless hours learning to speak (and sing) while there is little focus on other subject matters. This will create, rather than remove, barriers to learning, development and participation for the children concerned. This approach is therefore no longer seen as acceptable. We must remember that a child who cannot hear well will not be able to speak clearly. This is because s/he cannot hear and mimic the words that other people say.

Lip-reading

Lip-reading is “seeing the sound of speech” – the movements of the lips and of the tongue. Facial expressions and body language are also clues for the lip-reader. It is difficult for a child – especially one that has never heard – to learn lip-reading. If the child has some hearing and is using signs as well as words, it will help her/him to learn lip-reading. Many words will not be heard properly and using signs and lip-reading helps the child to understand what has been said.

Strategies for communicating

- Face them all the time when you are speaking
- Do not cover your mouth with your hand.
- Speak clearly and not too slowly or too loudly.
- An expressive and mobile facial expression gives more clues than a passive one.
- Eye contact is very important. Do not put off if you’re watched very carefully. They can get used to the way you speak.
- There is no needs to shout or make fanny face
- Use sign language and finger spelling.
- Use lip-reading and body movements
- Drawing is another means of communication
- Use role play to express feelings and different strategies.
Unit Six: Sound and Hearing Loss

There are different types of hearing loss or degree of hearing loss.

- Mild (16-35db) a child can hear
- Moderate (36-50db)
- Moderate/severe (50-70db)
- Severe (71-90db)
- Profound 91db or greater.

**NB**: db is unit for measuring the level of sound.

**Mild** - A child with mild hearing can hear most of the words and if she or he is given a hearing aid, she/he can hear.

**Moderate** – A child with moderate hearing loss can hear with the help of hearing aid.

**Moderate/severe** - A child can pick some little sound, depending on vibrations.

**Severe** - A child can hear loud noise.

**Profound/hard of hearing** - A child can not pick any sound.

Degree of Hearing Loss and Potential Effects

The potential effects of a hearing loss depend on many factors, including degree of loss (see below), but also upon early identification and amplification, early intervention services, parent and teacher involvement, as well as when the hearing loss occurred, whether it was before or after basic communication, and if language was already developed.

The results of a hearing test are recorded on an audiogram. The vertical lines on an audiogram represent pitch or frequency. The horizontal lines represent loudness or intensity.
Hearing Devices

**Hearing Aid**: is a device designed to assist person with hearing impairment to benefit from the residual hearing they might have.

### Unit Seven: Types of Personal Hearing Aids

- **Body worn aids**: These come in a form of a compact case usually worn on the chest with accord connecting the case to an earphone and a mould in the ear.

- **Behind-the-ear (BTE) Aids.**
  This aids, often known as post-aural aids come in two parts, is a mould that is worn in the ear and a small plastic unit that fits neatly behind the ear. The two parts are connected by a small piece of plastic tubing.

- **In-the-ear aids.**
  These aids fall into two categories: All in the first category fit canal aids. Those in the first category fit entirely into the bowl of the ear and are suitable for those who have a mild or moderate hearing loss. Canal aids are smaller, fitting into ear canal, but these can only be considered for very mild losses. Both types of in the ear aids are specially molded to fit one’s own ear.
• **Eye Glass Hearing Aids**
  These Aids built in the arm of the eye glasses. They can be used either with a mould which fits into the ear in the normal way or with a vibrator which rests on the mastoid bone behind the ear.

Hearing aid is composed of four main components:

• **MICROPHONE:** Is a device which converts sound energy into electrical impulses, which are then processed by the hearing mechanism.

• **THE AMPLIFIER:** Increases the sound signals that are picked up by the microphone.

• **THE RECEIVER:** Ear converts the amplified electrical energy into sound waves ready for delivery to the ear.

• **THE EAR MOULD:** Play a very important role as a constituent part of a wearable hearing aid. Its roles are:
  Linking the hearing aid to the user.
  Conveying sound from the transducer of the hearing aid (**the receiver**) to the external ear.

**Unit Eight: Practical advices for teaching children with hearing impairment**

The following are some of the methods used in teaching children with hearing impairment:

• Group discussion
• Peer tutoring
• Demonstrations
• Dramatizing
• Discovery approach
• Experiments
Partial hearing loss or deafness does not affect a person’s intellectual capacity or ability to learn. However, children who are either hard of hearing or deaf will generally require some form of individual attention – offered in an inclusive setting - in order to receive an adequate education. Such services may include:

- Early intervention
- Sign language education
- Speech, language, and auditory training from a specialist
- Amplification systems – including hearing aids
- Services of an interpreter for those students who use a sign language as their first language
- Favorable seating in the class to facilitate lip-reading
- Captioned films, videos and DVDs
- Instruction for teachers, parents and peers in alternative communication methods, such as sign language
- Consistent and conscious use of visible communication modes (such as sign language, finger spelling, and cued speech) and/or amplification and aural/oral training
- Guidance and counseling - it is difficult for many children to cope with the social marginalization and exclusion a hearing impairment often leads to unless they have friends with hearing impairment, or their friends who can hear are able to communicate in a sign language.

**Sitting arrangements**

Organize the classroom so that all the children are sitting in a U shape. This way the children can see each other, which will make it easier for children with hearing impairment to use sign language, read lips and understand mimics, thereby making it possible to participate more actively in discussions and classroom activities.

Spend some time giving face-to-face instruction, since group situations can be quite challenging for children with hearing impairment.

Look at the child (with hearing impairment) while speaking to her/him.

- Speak slowly and clearly, but not too loud.
- Use short, simple, and clear sentences.
- Be consistent in use of language.
- Use clear mimics and gestures.
- Ask the child (if s/he has an oral language) to repeat what s/he has understood.
- Write down key words of information given during the class and give it to the child at the end of every day.

Work together with an audiologist (if available) to teach and encourage the child to use her/his residual hearing to the maximum extent possible, even if the preferred means of communication is sign language (manual communication).

- Reduce all unnecessary noise, as multiple sources of sound will make it more difficult for the child to use her/his residual hearing. This is also important if the child is using a hearing aid (amplification).
- If some of the classrooms in the school are noisier than others (noise from busy roads, airports or factories), the school should be flexible and move the class who
has children with hearing impairment (as well as classes who have children with visual impairment or other disabilities) to a less noisy classroom.
- Be flexible with time, as most children with hearing impairment (both deaf and hard of hearing) will struggle to understand everything that goes on in the classroom (as a result of their hearing loss).
- Focus more on content than on grammar when assessing the writing of children who primarily use sign language for communication. Because the grammar of sign languages is very different from written languages, these children are in fact writing in a "second" language.

Please take into consideration that:

- Facial hair - beards and moustaches (worn by teachers) may affect the ability of children with hearing impairment to read lip movement and understand facial mimics.
- Face covering - veils covering eyes, eye brows, nose, mouth and cheeks (worn by teachers and fellow students), will affect the ability of children with hearing impairment to read lips and understand mimics.
- The majority of children who are deaf (profound hearing loss) are born to hearing parents. The school should therefore also attempt to provide instruction for parents on implications of deafness within the family.
- A child who is deaf may need more time to learn than other children. This is because s/he must learn to read and write in a “second” language – a language that is quite different from her/ his first language.
- A child who is hard of hearing may also need more time to learn than other children, as s/he will not always be able to hear the teacher’s voice and what the other children talk about in the classroom. Therefore, much of the information given during the lessons will be lost.
Unit Nine: Sign language

One-handed English Finger-spelling Alphabet
Two-handed Finger spelling Alphabet

a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
PART THREE: PHYSICAL IMPAIRMENTS

Aim
To enable participants to discuss aspects of understanding and teaching learners who have physical impairment.

Outcomes
By the end of the session, participants should:

- Understand most common causes of physical impairment and difficulties faced by children.
- Demonstrate knowledge and skills in teaching learners with physical impairment.
- Demonstrate positive attitude towards learners with physical impairment.

Unit one: Introduction

Physical impairment is any disability which limits the physical function of limbs, fine or gross motor ability. Such limitations appear in different ways but the common ones are: Partial or total paralysis or traumatic brain injury, Stroke, Cerebral palsy, Muscular dystrophy, Multiple sclerosis, Arthritis, Amputation, and Carpal tunnel syndrome. By the same token, medical conditions and disorders such as cancer, cystic fibrosis, HIV AIDS, active cycle cell disease, diabetes and respiratory cardiac disease may consequently impair strength, speed, endurance, coordination, manual dexterity, and overall mobility. Not only the physical limitations are affecting mobility but also they limit manipulations of materials, such as pen and paper, legibility of penmanship and ability to sit for long periods of time are additional manifestations of physical impairments.

Physical impairment can be defined as a dysfunction of the musculoskeletal and/or neurological body systems, which affects the functional ability of a student to move or coordinate movement.
Physical impairment is recognized as:

- musculoskeletal conditions - involving the joints, limbs and associated muscles and/or
- neurological conditions - involving the central nervous system i.e. brain, spinal cord or peripheral nerves which affect the ability to move or to coordinate the control movement.

There is a wide range of conditions that may result in physical impairment including:

- cerebral palsy
- spina bifida
- muscular dystrophy
- arthritis
- osteogenesis imperfecta
- congenital malformation of the limbs
- acquired brain injuries
- orthopedic conditions.

Motor impaired/orthopedic disabilities include a heterogeneous grouping of conditions with a wide range of causes. In this manual, we shall not talk of every cause but we shall focus on the most common ones. We are now interested in defining mobility problems, cerebral palsy, muscular dystrophy and spina bifida. We shall point out different types of physical impairments, their causes and finally tackle on teaching methodologies used in an environment where children have physical difficulties. The use of assistive devices is talked about in the last unit.
Unit two: Children with mobility problems

How to help children with physical impairments to access easily the school environment?

Learners with physical impairments may face problems in their learning, especially with accessibility and academic performance. In accessibility, Physical access to classrooms is a major concern for students with mobility impairments. The student must learn routes to and from classes that do not present barriers. A barrier may be stairs, a curb, a narrow walkway, a heavy door, an elevator door, or a vehicle that may be blocking a ramp. Those who fatigue easily or who use wheelchairs, braces, crutches, canes, or prosthesis may have difficulty moving about, especially with time constraints of class schedules.

Occasional lateness or absence may be caused by general and special public transportation delivery, difficulties locating disabled parking, bad weather, maneuvering along crowded paths and corridors, waiting for assistance in opening of doors or possibly elevator or wheelchair breakdown. Students will be aware of restrictions and should schedule classes accordingly. However, it is not always possible to leave enough time between classes.

When meeting someone using a wheelchair:

- Offer assistance, but do not insist;
- Allow the person to tell you exactly what would help;
- Realize that many individuals that use wheelchairs are quite independent;
- Do not invade a person’s space by leaning upon or holding on to the wheelchair;
- Do not pat the person on the head. This gesture can be demeaning and patronizing;
- Conduct conversations at eye level whenever possible;
Incorporate words like “walking” and “running” into your conversation. People who use wheelchairs use the same words.

Accessibility

To assist this student, teachers should:

- Consider whether physical access to the classroom or time constraint between scheduled classes is problematic before or early in the session to discuss with the student;
- Be prepared to arrange for a change of classroom or building if the class site is not accessible;
- Consideration of emergency evacuation planning should also be made. If in the event an elevator is not available, consider possible solutions that enable the child move freely;
- Familiarize oneself with the evacuation plan and ensure its manageability for students with mobility impairments.

Suggestions for teachers

When seating a student with a physical impairment, every effort should be made to integrate them into the classroom. Assigning students to a doorway, a side aisle, or in the back of the room should be avoided. A wider aisle may need to be provided along with an adjustable table in lieu of a desk. Some students prefer to remain in their wheelchairs instead of transferring to a student desk. Using a wheelchair some of the time does not mean a student is faking a disability. It may be a means of conserving energy.

Unit three: Cerebral palsy

Definition

Cerebral palsy is a term used to describe a group of chronic conditions affecting body
movements and muscle coordination. It is caused by damage to one or more specific areas of the brain, usually occurring during fetal development or infancy. It also can occur before, during or shortly following birth.

"Cerebral" refers to the brain and "Palsy" to a disorder of movement or posture. If someone has cerebral palsy, it means that because of an injury to their brain (cerebral) they are not able to use some of the muscles in their body in the normal way (palsy). Children with cerebral palsy may not be able to walk, talk, eat or play in the same ways as most other children.

Cerebral palsy is neither progressive nor communicable. It is also not "curable" in the accepted sense, although education, therapy and applied technology can help persons with cerebral palsy lead productive lives. It is important to know that cerebral palsy is not a disease or illness. It isn't contagious and it doesn't get worse. Children who have cerebral palsy will have it all their lives.

Cerebral palsy is characterized by an inability to fully control motor function, particularly muscle control and coordination. Depending on which areas of the brain have been damaged, people with cerebral palsy may experience one or more of the following:

- Muscle tightness or spasm
- Involuntary movement
- Disturbance in gait and mobility
- Abnormal sensation and perception
- Impairment of sight, hearing or speech
- Seizures

**Types of Cerebral Palsy**

All children with cerebral palsy have damage to the area of the brain that controls muscle tone. As a result, they may have increased muscle tone, reduced muscle
tone, or a combination of the two (fluctuating tone). Which parts of their bodies are affected by the abnormal muscle tone depends upon where the brain damage occurs.

There are four main types of cerebral palsy:

- **Spastic Cerebral Palsy**: It is characterized by stiff and difficult movement.
- **Athetoid Cerebral Palsy**: It is characterized by involuntary and uncontrolled movement
- **Ataxic Cerebral Palsy**: It is characterized by disturbed sense of balance and depth perception
- **Mixed Cerebral Palsy**: There may be a combination of these types of cerebral palsy for any one person.

**Causes of Cerebral Palsy**

A child having cerebral palsy is the one having brain damage. There are many possible causes:

- An injury to the brain before, during, or shortly after birth. In many cases, no one knows for sure what caused the brain injury or what may have been done to prevent the injury. The severity of the brain damage generally depends on the type and timing of the injury. For example, in very premature babies, bleeding into the brain (intraventricular hemorrhage) can cause extensive damage. Also, the longer an unborn child goes without oxygen, the greater the extent of brain tissue damage.

- Failure of the brain to develop properly (developmental brain malformation);

- Neurological damage to the child's developing brain;
- Diseases like meningitis;

- Lack of oxygen (anoxia) at birth. It is very important that you understand that a brain injury caused during delivery in many cases could have been prevented. Medical mistakes are responsible for thousands and thousands of cerebral palsy cases.

**Unit four: Muscular dystrophy**

**Definition**

Muscular dystrophy (MD) refers to a group of hereditary muscle diseases that weaken the muscles that move the human body. Muscular dystrophies are characterized by progressive skeletal muscle weakness, defects in muscle proteins, and the death of muscle cells and tissue. Most types of MD are multi-system disorders with manifestations in body systems including the heart, gastrointestinal and nervous systems, endocrine glands, skin, eyes and other organs.

Muscular dystrophy (MD) is a genetic disorder that gradually weakens the body’s muscles. It is caused by incorrect or missing genetic information that prevents the body from making the proteins needed to build and maintain healthy muscles.

It affects the ability to do things like walk, sit upright, breathe easily, and move the arms and hands. This increasing weakness can lead to other health problems. There are several major forms of muscular dystrophy, which can affect the muscles to varying degrees. In some cases, MD starts causing muscle problems in infancy; in others, symptoms don't appear until adulthood.

There is no cure for MD, but researchers are quickly learning more about how to prevent and treat it. Doctors are also working on improving muscle and joint function and slowing muscle deterioration so that those with MD can live as actively and independently as possible.
**Characteristics**

Many kids with muscular dystrophy follow a normal pattern of development during their first few years of life. But in time common symptoms begin to appear. A child who has MD may start to stumble, waddle, have difficulty going up stairs, and toe walk (walk on the toes without the heels hitting the floor). A child may start to struggle to get up from a sitting position or have a hard time pushing things, like a wagon or a tricycle.

Kids with MD often develop enlarged calf muscles (called calf pseudohypertrophy) as muscle tissue is destroyed and replaced by fat.

---

**Unit five: Spina bifida**

**Definition**

Spina bifida is a birth defect that involves the incomplete development of the spinal cord or its coverings. The term spina bifida comes from Latin and literally means "split" or "open" spine.

Spina bifida occurs at the end of the first month of pregnancy when the two sides of the embryo's spine fail to join together, leaving an open area. In some cases, the spinal cord or other membranes may push through this opening in the back. The condition usually is detected before a baby is born and treated right away.

**Types of Spina Bifida**

The causes of spina bifida are largely unknown. Some evidence suggests that genes may play a role, but in most cases there is no familial connection. A high fever during pregnancy may increase a woman's chances of having a baby with spina bifida. Women with epilepsy who have taken the drug valproic acid to control seizures may have an increased risk of having a baby with spina bifida.

The two forms of spina bifida are spina bifida occulta and spina bifida manifesta.
Spina bifida occulta is the mildest form of spina bifida (occulta means hidden). Most children with this type of defect never have any health problems, and the spinal cord is often unaffected.

Spina bifida manifesta includes two types of spina bifida:

1. Meningocele involves the meninges, the membranes responsible for covering and protecting the brain and spinal cord. If the meninges push through the hole in the vertebrae (the small, ring-like bones that make up the spinal column), the sac is called a meningocele.

2. Myelomeningocele is the most severe form of spina bifida. It occurs when the meninges push through the hole in the back, and the spinal cord also pushes through. Most babies who are born with this type of spina bifida also have hydrocephalus, an accumulation of fluid in and around the brain.

Because of the abnormal development of and damage to the spinal cord, a child with myelomeningocele typically has some paralysis. The degree of paralysis largely depends on where the opening occurs in the spine. The higher the opening is on the back, the more severe the paralysis tends to be.

Children with spina bifida often have problems with bowel and bladder control, and some may have attention deficit hyperactivity disorder (ADHD) or other learning difficulties.

Causes

The causes of spina bifida are largely unknown.

Major causes are:

- Genetic factors: Some evidence suggests that genes may play a role, but in most cases there is no familial connection.
- A high fever of a mother during pregnancy may increase chances of having a baby with spina bifida.
- Women with epilepsy who have taken the drug valproic acid to control seizures may have an increased risk of having a baby with spina bifida.
Spina bifida malformations fall into four categories:

- *spina bifida occulta*,
- *spina bifida cystica (myelomeningocele)*,
- *meningocele* and
- *lipomeningocele*.

The most common location of the malformations is the lumbar and sacral areas. Myelomeningocele is the most significant form and it is this that leads to disability in most affected individuals. The terms spina bifida and myelomeningocele are usually used interchangeably.

The figure below is showing a child having spina bifida cystica:
Unit six: Teaching children with physical impairments

One of the first considerations in the effective teaching of individuals with physical impairments is a positive understanding of his/her impairment and the degree of educational limitation it causes. With such information, a set of initiatives and strategies can be derived that are fully appropriate to that particular student; however, some of the strategies may not work for every student.

Generally the teacher should take into account the following strategies:

- Accept the fact that a disability exists. Not acknowledging this fact is not acknowledging the person;
- Ask the student to tell you when he/she anticipates a need for assistance;
- Don't lean on a student's wheelchair. The chair is a part of the body space of the student who uses it;
- Don't patronize students who use wheelchairs by patting them on the head. This is a sign of affection that should be reserved only for small children, and most of them do not like it either;
- Encourage students who use crutches or canes to keep them within easy reach and make such a space available;
- Only push a wheelchair when asked,
- Have custodians use non-skid floor polish for students who use crutches and wheelchairs;
- If spills occur, keep floors clear of liquids;
- If writing is difficult, let the child use a tape recorder;
- Speak directly to the student with a disability, confidentially, as you would other students;
- Students should be encouraged to talk confidentially with their teachers during the first week of classes individual assessment to discuss their functional difficulties and needs, and to talk about ways to accommodate;
- Using a wheelchair when the person can walk with the aid of cane(s), brace(s), crutch(es), or a walker does not mean a student is "feigning" the
degree of disability. It may be a means to conserve energy or move about more quickly;

- When it appears that a student needs help, ask if you can help;
- When talking to a student who uses a wheelchair for more than a few minutes, or so, sit down or kneel to place yourself at that student's eye level;
- Reserve sitting space that is accessible and close to the teacher or peer helper;
- Allow course waiver or course substitution for certain students;
- Always plan any field trip in advance to ensure accessibility;
- Words like "walking" or "running" are appropriate. Sensitivity to these words is not necessary. Students who use wheelchairs use the same words.

- Consider accessibility factor to classroom so that student is able to get to class on time.

When teaching, the teacher considers the following:

- The student who has a mobility impairment may frequently be a few minutes late. Help him/her not miss important material.
- Consider alternate activities/exercises that can be utilized with less difficulty for the student, but has the same or similar learning objectives
- Allow more time for the student to finish his/her work
- Provide assistance, but also provide positive reinforcement when the student shows the ability to do something unaided.
- Use a peer-tutoring system and include student in open discussions.
- Provide a separate place for the test if necessary.
- Give completely oral tests or completely written tests, whichever is more appropriate to the students needs.
Unit seven: Use of assistive devices

Assistive devices can be defined as any tool or means that children or adults with physical limitations might use to help them learn and function more effectively. For our case now, children with physical impairment need for example wheel chairs, canes, crutches, computers, etc.

Students with physical challenges have access to some devices to help make learning. These children can benefit from machines designed to help them learn! Such "assistive devices" aid their learning, understanding, and participation in the regular classroom environment.

Use of assistive devices in the classroom

Assistive devices are used differently in the classroom and for different purposes as for example:

- Peers are active assistive devices when they help their classmates with slow pace and limited functions in learning to catch up;
- Use of a wheel chair for a child having mobility problems;
- Use of software to read or write.

Sometimes, teachers and parents need to learn how a device operates in order to help the child with physical handicap to use it. They are advised to find a device to help students with special needs reach every bit of their potential. Once the device is there, they also have to keep it safely and help in maintaining it. "The devices that help the least, especially in classrooms, are those that the teachers don't understand," Linkhorn says. "Kids have an amazing ability to utilize devices, but if there isn't a high enough level of training for staff, many devices are a waste of time and money."
References


- David Werner (1987), Disabled village children.


- Sherril Steele-Carlin (2006), “Assistive aids with parents and teachers who use the technology, and with those who provide it to schools”, Education World.

- Florida Atlantic University, “*Text on physical impairment*”, Office of Students with Disabilities, December 2009.