



தமிழ்நாடு திறந்தநிலைப் பல்கலைக்கழகம்
TAMILNADU OPEN UNIVERSITY

SEMESTER -01

BACHELOR OF EDUCATION
in
SPECIAL EDUCATION

SED 16 - INTRODUCTION TO LOCOMOTOR AND

MULTIPLE DISABILITIES

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TAMIL NADU OPEN UNIVERSITY

**SCHOOL OF SPECIAL EDUCATION AND
REHABILITATION**

**Bachelor of Education in Special Education
(B.Ed.Spl.Ed.)**

SEMESTER – I

SED-16

**INTRODUCTION TO LOCOMOTOR AND
MULTIPLE DISABILITIES**

**No. 577, Anna Salai, Saidapet,
Chennai – 600 015.**

TAMIL NADU OPEN UNIVERSITY

SCHOOL OF SPECIAL EDUCATION AND REHABILITATION



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TAMIL NADU OPEN UNIVERSITY

(A State Open University Established by Government of Tamil Nadu, Recognized by UGC & DEB,
Member in Asian Association of Open Universities & Association of Commonwealth Universities)

No.577, Anna Salai, Saidapet, Chennai - 600 015. Tamil Nadu.

Professor K.Parthasarathy

Vice Chancellor

20-03-2021

Dear Learner,

Warm Greetings!

I deem it a great pleasure in welcoming you to our vibrant Open and Distance Learning family of Tamil Nadu Open University (TNOU). Being approved by the University Grants Commission and Distance Education Bureau, the TNOU is striving hard to ensure qualitative Open, Distance and Online Education (ODOE). The University is contributing not only serving to reach the unreached, but also enhancing the Gross Enrolment Ratio (GER) by offering various programmes at different levels for the needy and interested.

You are taking up the B.Ed., Special Education programme as a professional study by merit. The B.Ed. Special Education Programme offered by the TNOU is recognized by the Rehabilitation Council of India (RCI), the University Grants Commission (UGC) and the State Government. You might be aware that the trained teachers/personnel/professionals who come out from this programme of study can work in the special schools, inclusive setting, colleges and rehabilitation centres, and such certified persons alone are eligible to work with, train persons with disabilities as per the law enforcement in our country.

The Rights of Persons with Disabilities Act, 2016 stated that all the children with disabilities between 6-18 yrs of age are to be considered for inclusive education. Accordingly, the syllabus of B.Ed.Spl.Ed.Programme has been framed and updated including current practices, latest policies and Acts, and innovative models and strategies in the field of disability and non-disability areas. The Self -Learning Materials (SLM) prepared with the help of subject experts and as per the UGC Guidelines & SLM Policy of TNOU. The handy SLM would be very much helpful for you, and teachers, parents, and other professionals dealing with persons with disabilities.

I wish you great success in all your endeavors and to become a versatile special educator.

With regards,

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**TAMIL NADU OPEN UNIVERSITY
SCHOOL OF SPECIAL EDUCATION AND
REHABILITATION**

SED – 16

**INTRODUCTION TO LOCOMOTOR AND
MULTIPLE DISABILITIES**

BLOCK 1

Cerebral Palsy

BLOCK 2

Amputees, Polio, Spinal Cord injuries Spina-bifida
and Muscular Dystrophy

BLOCK 3

Multiple Disabilities and other Disabling Conditions

SED – 16 CONTEMPORARY INDIA AND EDUCATION

COURSE INTRODUCTION

This course consists of three Blocks:

Block 1: Cerebral Palsy (CP)

Block 2: Amputees, Polio, Spinal Cord Injuries Spina-bifida and Muscular Dystrophy

Block 3: Multiple Disabilities and Other Disabling Conditions

This course aims to develop understanding about planning effective educational programme and functional activities for students with locomotor and multiple disabilities. This course intends to develop required skills in teacher trainee to identify the children with locomotor and multiple disabilities and also plan an effective programme education as well as for creating awareness on these conditions. Teacher is also expected to plan an effective therapeutic and programme and also refer for medical intervention whenever if necessary.

Block-1 explains about Cerebral Palsy, its nature, types and associated conditions; assessment of functional difficulties including abnormalities of joints and movements; provisions of therapeutic intervention and referral of children with CP; implications of functional limitations of children with CP in education and creating prosthetic environment in school and home; facilitating teaching-learning of children with CP in school, IEP, developing TLM, assistive technology to facilitate learning and functional activities.

Block-2 describe the Amputees, Polio, Spinal Cord injuries Spina-bifida and Muscular Dystrophy with a focus on definition, meaning, classification; assessment of functional difficulties; provision of Therapeutic Intervention and Referral; Implications of Functional Limitations for Education and Creating Prosthetic Environment in School and Home; Facilitating Teaching-Learning: IEP, Developing TLM; Assistive technology.

Block -3 deals with Multiple Disabilities and other disabling conditions with a focus on Meaning and Classifications; Various Combinations of Multiple Disabilities and Associated Conditions Such as Epilepsy, Motor and Sensory Conditions; Other Disabling Conditions such as Leprosy Cured Students, Tuberos Sclerosis and Multiple Sclerosis; Implications of Functional Limitations for Education and Creating Prosthetic Environment in School and Home; Facilitating Teaching-Learning: IEP, Developing TLM; Assistive technology.

BLOCK 1 CELEBRAL PALSY (CP)

Structure

Introduction

Objectives

Unit 1 CP: Nature, Types and its Associated Conditions

1.1 Definition of Cerebral Palsy

1.2 Causes of Cerebral Palsy

1.3 Types of Cerebral Palsy

Unit 2 Assessment of Functional Difficulties of CP

Unit 3 Provision of Therapeutic Intervention and Referral of
Children with CP

Unit 4 Implications of Functional Limitations of Children with CP
in Education and Creating Prosthetic Environment in School
and Home

Unit 5 Facilitating Teaching-Learning of Children with CP

Let Us Sum Up

Glossaries

Answers to Check Your Progress

Suggested Readings

INTRODUCTION

This Block gives in depth information on the condition called Cerebral Palsy. The Block will discuss definitions, causes and characteristics of each type and subtype of Cerebral Palsy. This Block will also address ways to assess functional difficulties in children with Cerebral Palsy and different types of therapeutic interventions. The final part of the unit will talk about methods and strategies to be adopted that will enhance the overall development of individuals with Cerebral Palsy in all the domains of development. There are revision questions at the end of the unit. It will be beneficial for the students to visit the provided websites for more information on Cerebral Palsy.

OBJECTIVES

After studying this unit, students will be able to:

- Explain the condition called Cerebral Palsy, the types and subtypes of Cerebral Palsy, causes and characteristics of the different types and subtypes of Cerebral Palsy.
- Understand different ways to assess functional difficulties in children.
- Explain the various types of therapeutic interventions available for individuals with Cerebral Palsy including speech therapy, physiotherapy, occupational therapy and augmentative communication devices.
- Implement seating, positioning and handling techniques that will enhance their mobility and reduce postural fatigue.

UNIT 1 CP: NATURE, TYPES AND ASSOCIATED CONDITIONS

Cerebral Palsy (CP) refers to a group of disorders that affect muscle, movement and coordination. In many cases, Cerebral Palsy can also affect vision, hearing and sensations. "Cerebral" means having to do with the brain and "Palsy" means weakness of body movements.

After completion of this Unit, you will be able to

- Define the Cerebral Palsy
- Describe the causes, types and characteristics of CP

1.1 Definition of Cerebral Palsy:

"Cerebral palsy is a disorder of movement, muscle tone or posture that is caused by damage that occurs to the immature, developing brain, most often before birth. Signs and symptoms appear during infancy or preschool years. In general, cerebral palsy causes impaired movement associated with abnormal reflexes, floppiness or rigidity of the limbs and trunk, abnormal posture, involuntary movements, unsteady walking, or some combination of these."

Cerebral Palsy refers to a group of disorders that affect muscle, movement and coordination. In many cases, Cerebral Palsy can also affect vision, hearing and sensations. "Cerebral" means having to do with the brain and "Palsy" means weakness of body movements.

1.2 Causes of Cerebral Palsy

Cerebral palsy represents the most prevalent childhood disorder impacting motor function and development. The term refers to several types of neurological impairments, each marked by particular signs and symptoms.

Cerebral palsy typically results from damage to the brain during pregnancy or childbirth and less frequently from trauma or injury during early life. Most cases of cerebral palsy were once thought tied to childbirth complications, during which babies were deprived of oxygen. Modern research points to a different conclusion, however, with the National Institute of Neurological Disorders and Stroke now attributing only about 5-10% of cases of CP to incidence of birthing complications.

As its name indicates, CP affects the brain's cerebrum. This part of the brain controls voluntary movement, and is integral to many other functions. In addition to mobility, the cerebrum influences cognitive processes and emotions, as well as certain aspects of vision, speech and hearing. Patients are susceptible to problems in all of these areas.

1.3 Types of Cerebral Palsy

Cerebral Palsy is classified to help describe how brain damage can impact mobility. These types are classified based on two factors: the problems in movement and the body parts being affected.

The four major types of cerebral palsy are,

- A. Spastic,
- B. Athetoid
- C. Ataxic and
- D. Mixed type.

The type of cerebral palsy depends on the severity of the brain injury that has affected muscle tone. Muscle tone is defined as the strength and tension in the muscles. The two common terms that describe how cerebral palsy affects muscle tone are hypertonia and hypotonia.

Hypotonia: low muscle tone causing a loss of strength and firmness.

Hypertonia: High muscle tone causing rigidity and spasmodic movement.

Common characteristics across all types of Cerebral Palsy:

- Individuals with cerebral palsy are prone to co-occurring conditions which can impact vision, hearing, swallowing as well as bladder, bowel functions and other physical functions.
- Individuals may have difficulty reasoning.
- Slow development may also be seen in children with cerebral palsy.
- Children with cerebral palsy often experience involuntary and unpredictable movements and experience difficulty rolling over, sitting up, crawling, standing up and walking.
- Individuals with severe cases of cerebral palsy may not be able to walk.
- Some children with cerebral palsy may exhibit an early hand preference.

A. Spastic cerebral palsy:

Overview

This is the most common type of Cerebral Palsy. People with this type of Cerebral Palsy experience exaggerated or jerky movements (hypertonia). This is caused when a damaged part of the brain sends wrong neurological messages impeding normal development of the motor functions in the body.

Causes of Spastic Cerebral Palsy:

Spastic Cerebral Palsy is caused due to brain damage during birth, delivery or the first few years of life. This is caused due to the motor cortex or the pyramidal tracts of the brain being affected.

Characteristics of spastic cerebral palsy:

- Muscle stiffness and tightness resulting in jerky movements and exaggerated stiffness.
- Some individuals with spastic cerebral palsy experience seizures and tremors.
- Children with spastic cerebral palsy experience poor coordination during deliberate movements.
- Individuals have difficulty executing precise motor control.

- In cases where upper limbs are affected, individuals show flexion at the elbow, wrist and fingers.
- Bent joints cause difficulty performing certain tasks where spasticity causes fisted fingers.
- Stiff joints cause difficulty to balance, stand or walk causing lower limb spasticity.
- In cases where one or both legs are affected, the hips and knees are subject to flexion causing postural changes causing difficulty in standing and walking.
- The leg is pulled upward when a hip is involved resulting in a forward leaning posture.
- A scissored gait results from muscle tightness pulling the thighs together. Tight calf muscles can strain leg movement creating the appearance of walking on one's toes.

Types of spastic cerebral palsy:

a. Spastic Quadriplegia

This type of spastic cerebral palsy refers to difficulty in controlling movements in the arms and the legs. Individuals with this type of Cerebral Palsy will not have muscle paralysis but rather jerking motions that come from stiffness within all four limbs.

Causes of Spastic Quadriplegia:

The four causes to spastic quadriplegia are

- Damage to a certain part of the nervous system
- General brain damage
- Bleeding in the brain
- Lack of oxygen to the brain.

Characteristics of Spastic Quadriplegia:

- This type normally affects the whole body.
- The facial muscles and the core of the body are unable to perform their normal functions due to very high muscle tightness and strain.

- Symptoms may typically be seen anywhere from three months to two years old.
- Infants are not able to control their head or make scissor like motion with their legs.
- Infants are unable to stand or crawl by twelve months and have difficulty stretching or moving.
- The muscles in the body contract and relax quickly. It is also possible that there is general tautness in the muscles that leads to structural damage in the core of the body.
- Difficulty in sitting up or controlling bladder and bowel functions.

b. Spastic Diplegia

The lower portion of the body is affected due to this type of Cerebral Palsy. Diplegia affects two of the limbs (the legs) rather than the whole body. This condition is also known as Little's disease after the doctor who first wrote about this form of Cerebral Palsy. The severity is lesser than in spastic quadriplegia.

Causes of Spastic Diplegia:

Spastic Diplegia is mainly caused due to neonatal asphyxia. Neonatal asphyxia occurs when a newborn is deprived of oxygen at birth. Babies born prematurely or with a low birth weight have problems since these babies have problems with oxygen. Another reason for spastic diplegia is maternal infections, high grade fever or rubella.

Characteristics of Spastic Diplegia:

- Children will show signs and symptoms within the first few years.
- Children display scissoring and contracting symptoms similar to a child with quadriplegia.
- Children see many developmental conditions similar to children with spastic quadriplegia.
- Children may have vision problems.
- Babies use their upper limbs more than their legs and arms to crawl.

- Infants and toddlers between 1 and 3 years may prefer sit in a “W” shape. It is best to help children to sit cross legged if this happens.
- Children have difficulty standing on their own by three years of age.
- Children walk with their feet turned inward or they roll their feet.
- Children with diplegia may only be able to walk small distances.

c. Spastic Hemiplegia

In this condition, the upper extremity is more affected than the lower extremity. The brain is unable to send proper nerve signals to the patient’s muscles in this form of Cerebral Palsy. Spastic hemiplegia is a rather common form of Cerebral Palsy.

Causes of Spastic Hemiplegia:

Spastic hemiplegia could be caused due to the congenital abnormality of the Corpus Callosum being absent at birth. Sometimes, the condition of hydrocephalus could also cause hemiplegia. Hydrocephalus is the condition of fluid accumulation in the brain which causes the head to enlarge and brain damage. It is also possible for this condition to develop due to a childhood illness like pertussis, measles, mumps or chicken pox.

Characteristics of Spastic Hemiplegia:

- This is usually noticed in infants who are six months of age or later.
- Some children show early clenching of the fist.
- Children may use only one and the affected hand may be dormant.
- Children with hemiplegia are delayed in crawling, sitting and walking.
- Spastic hemiplegia tends to get recognized early due to the asymmetry of postures and movements.
- Children have difficulty grasping, since they tend to use only one hand.

- Children may present with vision problems due to error in the field of vision and underlying optic atrophy.
- Children with this condition do not typically show hearing problems.
- Children experience sensory loss in the affected hand and may not be able to perceive sensory objects in the affected hand.
- The affected limbs are thinner or shorter than the non affected limbs.
- Children with this condition may be prone more to epilepsy.

B. Athetoid Cerebral Palsy

Definition

Athetoid cerebral palsy is also known as dyskinetic cerebral palsy. This condition occurs due to lesions in the basal ganglia of the brain.

Causes

This condition occurs due to malformations in the brain or brain damage. In the case of an unborn baby, this condition can occur due to infection in the foetus or mother. Foetal stroke could also cause this condition which results in bleeding in the baby's brain.

Characteristics

- This condition occurs in infants within the first year and a half after birth.
- Children with this condition experience involuntary movements of arms, hands and legs.
- The involuntary movements may either be slow or repetitive and random.
- This condition also causes involuntary facial movements and drooling.
- There are increased involuntary movements when a child with this condition is under stress or is excited.
- Involuntary movements are minimal when individuals with this condition are asleep.
- This condition can result in speech, hearing or vision problems.

- This condition could lead to difficulty with swallowing thus resulting in difficulty in eating and drinking.
- This condition causes a mixed muscle tone in the body thus resulting in the muscles being tight or very loose.

C. Ataxic Cerebral Palsy

Definition

The term “ataxia” means “incoordination” or “without order”. This condition is characterized by clumsiness, or instability. Individuals show disorganised or jerky movements. The uncoordinated movements are seen while an individual is walking or picking up objects. Ataxia leads to interruption of muscle control in the arms and legs which leads to imbalance and poor coordination.

Causes

Ataxia is caused by damage to the cerebellum part of the brain. The cerebellum is the balance center of the brain and fine tunes movements and commands.

Characteristics

- Causes tremor due to shakiness in the arms.
- Difficulty with performing fine motor activities such as handwriting, using forks, spoons and handwriting,
- Results in instability. Individuals walk with feet spread apart from the hips in a “wide-base gait” to compensate for the instability and poor balance.
- Individuals tend to bump into things due to poor balance.
- Speech and swallowing is affected. Individuals use “scanning speech” in which a person uses a monotone voice with a breathy sound.
- There are unusual accelerations or pauses between their syllables.
- Ataxia causes slow eye movements. Individuals may miss the target when they change their eye gaze quickly.

- Their eyes overshoot or underestimate the tasks, thus needing to make catch up movements.

D. Mixed Cerebral Palsy

Definition

Mixed Cerebral Palsy is a developmental disorder caused by brain damage that takes place before, during or shortly after birth. Those with mixed cerebral palsy have damage to the motor control centers in several parts of the brain. Children who show characteristics of more than one type of cerebral palsy are said to have mixed cerebral palsy.

Types

Mixed Cerebral Palsy, varies, based on the location of movement problems. These problems can occur in the legs (diplegia), one half of the body (hemiplegia) or all four limbs (quadriplegia).

Causes

Similar to other types of cerebral palsy, this is caused due to damage in the brain. When multiple parts of the motor control centers of the brain are affected, this results in mixed cerebral palsy.

Motor cortex: This is the caused damage to the motor cortex causes spasticity in the muscles, joints and tendons.

Basal ganglia: Damage to the basal ganglia affects motor movements and cognition.

Characteristics

- Individuals with this type of cerebral palsy show difficulty with movement including spasticity which is abrupt, with convulsive movements.
- Individuals show involuntary movements, imbalance and lack of coordination.
- The symptoms of different types of cerebral palsy can be found on different combinations in mixed cases:

spastic - high muscle tone causing stiffness and jerky movements

Athetoid: variations in high and low tone causing rigidity and floppiness

Ataxic: Issues with balance and coordination affect normal movement.

- Mixed Cerebral Palsy varies based on the location of movement problems: These problems can occur in the legs diplegia), one half of the body (hemiplegia) or all four limbs (quadriplegia).
- Individuals have inability holding up their head.
- Individuals have abnormally stiff muscles.
- Individuals have crossed legs or abnormal gait.
- Individuals have inability to roll over.
- Individuals tend to favour one arm over the other.

Check your progress

Note: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

1. Cerebral Palsy is caused due to injury in which part of the body?
a. Brain b. Spinal cord c. Legs
2. The term “Cerebral” means having to do with the ____ and “palsy” means _____ of body movements.
a. Liver; toxin b. Brain; weakness c. Kidneys; spasms

UNIT 2 ASSESSMENT OF FUNCTIONAL DIFFICULTIES OF CP

Functional assessment is a complete assessment of how a child is functioning in all environments.

After completion of this Unit, you will be able to

- Describe the various functional assessment tools for Cerebral Palsy

The process of assessment helps us to understand the extent of cerebral palsy, the type of cerebral palsy and make an informed choice

about intervention. Assessment information also helps us see the extent of progress after the intervention has been implemented.

The following checklist is a good starting point to determine if a child has developmental delays.

This checklist can be used with infants up to 12 months or older:

2 months and older:

- Have difficulty controlling his head when picked up
- Have stiff or shaky arms or legs
- Have stiff legs that cross or “scissor” when picked up
- Have oral motor difficulties and problems sucking and feeding

6 months and older:

- Continue to exhibit poor head control when picked up
- May reach with only one hand while keeping the other in a fist
- Have problems eating and drinking
- May not roll over without assistance
- May not be able to push up with their hands when laying on their stomach

10 months and older:

- Crawl by pushing off with one hand and leg while dragging the opposite hand and leg
- Unable to sit by himself or herself

12 months and older:

- Not yet crawl or attempt to pull themselves up
- Not be able to stand with support.

The following ways can be used to assess Cerebral Palsy for clinical practise and intervention planning:

People with cerebral palsy have challenges with walking. This is mainly due to tight muscles, spasticity, joint problems, poor balance and alignment of certain bones. These difficulties get more pronounced with age causing more complications.

➤ **2D Gait Analysis**

The purpose of 2D Gait Analysis is to assess a person's ability to walk with an upright posture (postural control) and their walking style (gait patterns). This is known as a kinematic analysis. Problems can be identified and interventions introduced to help improve their gait, if needed.

A 2D Gait Analysis can be used for people with cerebral palsy of any age who can walk (GMFCS Levels I-III).

A 2D Gait Analysis is carried out by an experienced clinician, who will take a video recording of a person walking along a walkway (usually a number of times).

The clinician will assess the person's movements at hip, knee and ankle level, and their overall posture. Some of the movements that are assessed include stride time, length, stance time, swing time, joint angles and symmetry, comparing them to a typical walking style. They will be analysed from the front, side and back.

Afterwards, the video recording of the person walking is played back in slow-motion. 2D Gait Analysis software may also be used to help analyse their gait and identify any problems.

The health professional can then use this assessment information to determine the best interventions for them. Treatments may include goal-directed training, wearing ankle foot or thoses and possibly even surgery, depending on how severe their gait problems are.

The amount of time it takes to complete this assessment is between 10 and 30 minutes. Additional time is required for the video to be analysed and for any report writing. In total, a thorough kinematic analysis of a gait, video can take between one to two hours.

➤ **COPM**

The Canadian Occupational Performance Measure (COPM) is used to help people with cerebral palsy and their families identify activities that are important to them to work on in therapy. It focuses on everyday activities like self-care, attending school or work and participating in leisure or play. The COPM is known as an individualised measure because it calls for each person to consider their own situation and develop goals that are personally meaningful. Health professionals and people with cerebral palsy and their families complete a COPM to work out the priorities for therapy

and intervention. Importantly, they will also complete a COPM afterwards, to measure how they have progressed in their chosen activities.

The COPM assessment can be used with people of any age, and with cerebral palsy of any severity. For children under eight-years-old and those with communication difficulties or intellectual disability, family members or carers may need to complete the COPM. A health professional will use a semi-structured interview to guide the person with cerebral palsy and their family to identify up to five daily activities they need to do, want to do - or would like to do better. The health professional plays an important role in working with the person and family to ensure the activities they choose are realistic and achievable. Completing the COPM usually takes between 20 and 40 minutes.

➤ **Goal Attainment Scaling (GAS)**

This is used to help a person with cerebral palsy and their family develop personal goals for therapy, in collaboration with their health professional. GAS can be used by itself or in combination with other assessments. Health professionals will use GAS to help people with cerebral palsy work out goals to work on during therapy or intervention. Setting personal goals can help focus the attention and energy of the client and their health care provider. This, in turn, may increase motivation levels and help someone achieve improvements in different areas of their life. Importantly, a second GAS is completed after therapy or intervention to measure whether the goals have been achieved.

GAS can be used by people of any age and with cerebral palsy of any severity to measure the outcomes for a wide range of interventions and services. The health professional completes the assessment with the client, their parent or family member - or both people together.

The health professional works with the client and their family to identify goals that matter to them. Goals may be related to participating in life situations, such as going to youth groups or the movies. Goals may also be related to everyday activities such as improving handwriting, eating with a knife and fork, riding a bike or catching a ball. Health professionals play an important role in helping the person and family select goals that are realistic and achievable. After completing the therapy or intervention, the health professional will help the person and their family determine how well their goals were achieved. Completing a GAS assessment usually takes between 20 and 40 minutes.

➤ The Gross Motor Function Measure (GMFM) is used to evaluate changes that occurs over time in the gross motor function of children with cerebral palsy. It explores five areas of motor ability, which are known as dimensions:

- A) Lying and rolling
- B) Sitting
- C) Crawling and kneeling
- D) Standing
- E) Walking, running and jumping

➤ **GMFCS**

A different tool, the Gross Motor Function Classification System (GMFCS) is used to classify severity of mobility.

GMFM is used to:

- Monitor a child's development
- Assist with goal setting and planning therapy
- Evaluate the outcome of motor interventions and therapies
- Assist with predicting motor outcomes at older ages, using The assessments are most appropriate for children aged five-months to 16-years and can be used to assess a child with any level of motor severity. In this assessment, a physiotherapist will ask the child with cerebral palsy to complete a number of gross motor activities, depending on the child's age and ability. These activities could include rolling, sitting, walking backwards, climbing stairs, and standing on one foot. The GMFM takes roughly 45 to 60 minutes to complete. People with cerebral palsy can have everyday problems with their mobility, speech, communication, hearing and self-care. These can often be helped with equipment or assistive technology.

➤ **The Individually Prioritised Problem Assessment (IPPA)**

IPPA measures whether a piece of equipment or assistive technology has reduced the challenges a person is facing, as intended. Some examples of how this assessment can be used include to measure whether a person's assistive technology has reduced repetitive strain from using a communication device, improved communication at work,

or increased computer proficiency. IPPA is known as an individualised, client-centred measure, because each person with cerebral palsy considers their own situation and identifies what is important to them

The assessment can be used for any person with cerebral palsy, including both children and adults. People with communication difficulties, or a significant intellectual disability and children under 16-years-old need a parent or care taker to help. The IPPA is completed by a healthcare professional with the person with cerebral palsy, along with their family and carers if needed. Before any equipment or assistive technology is selected, up to seven problems that need to be addressed may be identified. The importance and difficulty of each problem is scored by the person and/or their family. A total score is then calculated.

After the equipment or assistive technology has been used for a period of time, often two to three months. The person's problems are then rated for a second time. Comparing these scores helps determine if the equipment or assistive technology has solved the problems. If the IPPA identifies that the equipment or assistive technology is not helping the person with cerebral palsy as it was meant to, then new options for assistance can be explored. It takes about 20 minutes to work out the problems and complete the ratings the first time the assessment is completed. For subsequent ratings, it can take even less time.

➤ **Kids-Assisting Hand Assessment (Kids-AHA)**

Kids - AHA measures how well children with hemiplegic, or unilateral cerebral palsy (affecting one side of the body) use their affected hand, when using both hands together during play. The main reasons therapists use Kids-AHA1 are to:

- Describe how a child with unilateral cerebral palsy is using their affected hand for assisting in jobs done
- Carefully plan therapy aimed at each child's level of ability
- Measure whether therapy or intervention has been effective

Kids-AHA is for children with hemiplegic cerebral palsy. There are two versions of the assessment which are used for children of different ages:

- Small-Kids AHA for younger children, aged 18 months to five-years-old
- School-Kids AHA for older children, aged six-years-old to 12-years-old.

A version for infants from age eight to 18 months old, which is called as the Mini-AHA is also available.

- Younger children. The child is presented with a series of toys in a play session. The toys have been specially selected to provoke the child to play using two hands together
- School-aged children. The child is invited to play one of two adventure-themed board games in the session. The same specially selected toys are used. Put, this time the toys are used as part of the board games. The goal remains the same to provoke the child to play using two hands together.

The child is video recorded as they play. The therapist will later score their performance from the recording. The assessment session will take between 30 – 60 minutes and includes 15 minutes for the play-based Kids-AHA assessment. It takes a further 60 minutes for a therapist to score the assessment from the video recording. Feedback about the assessment can be written in a report or given verbally depending on family preference. A written report takes approximately 30 minutes to complete and a face to face feedback session also takes approximately 30 minutes.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

3. The 2d gait analysis can be used to visually assess a person's

a. Walking style b. Spinal strength c. Posture

4. "Goal attainment Scaling" can be used by people of the age group:

a. 0-3 b. 4-10 c. any age

UNIT 3 PROVISIONS OF THERAPEUTIC INTERVENTION AND REFERRAL OF CHILDREN WITH CP

Many different types of therapeutic interventions are used for the management of individuals with cerebral palsy.

After completion of this Unit, you will be able to

- Explain various therapeutic interventions of Children with Cerebral Palsy

These interventions combine traditional physiotherapy, speech therapy, occupational therapy and other interventions like sensory integration including non traditional and complementary alternative medicine. Traditional physiotherapy has shown to improve functional capabilities especially muscle strength, local muscular endurance and overall joint range of motion to a large extent in individuals with cerebral palsy.

A. Physiotherapy

Physiotherapy deals with the rehabilitation of the muscles and the musculoskeletal system. Physiotherapy is an important part of treatment of Cerebral Palsy. Physiotherapy makes use of different types of exercises and equipments to work with muscular strength and flexibility. Physiotherapy differs for each individual and makes use of a customized, individual plan based on an individual's needs, muscular strength, range of motion and flexibility. Generally, there are two main purposes for providing physiotherapy. One is to prevent weakening and deterioration of muscles (muscles atrophy) and the other is to prevent muscles from becoming rigid in a fixed, abnormal posture (muscle contracture). Early intervention is crucial in preventing further problems and enhancing muscular flexibility and movement.

B. Speech Therapy

Children with Cerebral Palsy may have speech and communication problems. This may be caused because of insufficient muscle control causing difficulty in producing speech sounds. Some children with Cerebral Palsy may also have a hearing loss causing complications with speech articulation. Some speech therapy techniques are outlined below:

Augmentative and Alternative Communication devices

An augmentative device is a method of non verbal communication which enables children with speech delays to use an alternative means to communicate their thoughts and needs. Examples of augmentative systems are picture card readers or an electronic reader device.

Oral motor skills

This type of speech therapy focuses on strengthening the oral motor muscles by making use of activities like tongue curling, blowing bubbles or cheek puffing. These exercises increases muscle tone and control of muscles required for speech.

Articulation

This is helpful for children struggling with articulation of speech sounds. The speech therapist works with the children on how to produce different sounds and what oral muscles are involved.

C. Occupational therapy

This mode of therapy focuses on hand and finger movements, facial expressions, tongue movement and swallowing reflexes. Occupational therapists use a regimen of exercises, adaptive equipment and training to enable a child to achieve independence.

D. Psychotherapy

This type of therapy helps individuals with Cerebral Palsy practise coping skills, have better self esteem, enhance positive body image and minimize self defeating behaviors.

E. Referral process

Early identification and referrals ensure that services can be provided as immediately as possible. This ensures that there is a good opportunity to provide services and appropriate interventions as early as possible. The referral happens through many sources. Sometimes children are referred through a neurologist.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

5. The rehabilitation of the muscles and the musculoskeletal system is

a. Physiotherapy b. Occupational Therapy c. Muscular therapy

6. This type of therapy helps individuals with coping skills and gain mental strength.

a. Occupational Therapy b. Psychotherapy d. Coping therapy

UNIT 4 IMPLICATIONS OF FUNCTIONAL LIMITATIONS OF CHILDREN WITH CP IN EDUCATION AND CREATING PROSTHETIC ENVIRONMENT IN SCHOOL AND HOME

It is important to have a clear understanding of how a child has been affected by Cerebral Palsy in order to make an effective educational plan that is suitable for his or her needs. For example, it is important to understand how a child's mobility, eye hand coordination, gross and fine motor levels. This enables a teacher to set appropriate instructional goals for the classroom and an occupational therapist and physiotherapist also may set appropriate goals to address these needs in therapy.

After completion of this Unit, you will be able to

- Explain the creating prosthetic environment in school and home
- Describe the sitting posture, positioning, handling of Children with CP

Students with Cerebral Palsy will vary greatly in their ability to move in the school or home environment. Some children may be able to walk independently while some children may need an ankle foot orthoses to help maintain balance while walking and some others may use a walking frame or a walking stick or other aids. Some children may need help with carrying their school bag. Some children may use a wheelchair for mobility. Children may need modifications to the school or home environment for better mobility. Ramps and rails will greatly help children with mobility.

Children with Cerebral Palsy will have difficulty with stationary postures, transitional movements and functional mobility (Westcott and Goulet, 2005). Appropriate techniques will normalise tone, inhibit reflex activity, prevent deformity and maximise stability (Ham et al, 1998). Some children will need adaptive equipment to enhance mobility and postural control.

4.1 Sitting Posture

Good sitting posture will enable students to be prepared for the classroom tasks and to help reduce postural fatigue commonly faced by students with Cerebral Palsy.

The principles of a good sitting posture are:

- Pelvis: Symmetrical and upright with bottom well back in the seat
- Hips: Flexed (bent) at 90 degrees.
- Spine: Symmetrical with normal curves preserved.
- Head: Upright and symmetrical, not leaning over desk.
- Knees: Flexed at 90 degrees and thighs well supported on the seat.
- Feet: At 90 degrees to shin and flat on the floor
- A table at the correct height is essential. Ensure the student can rest their elbows comfortably on the table at approximately 90 degrees
- When the students sit on the floor, a good sitting posture is again encouraged for stability and balance. Some good positions include: side sitting, cross-legged or straight-legged sitting. Sitting in the “W” position or frog sitting should be strongly discouraged as it stops the hips and knees developing correctly.
- Some students with cerebral palsy need to have modifications to their school chair, so that they can sit well during the day and concentrate on their school lessons. This may include posture cushions, a pelvic belt, side supports or foot rests.

4.2 Positioning

Whether in a wheelchair or at a desk, the child should be positioned symmetrically. Pillows or bolsters made from rolled up towels or diapers are to be used to support the trunk and to center the child in the chair. Feet must be supported and never left dangling. Children should be secured in wheelchairs with a standard seat belt. Tying children into chairs restricts mobility of the upper torso, constricts breathing and even poses a safety hazard in the event the child must be removed from the chair quickly (e.g., in case of fire). The position must (a) be comfortable for work and learning, (b) minimize balance difficulties, (c) enable use of the hands to the best advantage and (d) be the easiest for eye-hand coordination. A lap board not only helps keep the child in position, but provides a working surface on which to place instruments and books. Carrying Small children without braces can be carried most easily in a way that allows arms and legs to be controlled from flinging. Pick up the child from behind, positioning your arm under the hips so that the child's knees can bend over it. Hold the child close to your body so that you can wrap your other arm around the child's shoulders to control arms that are likely to fling outward when the head is turned.

4.3 Handling

All handling techniques for individuals with cerebral palsy should first be demonstrated by a qualified person. All movements must be done slowly in utmost care. Children with cerebral palsy must be handled slowly when the child is in a relaxed position to avoid injury. To flex a child's head, gently push forward from the crown of the head, never the neck. To rotate the trunk, gently push the child's shoulder forward with the palm (not fingertips) of your hand. Move both shoulders to bring hands to the midline. This technique can also be used to open a clenched fist.

Also, to open a clenched fist, you can gently push down on the top of the child's clenched hand with the open palm of your hand.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

7. Tying children into chairs

- a. Enables children to get better stability.
- b. Restricts mobility of the torso and is a safety hazard.
- c. Enhances blood flow to the upper body parts.
- d. Inhibits infections and enhances well being.

8. Posture cushions and pelvic belts enable children to

- a. Be seated comfortably and concentrate on academic or other activities.
- b. Move around and enhance mobility.
- c. To practise bending and lifting.
- d. To practise standing for long periods of time.

UNIT 5 FACILITATING TEACHING LEARNING OF CHILDREN WITH CP

Facilitating Teaching Learning in Schools, IEP, Developing TLM, and Assistive Technology to facilitate learning and functional activities are very essential.

After completion of this Unit, you will be able to

- Explain the Individualised Education Plan
- Describe the teaching learning materials
- Illustrate Adaptation of equipment and assistive technology

Students with Cerebral Palsy may be affected by difficulties in gross motor skills, fine motor skills and communication. Children with Cerebral Palsy may need to concentrate more on their movements and hence may be prone to getting tired. It helps greatly to have activities for short periods of time with sufficient breaks to enable students to move around and adjust their position if needed. It would help greatly to understand a child's strengths and limitations and plan school activities and learning experiences that are suitable and appropriately challenging to the child.

5.1 IEP

An IEP or an Individualized Educational Plan is an important document that is unique to every child. This document includes a student's family history, educational history, diagnosis, assessment reports, educational goals, present levels of performance and progress reports. The IEP for every student is maintained by a child's teacher or case worker and should be updated on a regular basis. Typically, an IEP is developed in collaboration with the parents, teacher, other service providers like speech therapist, occupational therapist and or physiotherapist if needed. The IEP team meets at least once a year to update the progress made by the child on goals and to create new goals. Students take part in the IEP team to the extent that they are able to and are encouraged to develop their goals and discuss their progress in the school.

5.2 Developing Teaching Learning Materials

Children with Cerebral Palsy will benefit from adapting materials for their use based on their individual needs. These adaptations could include changes to buildings, facilities or materials. The variation amongst those with cerebral palsy (CP) is vast. Therefore strategies for teaching are going to look differently based on the severity of individual students' symptoms and needs. Here are some considerations while teaching children with CP:

- Instructions will need to be short and precise, since children might have short attention spans.
- Key points to be taught avoiding ambiguity.
- More than one instructional technique can be used in a lesson to cater to all learning styles.
- Teachers can display information, thus, freeing up time to engage with students who need one-on-one time.
- Having a predictable structure and routine will help the children to be aware and better prepared for the day.
- Teachers could use cues like tapping shoulders or desk to prepare students for transitions and instructional activities.
- Teachers can encourage students to make requests so that the children learn to be independent and make steps to address their needs.
- Teachers can ensure that students have their communication devices during lunch time and recess so they are able to communicate with their peers.

- Encouraging children to play modified games, so that the children with CP can participate in recess activities.(Learn Alberta, n.d.)

Strategies for Specific CP Symptoms (myhealth.alberta.ca, 2010)

Hearing Loss:

1. Talk slower and louder when necessary.
2. Provide visual aids or cues.
3. Look directly at student when having a conversation.
4. Use guided reading techniques to engage students (asking specific questions, using the pictures to guide understanding)
5. Encourage the student to utilize hearing aids, cochlear implants. If the student has them already, make sure you know how they work specifically.

5.3 Physical Considerations (Teacher Web, n.d.)

1. Consider the posture and movement abilities of the student. If the student is comfortable they will be able to learn better.
2. Some students with CP might find sitting in a desk to be uncomfortable. Give the opportunity to try out different positions, like sitting on the floor or at a table. Remember that students with CP need to change positions often to prevent muscle tension and pain.
3. Students with CP might experience muscle stiffness, encourage them to stretch and move around as much as necessary. Help the child with head positioning if they need it.
4. Students with CP typically have poor motor skills. This means that they will have issues holding on to things such as pens. Provide students with assistance with these issues, or develop an alternative way to complete assignments.
5. Because of muscle fatigue, students might become easily tired. Allow the student to rest when needed.

Gross Motor Development:

Gross motor skills are physical activities that involve whole body movement like walking, standing, jumping, running or swimming. Gross motor activities require coordination of the hands, legs and other parts of

the body. Having good gross motor skills will pave way for fine motor control.

Strategies to improve gross motor skills in the classroom:

- Provide ample opportunities for children to use large body movements like running, walking or jumping in classroom activities.
- Incorporate music and movement in learning experiences to encourage children to use their larger muscles.
- Providing children with arts and craft activities that involve using large work areas encouraging them to use their arms, legs and trunk.

Fine motor development:

A child with Cerebral Palsy may have difficulty with handwriting, cutting, pasting, drawing and colouring. A child may also have difficulty keeping the paper straight and finishing the work on time. It would help to get adaptive writing aids that may have a stronger grip, better clasp and less friction to enable a child to practise writing. A teacher could also consider making use of assistive technology aids like voice to text apps and tremor absorbing keyboards as alternatives to traditional writing.

Strategies to help improve fine motor skills in the classroom:

- Playing with sand greatly improves finger dexterity.
- Stringing beads can enhance eye hand coordination and finger control.
- Tracing and cutting artwork are good activities to improve finger manipulation and control.
- Cooking activities that include pouring, kneading, stirring and sprinkling are great for fine motor development.

5.4 Adapting Equipment:

Students with Cerebral Palsy will benefit greatly if provided with adapted materials suited to their needs. Here are some examples of adapting equipment to enable students to have more access to relevant activities in the classroom:

1. Large pencils and pens with a wider circumference are easier to hold since they open up the space between the thumb and index finger thus giving better finger control.

2. Chairs with a firm, non skid base, will enable children to be seated in a firm, stable place without the risk of slipping.
3. Tables with adjustable heights will enable children to work at a table level suitable to their needs.
4. A stabilising bar on the table enables students to rest on the table exerting weight on both their arms.
5. Non slip mat on the table top helps to keep the paper in place.
6. Slope boards can help students who tend to lean excessively on the table and also help students who have difficulty seeing their papers flat on the table.
7. Adapted scissors like spring loaded scissors, scissors with larger handle loops or self opening scissors can be used for cutting activities.
8. Rulers can be adapted by attaching a large handle to enable children to have an easier hold in the scissors.

5.5 Assistive Technology devices:

1. A communication aid can help students to express their thoughts and needs.
2. A computer can help students with written work.
3. Adapted keyboards and switches can be used in the place of a regular keyboard and mouse to enable children to use computers without much difficulty.

Most importantly, children with Cerebral Palsy just like any other child with or without disabilities will benefit from the support of teachers who believe in their inherent potential and is willing to take additional time to prepare learning opportunities suitable to a child's needs and instructional goals.

Communication:

Communication is about sharing and exchanging feelings, thoughts and ideas. Children may have difficulty with communication due to:

- Difficulty in language comprehension
- Difficulty in speech motor skills or
- Difficulty in language comprehension and speech motor skills.

For children with difficulty in speech motor skills, it will help to train children in motor skills necessary for speech (pursing, opening, swallowing and closing). It will also help to give extensive practise in speech sounds and practice tongue movements.

For children facing difficulty with language comprehension, it is important to give them explicit instruction in the meaning of question words (who/what/when/where/how/why), prepositions and exposure to lots of stories and activities to understand and practise language. Graded comprehension activities, can help children in acquiring language comprehension skills.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

9. An IEP is

- a) An Individualized Educational Plan.
- b) An Inclusive Education Protocol.
- c) An Integrated Education Program.

10. Fine motor activities are

- a) Involve larger muscles of the arms and legs.
- b) Involve finger muscles and hand movements
- c) Involve fine activities performed with motor parts of the brain.

LET US SUM UP

As with any kind of exceptionality, individuals with Cerebral Palsy are individuals first. It is important to understand each individual's unique strengths and abilities and provide an atmosphere that is conducive to their optimal progress and fulfillment. Any individual with or without a severe disability can lead a fulfilled life if the right kind of supports are provided based on their individual needs. Gaining a clear understanding

of an individual's strength and needs will enable service providers to create a stimulating and positive learning atmosphere for individuals

GLOSSARIES

- Ataxic – loss of the ability to coordinate muscular movement
- Cerebral – of the cerebrum of the brain
- Diplegia – paralysis of corresponding parts on both sides of the body
- Floppiness – to fall or sit down suddenly and heavily
- Hemiplegia – paralysis of one side of the body
- Orthotic -an artificial support or brace for the limbs or spine
- Palsy – paralysis, especially that which is accompanied by involuntary tremors
- Physiotherapy - the treatment of disease, injury, or deformity by physical methods such as massage, heat treatment, and exercise rather than by drugs or surgery.
- Posture - the position in which someone holds their body when standing or sitting:
- Prosthetic - denoting an artificial body part, such as a limb, a heart, or a breast implant
- Psychotherapy - the treatment of mental disorder by psychological rather than medical means.
- Reflexes – an action that is performed without consciousness thought as a response to a stimulus
- Spastic – relating to or affected by muscle spasm
- Strategy - a plan of action designed to achieve a long-term or overall aim
- Therapeutic – relating to the healing of disease

ANSWERS TO CHECK YOUR PROGRESS

1. a. Brain
2. b. Brain, weakness
3. a. Walking style.
4. c. Any age.
5. a. Physiotherapy.
6. b. Psychotherapy.
7. b. Restricts mobility of the torso and is a safety hazard.

8. a. Be seated comfortably and concentrate on academic or other activities.
9. a. An Individualized Educational Plan.
10. b. Involves finger muscles and hand movements.

SUGGESTED READINGS

- Miller, F. and Bachrach, S.J. (2012). *Cerebral Palsy: A Complete Guide for Caregiving*. A Johns Hopkins Press Health Book.
- Sarva Siksha Abhiyan. Module on Cerebral Palsy. http://ssa.nic.in/inclusiveeducation/training-module-for-resource-teachers-for-disablechildren/Module%205%20Cerebral%20Palsy.pdf/at_download/file
- Sarva Siksha Abhiyan . Module on Multiple Disabilities. http://ssa.nic.in/inclusiveeducation/training-module-for-resource-teachers-for-disablechildren/Module%203%20Multiple%20Disability.pdf/at_download/file

BLOCK 2 AMPUTEES, POLIO, SPINAL CORD INJURIES SPINA-BIFIDA AND MUSCULAR DYSTROPHY

Structure

Introduction

Objectives

Unit 6 Definition, Meaning and Classification

6.1 Amputation

6.2 Polio

6.3 Spinal Cord Injuries

6.4 Spina Bifida

6.5 Muscular Dystrophy

Unit 7 Assessment of Functional Difficulties

7.1 General Guidelines to performing functional assessments

7.2 Assessment of functional difficulties in amputees

7.3 Assessment of polio

7.4 Assessment spinal cord injuries

7.5 Assessment of spina bifida

7.6 Assessment of muscular dystrophy

Unit 8 Provision of Therapeutic Intervention and Referral

8.1 Provision of therapeutic intervention and referral of Amputees

8.2 Provision of therapeutic intervention and referral of individuals with polio

8.3 Provision of therapeutic intervention and referral of individuals with spinal cord injuries

8.4 Provision of therapeutic intervention and referral of individuals with spina bifida

8.5 Provision of therapeutic intervention and referral of individuals with muscular dystrophy

Unit 9 Implications of Functional Limitations for Education and Creating Prosthetic Environment in School and Home

9.1 Considerations for a barrier free environment

9.2 General goals of seating and positioning

9.3 Seating arrangements and mobility aids

9.4 Guidelines to measure for a child's seat

9.5 Mobility aids

Unit 10 Facilitating Teaching-Learning: IEP, Developing TLM;
Assistive technology

10.1 IEP

10.2 Developing TLM

10.3 Assistive Technology

Let Us Sum Up

Glossaries

Answers to Check Your Progress

Suggested Readings

INTRODUCTION

This Block gives in depth information on amputations, polio, spinal cord injuries, spina bifida and muscular dystrophy. The Block will discuss definitions, causes and types of each of the above mentioned conditions. This Block will also address ways to assess functional difficulties in children with these conditions and different types of therapeutic interventions. The final part of the Block will talk about methods and strategies to be adopted that will enhance the overall development of individuals with these conditions in all the domains of development. It will be beneficial for the students to visit the provided websites for more information on these conditions.

OBJECTIVES

After studying this unit, students will be able to:

- Explain the nature of amputations, polio, spinal cord injuries, spina bifida and muscular dystrophy.
- Understand different ways to assess functional difficulties in children.
- Explain the various types of therapeutic interventions available for individuals with amputations, polio, spinal cord injuries, spina bifida and muscular dystrophy including physiotherapy and occupational therapy.
- Implement seating, positioning and handling techniques that will enhance their mobility and reduce postural fatigue.

UNIT 6 DEFINITION, MEANING AND CLASSIFICATION

Teachers are expected to plan an effective therapeutic and programme and also refer for medical intervention whenever necessary.

After completion of this Unit, you will be able to

- Identify amputees, polio, spinal cord injuries, spina-bifida and muscular dystrophy
- Explain the causes, types of these conditions

6.1 Amputation

Amputation Definition:

Amputee: The amputation coalition defines amputation as the surgical removal of a limb due to complications associated or trauma.

Causes of Amputation

Poor circulation: Tissue can die or get infected when there is very poor circulation to the extremities.

Severe Injury:

When a limb suffers injury beyond recovery or medical intervention, this may lead to amputation. This could happen due to burn injuries or severe accidents.

Infections that do not get better:

A wound can get severely infected and not heal when proper medication is not given or when the body does not respond to medication. The unhealed wounds can result in dead tissues resulting in amputation. This is commonly seen in diabetic patients who may have unhealed wounds.

Types of Amputation:

Amputations can be classified as lower limb amputations and upper limb amputations.

Lower limb amputations:

Lower limb amputations vary from the partial removal of a toe to the loss of the entire leg and part of the pelvis. The following list provides a summary of the typical forms of lower limb amputation.

Partial Foot Amputation	This includes removal of one or more toes.
Ankle Disarticulation	Removal of the foot at the toe.
Below knee amputations (trans tibial)	An amputation of the leg below the knee that retains the use of the knee joint.
Through the knee amputation	The removal of the lower leg and knee joint. The remaining stump is still able to bear weight as the whole femur is retained
Above the knee amputation	Amputation of the leg above the knee joint.
Hip disarticulation	The removal of the entire limb up to and including the femur.
Hemipelvectomy (transpelvic)	The removal of the entire limb and the partial removal of the pelvis

Upper limb amputations:

Upper limb amputations vary from the partial removal of a finger to the loss of the entire arm and part of the shoulder. The following list provides a summary of the typical forms of upper limb amputation.

Partial hand amputation - The loss of a thumb inhibits the ability to grasp, manipulate or pick up objects grasping ability.	Amputations can include fingertips and parts of the fingers. The thumb is the most common single digit loss.
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Metacarpal Amputation	This involves the removal of the entire hand with the wrist still intact
Wrist disarticulation	This form of amputation involves the removal of the hand and the wrist joint

Amputation classification source: www.limbless-association.org

6.2 Polio

Polio Definition:

WHO defines Poliomyelitis (polio) as a highly infectious viral disease, which mainly affects young children. The virus is transmitted by person-to-person spread mainly through the faecal-oral route or, less frequently, by a common vehicle (e.g. contaminated water or food) and multiplies in the intestine, from where it can invade the entire nervous system and can cause paralysis.

Causes of Polio:

Polio is a highly infectious disease caused by a virus. It invades the nervous system and can cause total paralysis in a matter of hours. The virus is transmitted by person-to-person and is spread mainly through the faecal-oral route or, less frequently, by a common vehicle (for example, contaminated water or food) and multiplies in the intestine. Initial symptoms are fever, fatigue, headache, vomiting, stiffness of the neck and pain in the limbs. 1 in 200 infections leads to irreversible paralysis (usually in the legs). Among those paralysed, 5% to 10% die when their breathing muscles become immobilized.

Types of Polio:

Polio can be classified based on the location it affects. They are as follows:

Spinal Polio: This condition affects the spinal system although the brain and spinal cord are not affected. It is not a severe form of polio and does not cause any symptoms.

Bulbar Polio: This affects the brainstem or central nervous system. This condition does not cause paralysis.

Bulbospinal: This condition affects the spine and brainstem. This condition results in paralysis of body parts and severe disorders.

“There are 3 types of wild poliovirus (WPV) - types 1, 2 and 3. In September 2015, WPV type 2 was officially declared eradicated. Since WPV type 3 has not been detected since November 2012, WPV type 1 is probably the only wild poliovirus type that remains in circulation.”
Source: World Health Organization.

6.3 Spinal Cord Injuries

Definition of Spinal Cord Injuries:

Mayo Clinic defines spinal cord injury as damage to any part of the spinal cord or nerves at the end of the spinal canal (cauda equina) which often causes permanent changes in strength, sensation and other body functions below the site of the injury.

Causes of Spinal Cord Injuries:

Spinal cord injuries may be caused due to falls, injuries due to accidents or sports.

Types of Spinal Cord Injuries:

Spinal cord injury can be classified based on the severity of the injury also referred to as “completeness” of the injury.

Complete: The injury is termed “complete” if all motor function and ability to control movement is lost below the spinal cord.

Incomplete: The injury is termed incomplete if there is some loss of motor or sensory functions is lost below the spinal cord.

Spinal cord injuries can also be classified based on the part of the **Body that is affected:**

Tetraplegia: When the arms, hands, trunk, legs and pelvic organs are all affected, this is known as tetraplegia or quadriplegia.

Paraplegia: This condition affects all parts of the trunk, legs and pelvic organs.

6.4 Spina Bifida

Definition of Spina Bifida:

Spina bifida, is described as a congenital defect of the vertebral arches in the spinal column (Rodgers et al 1998) whereby the neural tube fails to unite therefore exposing a gap over which the skin is defective (Ham et al 1998).

Causes of Spina Bifida:

Spina Bifida is present before birth and is caused due to the embryonic neural tube being incompletely closed. The defect to this tube causes this condition.

Types of Spina Bifida:

There are four types of spina bifida based on the characteristics of the malformation:

Occulta: This is the mildest and most prevalent type. In this condition, one or more bones of the vertebrae are not properly formed. The opening in the spinal cord is covered by a skin layer. This condition does not cause any disability.

Closed neural tube defects: In this condition, the spinal cord is marked by a malformation of fat, bone or membranes. In some cases, the malformation can cause partial paralysis with urinary or bowel problems.

Meningocele: The meninges is the protective covering around the spine. In this type, the meninges pushes out from the spinal opening and may or may not be covered by a layer of skin. Some individuals may experience partial paralysis.

Myelomeningocele: In this condition, the spinal cord shows through the opening resulting in partial or complete paralysis of the body below the spinal opening. Individuals with this condition are unable to walk and may have urinary or bowel dysfunction.

6.5 Muscular Dystrophy

Muscular Dystrophy Definition:

Muscular dystrophy is a group of diseases that cause progressive weakness and loss of muscle mass. In muscular dystrophy, abnormal genes (mutations) interfere with the production of proteins needed to form healthy muscle. (Definition by Mayo Clinic)

Causes of Muscular Dystrophy:

The causes are genetic. A family history of muscular dystrophy increases the possibility of occurrence in an individual. Genetic mutations can cause muscular dystrophy. The mutations impede the production of muscle proteins that are needed to build and maintain healthy muscles.

Types of Muscular Dystrophy:

Duchenne muscular dystrophy: The most common form of the illness. Symptoms normally start before a child's third birthday.

Becker muscular dystrophy: Similar symptoms to Duchenne but with a later onset and slower progression.

Myotonic (Steinert's disease): This is the most common adult-onset form. It is characterized by an inability to relax a muscle once it has contracted. The muscles of the face and neck are often affected first.

Congenital: This type can be obvious from birth or before the age of 2 years. It affects girls and boys.

Facioscapulohumeral (FSHD): Onset can be at almost any age but is most commonly seen during teenage years. The muscular weakness often begins in the face and shoulders. People with FSHD may sleep with their eyes slightly open and have trouble fully closing their eyelids.

Limb-girdle: This variant begins in childhood or teenage years and first effects the shoulder and hip muscles. Individuals with the limb-girdle muscular dystrophy might have trouble raising the front part of the foot, making tripping a common problem.

Oculopharyngeal muscular dystrophy: Onset is between the ages of 40 and 70 years. Eyelids, throat, and face are first affected, followed by the shoulder and pelvis.

Source: <https://www.medicalnewstoday.com/articles/187618.php>

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

1. When a limb suffers injury beyond medical repair or recovery, this may lead to _____.
 - a. polio
 - b. Amputation
 - c. spina bifida
2. This type of polio virus was officially eradicated in September 2015.
 - a. WPV Type 1
 - b. WPV Type 2
 - c. WPV Type 3

UNIT 7 ASSESSMENT OF FUNCTIONAL DIFFICULTIES

The children with Cerebral Palsy will have certain functional difficulties related to amputee, polio, spinal cord injuries, spina-bifida and muscular dystrophy.

After completion of this Unit, you will be able to

- describe the assessment of functional difficulties of various types of CP
- apply the knowledge at the required situations

7.1 General guidelines to performing functional assessments

Functional assessments are performed to get an accurate understanding of a person's strengths and specific areas of need. It is very important to use standardized assessment tools and carefully record observations. It is also extremely important to involve other professionals from the multidisciplinary team to get a comprehensive picture of what is needed. In this subunit, we will discuss at least one standardized assessment tool to measure functional difficulties in individuals with various locomotor conditions:

7.2 Assessment of functional difficulties in amputees

The following tests can be used to assess functional levels in individuals with mobility challenges

2 mwt (2 minute walk test): The 2MWT is a measurement of endurance that assesses walking distance over two minutes. The test measures aerobic capacity, functional mobility and gait. This test can be used with individuals who have suffered limb loss, multiple sclerosis or spinal injuries.

6mwt (6 minute walk test): The 6 Minute Walk Test is a sub-maximal exercise test used to assess aerobic capacity and endurance. The distance covered over a time of 6 minutes is used as the outcome by which to compare changes in performance capacity.

TUG (Timed Up and Go) test : To determine fall risk and measure the progress of balance, sit to stand and walking.

AMP (Amputee Mobility Predictor): Amputee mobility predictor (AMP) is a quick and easily administered assessment tool designed to measure the functional status of lower-limb amputees with (AMPPRO) and without (AMPnoPRO) the use of a prosthesis.

Wolf Motor Function Test: The WMFT is a quantitative measure of upper extremity motor ability through timed and functional tasks. It measures dexterity, strength and upper extremity function in individuals.

LEFT: Upper Extremity Function Test

The Upper Extremity Function Test (UEFT) is an evaluative measure to assess upper extremity functional impairment and the severity of impairment in patients exhibiting dysfunction in the upper extremity.

7.3 Assessment of functional difficulties in polio

Assessment is the most important step in understanding an individual's abilities and needs and then creating an appropriate intervention plan. In the process of assessment, it is crucial to ask how an individual performs an activity instead of if an individual performs an activity. A tool called "My Polio Life" is a valuable self assessment tool that can give a lot of detailed information on an individual's quality of life. A multi disciplinary assessment can help with getting comprehensive information across several domains of an individual's life.

7.4 Assessment of functional difficulties in individuals with spinal cord injuries

The Functional Independence Measure (FIM) is an important assessment tool for individuals with spinal cord injuries. This tool gives

the functional status of a person based on the level of assistance he or she receives. The tool grades if activities are done with total independence or level of assistance required. FIM measures bowel and bladder control, locomotion, communication, social cognition as well as the following self care activities: such as feeding, grooming, bathing, upper body dressing, lower body dressing and toileting. The FIM measures what an individual can perform and not what that person could do under certain circumstances.

7.5 Assessment of functional difficulties in individuals with spina bifida

The Pediatric Evaluation of Disability Inventory can be used to analyze functional capabilities in infants and children who are six months to seven years old. The test measures capabilities in daily activities, mobility and social cognitive areas.

7.6 Assessment of functional difficulties in individuals with muscular dystrophy

The motor function measure is a measurement scale for neuromuscular diseases. This tool can be used to evaluate the effectiveness of therapeutic measures. This tool measures an individual's ability to perform different motor functions.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

3. AMP is

- a. Ambulatory Mobile Parameter.
- b. Amputee Mobility Principle.
- c. Amputee Mobility Predictor.

4. UEFT is

- a. Upper Execution Function Test.
- b. Upper Extremity Fall Test
- c. Upper Extremity Function Test.

UNIT 8 PROVISION OF THERAPEUTIC INTERVENTION AND REFERRAL

It is crucial to provide therapeutic interventions in order to maximise an individual's well being and to enhance their well being, independence, functional and life roles. This also enables individuals to maximise their potential and enjoy their daily life.

After completion of this Unit, you will be able to

- Explain the importance of therapeutic intervention
- Describe the provisions for therapeutic intervention
- Narrate the referral services

8.1 Provision of therapeutic intervention and referral of amputees

Pre-prosthetic intervention:

This may be required to provide strategies, intervention and support to manage phantom limb pain, support with body image and to prepare for the life changes due to amputation.

Post-prosthetic intervention:

This support will ensure maximal functional outcome with the prosthesis including maximising use of the prosthesis and wearing and taking off the prosthesis.

Physiotherapy:

The physio therapist will focus on ensuring optimum physical range of movement and strength. They will also focus on preventing issues in unaffected parts, limiting over use and management of support with phantom limb pain.

Occupational Therapy:

Occupational Therapy may involve assessing, adapting and modifying home or other environments to facilitate participation (College of Occupational Therapists 2011). Occupational therapists also assess return to work readiness, supports needed at work, capacity and building motivation.

Psychotherapy:

Counselling will address grief related to loss of a limb and body image issues. Counselling may extend over a period of time to ensure that an individual is provided maximum support to cope with the amputation.

8.2 Provision of therapeutic intervention and referral of individuals with polio

Physiotherapy:

Physiotherapy can be very effective in providing the needed supports to individuals with polio or post polio syndrome. Physiotherapy focuses on cardiopulmonary exercises. Intense exercises can further weaken than strengthen the muscles and hence it is better to focus on cardio exercises than strength training. Physiotherapy provides information on specific muscle groups to be included, excluded and the type of exercises needed.

Occupational Therapy:

Many polio patients and survivors experience heavy weakness and fatigue which affects their functional ability. The role of the occupational therapist is to provide ongoing support and strategies to regain functional ability.

8.3 Provision of therapeutic intervention and referral of individuals with spinal cord injuries

Physiotherapy

Physiotherapists work mainly on the recovery of motor functions in the zone of injury. A physiotherapist conducts pre assessment before beginning therapy to set appropriate and realistic goals and ongoing assessment to understand performance of motor tasks and to understand an individual's range of motion over time. Physiotherapy during the rehabilitation phase focuses on motor tasks such as walking, pushing a wheelchair, transferring and using the upper limbs.

Occupational Therapy

The goal of occupational therapy is to enable individuals to return to productive lives. Occupational therapists have the skill set to enable goal setting based on physical, psychological, occupational and contextual factors that impact occupational performance. The occupational therapist ensures that an individual can contribute meaningfully in home and community and engage in meaningful work.

Psychotherapy:

The main goal of counselling in patients with spinal cord injuries is processing emotions, emotional adjustment or family coping. Psychologist assesses a person's strengths in cognition, mood and

behavior and then makes therapeutic goals based on an individual's strength and needs.

8.4 Provision of therapeutic intervention and referral of individuals with spina bifida.

Physiotherapy:

Physiotherapy for children with spina bifida uses very basic techniques which include prophylactic and therapeutic 'stretching', training to walk, supervision of calipers and instruction to the parents. Success or failure of treatment very largely depends on the ability of the physiotherapist to teach and encourage the parents to help the child become as independent as possible in all aspects of daily living.

Occupational Therapy:

Occupational therapists enable individuals to enhance their participation and independence in everyday activities such as self care, school and play. The occupational therapist also enables individuals to explore their surroundings and environment and achieve optimal functional independence.

Psychotherapy:

Counselling can help individuals with coping with the condition and to work on a positive body image. Counselling can also help with enabling children to advocate for their needs and strengths and build resiliency.

8.5 Provision of therapeutic intervention and referral of individuals with muscular dystrophy

Physiotherapy:

Physiotherapists can help with management of the presenting neuromusculoskeletal problems. They can help slow the regression of range of motion, muscle strength, daily function, work to improve gait pattern and posture/alignment. Physiotherapy can also address the pain that the patient may be experiencing. Physiotherapists often implement stretching programs for DMD patients. A stretching program can be a combination of passive range of motion, active range of motion and active assisted range of motion. It is suggested that stretching will help the patient cope with decreased muscle extensibility and muscle contractures. Regular stretching of the ankle, knee and hip is necessary throughout the course of a patient's life.

Occupational Therapy:

An occupational therapist can assist an individual in work readiness skills. An occupational therapist can work to improve handwriting, balance, coordination, adapting seating and equipment and providing wheelchair assessment.

Psychotherapy:

An individual may feel overwhelmed or guilty after receiving a diagnosis of muscular dystrophy. Counselling can help in identifying the emotions felt and processing them in a healthy way. The aim of counselling is to help individuals find solutions on their own and to gain mental clarity to make decisions.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block

5. This helps to identify complex emotions and work through them.

a. counselling b. physiotherapy c. occupational therapy

6. This provides support to address phantom limb pain.

a. Pre prosthetic intervention b. Post prosthetic intervention.

. c. physiotherapy

UNIT 9 IMPLICATIONS OF FUNCTIONAL LIMITATIONS FOR EDUCATION AND CREATING PROSTHETIC ENVIRONMENT IN SCHOOL AND HOME

The children with Cerebral Palsy are also to be included into normal stream. Hence, based on the functional limitations for education, the prosthetic environment is to be created at school as well at home

After completion of this Unit, you will be able to

- Describe the barrier free environment

9.1 Considerations for a barrier free environment

The following aspects will need to be considered while planning for a barrier free environment for individuals with locomotor problems who use a wheelchair or a walker or a crutch:

- Access in and around schools
- Being able to get on and off transportation by manipulating ramps and seatbelts
- Using the toilet, furniture and playground
- Being able to drink and eat
- Creating a supportive environment at school by changing the attitude of other students and staff.

The above aspects can be addressed by:

- Creating a supportive policy for all children in the school.
- Ensuring that the ramp is of the right gradient
- Providing graded steps and handrails in passageways and walkways for continuous movement.
- Wide doors in hallways and restrooms for wheelchair access.
- Orientation of peers and school staff to proper use of crutches and assistive devices and wheelchairs.
- Accessible playground to all, unobstructed slip resistant flooring and corridors for easy access and movement.
- Providing appropriate furniture for children with disabilities to enable comfortable seating and use.
- Instilling a sense of responsibility and positive attitude in peers and school staff so the children feel welcome and are involved in all social activities in the school in a positive manner.

9.2 General goals of seating and positioning

- 1) Normalise tone or decrease abnormal influence on the body.
- 2) Maintain skeletal alignment.
- 3) Prevent, accommodate or correct skeletal deformity.
- 4) Provide stable base of support to promote function.
- 5) Promote increased tolerance of desired position.
- 6) Promote comfort and relaxation.
- 7) Facilitate normal movement patterns or control abnormal movement patterns.
- 8) Manage pressure or prevent the development of pressure sores.
- 9) Decrease fatigue
- 10) Enhance autonomic nervous system function (cardiac, digestive and respiratory function)

11) Facilitate maximum function with minimum pathology.

(Jones and Gray 2005).

9.3 Seating arrangements and mobility aids

Some children with locomotor problems may not be able to sit without support. The level of support needed, varies with the type and severity of disability. For children with head control difficulties, a special chair may be needed to help keep their body straight and attain optimum physical ability. Special furniture can enable individuals to feel more supported, secure, stable and enable optimal performance and functional efficiency. Special furniture needs to be checked with time to ensure that they continue to meet the child's needs and are suitable for the child's changing body. It is essential that postures may be changed from time to time so that there is circulation and the child does not become stiff.

9.4 Guidelines to measure for a child's seat

- The child will need to be seated on a low stool.
- The feet should comfortably rest on the floor.
- A child can be supported to sit straight, if he cannot sit by himself, so that he has his back and head straight.
- The seat length will be from the child's back to where the child's knee ends.
- The seat width will be the width of the child's back plus two inches.
- The height of the back of the seat will be from the stool to the top of the shoulders in case a child is able to balance his or her head and from the stool to the top of the head in case a child needs head support.
- The arm rest will be from the stool to two inches above the child's waist.
- The height of the seat from the floor will be the distance from the back of the knee to the floor when the child is sitting with knees at right angles.
- A floor seat gives support at the back and sides when the head is not steady. A floor seat can be made similarly without adding the height of the seat from the floor for floortime activities.
- A box seat is made similar to the floor seat at a higher level for a child who does not sit on the floor.

- A potty seat can be used with a backrest for children who have unsteady sitting balance. This ensure privacy and support without being held by anyone.
- Some children experience tightness between their legs and their legs cannot be separated. These children can be provided with a pomell on their seating. A pommel is a cylindrical block of wood, 6 inches high and 2 inches in diameter which is padded with foam or rexine and secured about 1 inch from the child's groin in the seat. The pomell prevents a child from being thrust forward in case of difficulties with balancing.
- A ramped seat enables a child to sit in the seat and rest their legs on a raised platform. This prevents the child from pushing forward and provides balance.
- A pelvic strap provides added stability and support to children who tend to push forward in their seat.

9.5 Mobility Aids

Some children need mobility aids in order to move. Mobility aids help these individuals in achieving maximum functional capacity.

Wheelchairs: There are different types of wheelchairs that are available these days. The wheelchair should be of an appropriate height and should have the leg rest at the most suitable height for the child. The wheelchair must have adjustable seat straps that can be tied comfortably on the child.

Cut out tray: This tray can be fitted on a wheelchair and gives children balance and support while eating or working on any hand activities.

Crutches: Crutches provide stability and support while walking. Elbow crutch provides support with a round ring for the arms. Some elbow crutches have a small handle that provide support from behind the forearm.

Walking sticks: Walking sticks provide support and stability while walking. It can also be used as a crutch one side.

Kaye Walker: Kaye walkers are useful for children who have a tendency to bend their knees or hips while walking.

Rollator: This type of walker has large wheels, a handle bar and a built in seat. This is used by individuals who tend to need more support to walk and tend to fall backwards while walking.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

7. The pomell

- a. prevents a child from being thrust forward in case of difficulties with balancing.
- b. Is used to teach children to jump.
- c. Is the footrest in a chair used to provide balance.

8. This walker has large wheels, a handle bar and a built in seat.

- a. rollator
- b. Kaye walker
- c. crutches

UNIT 10 FACILITATING TEACHING-LEARNING

To create a best teaching learning environment to the children with Cerebral Palsy, we should know about Individualised Education Plan.

After completion of this Unit, you will be able to

- explain the Individualised Education Plan
- Describe the assistive devices

10.1 IEP

An IEP is an Individualized Education Program. This document outlines the educational plan for a student and includes the following:

- **Present Levels of Performance (PLOP)** The PLOP section of the IEP contains the current levels of functioning of a student in academic and non academic areas at school.

Goals: This part details the annual goals for the student. Goals for students need to be Specific, Measurable, Achievable, Result oriented and Time Bound (SMART).

Progress Report: The progress report section outlines the progress made by a child on each goal.

Assessments:

The IEP also includes assessment information from the child's service providers including psychologist (assessment done every three years), special education teacher and the following service providers if the child receives services from them. They are as follows:

speech therapist,

occupational therapist,

AAC specialist (Assistive and Augmentative Communication),
behaviour specialist,

physiotherapist and

adaptive PE teacher.

Vision, hearing assessment records

Medical history and immunization records.

➤ **Common needs of children with locomotor disabilities:**

- Difficulty using the school facilities (classrooms, hallways, restrooms, playground).
- Difficulty accessing classroom environment and materials.
- Difficulty completing daily living activities like eating, dressing or using the restroom.
- Participating in physical education activities.
- Completing tasks that require a motor response.

➤ **Writing the IEP:**

The goals and objectives must be based on the current educational needs of the student. It is also important to address organization and planning, independence and self advocacy skills in the IEP. In case of progressive conditions like Duchenne Muscular Dystrophy, it may not be appropriate to write goals and objectives that reflect an increase in skill. Instead, the goals and objectives could focus on student's ability to understand the implications of the diagnosis, getting help to meet his needs and understanding and making use of accommodations and

resources that are available. Goals and objectives need to be realistic based on student's needs and functioning.

➤ **Accommodations and Modifications:**

a. Accommodations

This is an essential part of the IEP and will need a thorough understanding of a child's needs and careful understanding of how the child's disability interferes with educational progress in a school setting. Accommodations are changes that help a student overcome or work around challenges. The supplementary aids and services received by the child are listed here.

Examples of accommodation: Providing longer time to complete a test and permission to take breaks in between a test, permission to use a word processor instead of paper and pen.

b. Modifications:

"Modifications are often defined as a change in what is taught to or expected from the student. Adapting or modifying the content, methodology and/or delivery of instruction is an essential component of special education and should be carefully considered by the educational team before implementation, particularly if the student's educational needs are complex."

(Source: Minnesota Physical Impairments Manual, 2011).

Some examples of modification are, Modifying the content of the lesson, modifying an assignment or modifying course requirements.

c. Evaluations:

Adaptations To Evaluations Accommodating Learners with Physical Impairments:

Outlined below are some adaptations that can be used for evaluating learners with physical impairments:

- Alternative presentation format.
- Reading directions or text.
- Presenting complex directions in smaller, sequential increments.
- Modification of test materials or administration.
- Limiting the amount of test items presented.
- Enlarging test items or making the test clearer perceptually.
- Rearranging test items Providing time extensions or eliminating time variable.

- Allowing shortened test sessions or more frequent breaks.
- Alternative response formats, Pointing Eye-gazing Dictating response.
- Interpreting of response by person familiar with learner's communication.
- Using an augmentative communication device.
- Changing to multiple-choice format and enlarging the test protocol to provide more space for writing.
- Using word processing to complete writing tasks or tests, if appropriate.
- Using compensatory software such as word prediction, voice input, or text to speech.
- Using calculator If adaptations are used in test administration, these need to be documented in the discussion of the test results and interpretation.

Many of these adaptations would result in a significant change in the administration and standardization of the test. The validity of the results needs to be carefully weighed when making educational decisions.

There are several cognitive tests that do not require a verbal response or motor response (except to point):

- Test of Nonverbal Intelligence III (TONI)
- Comprehensive Test of Nonverbal Intelligence

(Source: Minnesota Physical Impairments Manual, 2011).

Informal Evaluation:

When evaluating students with physical impairments, the informal evaluation process is one of a number of multi-method assessment procedures. This is of particular importance due to the difficulties encountered in traditional testing of students with a physical impairment. The presented purpose is to provide the Physical/Health Disabilities teacher and the student's respective educational team a set of acceptable informal techniques that should be considered during the evaluation process. Identifying students who have physical impairments as eligible and in need of special education services typically requires norm-referenced testing, while evaluations conducted for educational planning purposes utilize a variety of assessment procedures which may or may not include traditional norm-referenced testing.

The purpose of conducting an informal evaluation:

When a typical motoric and/or verbal responses do not allow the use of standardized measures, confirm or dispute information obtained from other formal and objective evaluation procedures. Collect data not addressed or available with other formal assessment measures obtain informal information on how the student functions relative to his/her physical impairment in various settings

10.2 Developing TLM

Teaching Learning Materials (TLM) are those materials used by teachers in the classroom to achieve specific learning goals. Teachers choose materials that enable students to understand the lessons through experience or manipulation. These materials greatly support student learning and ensure student success. These materials help the students understand concepts and gain a real world understanding of what is being taught. Teaching learning materials enable students to apply knowledge in the real world.

Example:

- Using blocks to teach counting, addition or subtraction.
- Using picture cards to teach beginning sounds, middle sounds and ending sounds in phonic lessons.
- Using maps to show the location of different continents in a social studies lesson.
- Use of teaching learning materials gives students a concrete experience of the abstract lessons being taught.
- The use of videos and experiments in Science would also fall in this category.

Other examples of teaching learning aids are clay, photographs, posters, transparencies, powerpoint presentations, specimens and charts.

10.3 Assistive Technology

IDEA 2004 defines assistive technology as 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 the functional capabilities of children with disabilities. Assistive technologies range from paper graphic organisers to smart phone apps

that enable students to learn effectively. These aids enable students of all abilities to learn effectively.

Here are some examples of assistive technology:

Text to speech assistive tools - This is used for students who are unable to read due to blindness, impeding motor conditions or other factors. The technology works by scanning and reading the words to the student through a synthesised voice. Through the advances in technology, the voice is lifelike and realistic.

Intel Reader:

This is a mobile hand held device that reads printed text aloud. The high resolution camera captures printed text, converts it to digital text and then reads aloud. It has a feature that enables readers to highlight words that are read aloud and the reader can spell the highlighted words.

Kurzweil 3000

This is a text to speech software with a range of features:

- Multiple TTS voices
- Support for 18 languages and dialects
- Talking spell-checker
- Picture dictionary graphics for more than 40,000 words
- Text magnification

Some more assistive technology devices:

- Writing and grip aids
- Triangle pencil for better grasp
- Pencils with varying thickness
- Varying writing implements like crayons, colored pencils, fine markers.
- Slant board so individuals can write on an easel stand without worrying about the paper slipping away.
- Raised line paper.
- Textured material under the paper.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

9.PLOP in an IEP is

- a) Present Level of Performance.
- b) Performance Level of Present.
- c) Present Objective of Progress.

10.A change to what is being taught or expected of the student.

- a) Modification
- b) Adaptation
- c) Transaction.

LET US SUM UP

Individuals with motor impairments face several challenges in life due to the nature of their conditions. The right intervention at the right time based on a thorough assessment can make a great difference in enhancing the quality of life of individuals with locomotor impairments. It is of paramount importance that service providers and teacher students take the time to understand an individual's needs and work with them to provide the most appropriate and suitable service that can enhance their quality of life.

GLOSSARIES

- Amputation - the action of surgically cutting off a limb
- Dystrophy - a disorder in which an organ or tissue of the body wastes away:
- Limb - an arm or leg of a person or four-legged animal, or a bird's wing
- Muscular - relating to or affecting the muscles
- Polio - a disabling and life-threatening disease caused by the poliovirus
- Prosthetic - denoting an artificial body part, such as a limb, a heart, or a breast implant:
- Referral - an act of referring someone or something for consultation, review, or further action.

ANSWERS TO CHECK YOUR PROGRESS

1. b. amputation
2. b. WPV 2
3. c. Amputee Mobility Predictor.
4. c. Upper Extremity Function Test.
5. a. Counselling
6. a. Pre prosthetic intervention
7. c. prevents a child from being thrust forward in case of difficulties with balancing.
8. a. rollator.
9. d. Present Levels of Performance.
10. a. Modification.

SUGGESTED READINGS

- Miller, F. and Bachrach, S.J. (2012). *Cerebral Palsy: A Complete Guide for Caregiving*. A Johns Hopkins Press Health Book.
- Sarva Siksha Abhiyan. Module on Cerebral Palsy. http://ssa.nic.in/inclusiveeducation/training-module-for-resource-teachers-for-disablechildren/Module%205%20Cerebral%20Palsy.pdf/at_download/file
- Sarva Siksha Abhiyan . Module on Multiple Disabilities. http://ssa.nic.in/inclusiveeducation/training-module-for-resource-teachers-for-disablechildren/Module%203%20Multiple%20Disability.pdf/at_download/file

INTRODUCTION

This Block gives in depth information on multiple disabilities, epilepsy, motor and sensory conditions, leprosy, tuberous sclerosis and multiple sclerosis.

The Block will discuss definitions, classification and characteristics of each of the above mentioned conditions. This Block will also address implications of functional limitations in school and home and discuss seating arrangements, positioning and handling techniques that will enable them to have optimal efficiency. The final part of the unit will talk about providing a conducive teaching learning atmosphere through IEPs, Teaching Learning Materials and Assistive Technology Devices. There are revision questions at the end of the unit. It will be beneficial for the students to visit the provided websites for more information on these conditions. An IEP template has been provided as an annexure for student use and practice.

OBJECTIVES

After studying this unit, students will be able to:

- Explain the nature, causes and characteristics of multiple disabilities, epilepsy, motor and sensory conditions, leprosy, tuberous sclerosis and multiple sclerosis.
- Understand implications of functional limitations and
- Implement seating, positioning and handling techniques that will enhance their mobility and reduce postural fatigue.
- Understand the importance of an IEP, developing appropriate teaching learning materials and using assistive technology for these students.

UNIT 11 MULTIPLE DISABILITIES: MEANING AND CLASSIFICATION

This Unit intends to develop required skills in teacher trainee to identify the children with locomotor and multiple disabilities and also plan an effective programme education as well as for creating awareness on these conditions.

After completion of this Unit, you will be able to

- Explain the multiple disabilities and dissociated conditions

- Describe implications of functional limitations for education
- Facilitate the teaching learning programmes

11.1 Definition of multiple disabilities.

Persons with multiple disabilities have a combination of two or more serious disabilities (eg. cognitive, movement, sensory). Example: Intellectual Disability with Cerebral Palsy, Cognitively Impaired with blindness and Cognitively Impaired with orthopaedic impairment.

The U.S. Federal Government defines multiple disabilities as individuals with more than one impairment, the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments.

The term “multiple disabilities” does not include deaf blindness earlier. But the Rights of Persons with Disabilities Act, 2016 described the Multiple Disabilities (more than one of the specified disabilities) including deaf blindness which means a condition in which a person may have combination of hearing and visual impairment causing severe communication, developmental, and educational problems.

11.2 Causes of multiple disabilities

- Lack of oxygen at birth.
- Chromosomal abnormalities.
- Premature birth.
- Difficulties after birth.
- Poor development of the brain or spinal cord.
- Infections
- Genetic Disorders.
- Injuries from accidents.

11.3 Types of multiple disabilities

Individuals with multiple disabilities often need support with major life activities. These activities are:

- caring for oneself

- performing manual tasks
- seeing, hearing, eating, and sleeping
- walking, standing, lifting, and bending
speaking and communicating
- breathing
- learning
- reading
- concentrating and thinking and
- working

11.4 Characteristics of Multiple Disabilities:

Common Characteristics of Individuals with Multiple Disabilities one as follows

Students with multiple disabilities have unique characteristics with respect to the following domains:

Intellectual Functioning: Most students with multiple disabilities tend to have many challenges with their intellectual functioning. Due to the unique combinations of challenges, students tend to have very different academic strengths and challenges.

Adaptive Skills: These skills include conceptual, social and practical competencies for functioning in a typical community setting that matches with an individual's age.

Motor Development: Students have difficulty sitting or moving and show muscle tone abnormality.

Sensory Functioning: Individuals with multiple disabilities have difficulties with one or more of their sense faculties of sight, sound, touch, taste and smell.

Communications Skills A lot of students with multiple disabilities have multiple impairments and have limited or no speech.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block

1. What are any two causes of multiple disabilities?

2. What are some common characteristics of individuals with multiple disabilities.

**UNIT 12 ASSOCIATED CONDITIONS OF MULTIPLE
DISABILITIES**

Various combinations of multiple disabilities and associated conditions such as epilepsy, motor and sensory conditions

After completion of this Unit, you will be able to

- Classify the epilepsy
- Describe the motor and sensory conditions

12.1 Definition, classification and symptoms of Epilepsy

Definition of Epilepsy by The International League Against Epilepsy:

A person is considered to have Epilepsy if they meet any of the following conditions:

1. At least two unprovoked (or reflex) seizures occurring greater than 24 hours apart.
2. One unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years.
3. Diagnosis of an epilepsy syndrome
 - a. Epilepsy is considered to be resolved for individuals who had an age-dependent epilepsy syndrome but are now

past the applicable age or those who have remained seizure-free for the last 10 years, with no seizure medicines for the last 5 years.

Seizures are generally described in two major groups:

Generalized seizures and focal seizures.

This difference is based on how and where they begin in the brain.

The following table shows the types of epilepsy:

Classification of Seizure Types		
Source: International League Against Epilepsy, 2017		
Focal Onset	Generalized Onset	Unknown Onset
MOTOR	MOTOR	MOTOR
NON MOTOR	Tonic-Clonic	Tonic-Clonic
Focal to bilateral	Other motor	Other motor
tonic-clonic	NON-MOTOR	NON-MOTOR
	Absence	Absence

There are now 3 major groups of seizures.

1. **Generalized onset seizures:** These seizures affect both sides of the brain or groups of cells on both sides of the brain at the same time. This term was used before and still includes seizure types like tonic-clonic, absence, or atonic to name a few.
2. **Focal onset seizures:** The term focal is used instead of partial to be more accurate when talking about where seizures begin. Focal seizures can start in one area or group of cells in one side of the brain.
 - **Focal Onset Aware Seizures:** When a person is awake and aware during a seizure, it's called a focal aware seizure. This used to be called a simple partial seizure.

- Focal Onset Impaired Awareness: When a person is confused or their awareness is affected in some way during a focal seizure, it's called a focal impaired awareness seizure. This used to be called a complex partial seizure.
3. **Unknown onset seizures:** When the beginning of a seizure is not known, it's now called an unknown onset seizure. A seizure could also be called an unknown onset if it's not witnessed or seen by anyone, for example when seizures happen at night or in a person who lives alone.
- As more information is learned, an unknown onset seizure may later be diagnosed as a focal or generalized seizure.

The different symptoms during a seizure are described based on movement into the following:

Generalized onset seizures:

- Motor symptoms may include sustained rhythmic jerking movements (clonic), muscles becoming weak or limp (atonic), muscles becoming tense or rigid (tonic), brief muscle twitching (myoclonus), or epileptic spasms (body flexes and extends repeatedly).
- Non-motor symptoms are usually called absence seizures. These can be typical or atypical absence seizures (staring spells). Absence seizures can also have brief twitches (myoclonus) that can affect a specific part of the body or just the eyelids.

Focal onset seizures:

- Motor symptoms may also include jerking (clonic), muscles becoming limp or weak (atonic), tense or rigid muscles (tonic), brief muscle twitching (myoclonus) or epileptic spasms. There may also be automatisms or repeated automatic movements, like clapping or rubbing of hands, lip smacking or chewing, or running.
- Non-motor symptoms: Examples of symptoms that don't affect movement could be changes in sensation, emotions, thinking or cognition, autonomic functions (such as gastrointestinal

sensations, waves of heat or cold, goosebumps, heart racing, etc.), or lack of movement (called behavior arrest).

Unknown onset seizures:

- Motor seizures are described as either tonic-clonic or epileptic spasms.
- Non-motor seizures usually include a behavior arrest. This means that movement stops and the person may just stare and not make any other movements.

12.2 Definition, classification and characteristics of sensory conditions:

Sensory impairment may include a student who is blind or visually impaired, deaf or hearing impaired, or is deaf-blind (Rosenberg, Westling, & McLeskey, 2011). Sensory integration disorders are central nervous system disorders characterized by imbalance among the primary sensations of sight, hearing, touch, taste, smell, vestibular or proprioception. Sensory Integration or Sensory Processing Disorders (SPD) can be classified as follows (Miller et al, 2007)

Characteristic include:

- Total or partial loss of vision
- Total or partial loss of hearing
- Loss of significant degree of both hearing and vision
- To qualify for special education, hearing and or vision loss must interfere with normal learning ability (Rosenberg, Westling, & McLeskey, 2011 p. 346)

Sensory impairment does not affect the cognitive skills of a student. However, some students with sensory impairments also have cognitive impairments. A sensory impairment will affect how the student accesses information and ultimately learns (Rosenberg, Westling, & McLeskey, 2011).

Classification of sensory disorders:

Sensory Processing Disorder		
Sensory Modulation Disorder	Sensory Based Disorder	Sensory-Discrimination Disorder
Sensory overresponsivity	Dyspraxia	Visual
Sensory underresponsivity	Postural Disorders	Auditory
Sensory seeking/craving		Tactile
		Vestibular
		Proprioception
		Taste/Smell

Source: Training Module on Multiple Disabilities, Pg. 54

SMD Subtype 1: Sensory Overresponsivity (SOR)

People with SOR respond to sensation faster, with more intensity, or for a longer duration than those with typical sensory responsivity. Overresponsivity may occur in only one sensory system (e.g., tactile defensiveness) or in multiple sensory systems (e.g., sensory defensiveness).

SMD Subtype 2: Sensory Underresponsivity (SUR) Children with SUR fail to attend to or register relevant stimuli. They will be oblivious to touch, pain, movement, taste, smell, sight or sound.

SMD Subtype 3: Sensory Seeking/Craving (SS) People with SS crave an unusual amount or type of sensory input and seem to have an

insatiable desire for sensation. They energetically engage in actions that add more intense sensations to their bodies in many modalities (e.g., spicy food, loud noises and, visually stimulating objects)

Pattern 2: Sensory Discrimination Disorder (SDD) SDD can be observed in any sensory modality. Most common types of SDD are tactile discrimination problems, proprioception problems, visual discrimination and auditory discrimination problems.

Pattern 3: Sensory-Based Motor Disorder (SBMD) People with SBMD have poor postural or volitional movement as a result of sensory problems. The two subtypes of SBMD are detailed below:

SBMD Subtype 1: Postural Disorder Postural disorder (PD) is difficulty stabilizing the body during movement or at rest to meet the demands of the environment or of a given motor task. PD is characterized by inappropriate muscle tension, hypotonic or hypertonic muscle tone, inadequate control of movement, or inadequate muscle contraction to achieve movement against resistance.

SBMD Subtype 2: Dyspraxia Praxis is the ability to conceptualise, plan and execute a non-habitual motor act. Dyspraxia is the problem with praxis. They have difficulty learning new tasks, will be disorganised in their approach to tasks and have poor work habits. These children have low self-esteem, are easily frustrated, prefer talking to doing and are late as well as forgetful.

12.3 Definition, classification and characteristics of motor conditions:

The various types of motor disabilities are:

Ataxia Persons who are diagnosed with ataxia experience a failure of muscle control in their arms and legs which may result in a lack of balance, coordination and possibly a disturbance in gait. Ataxia may affect the fingers, hands, arms, legs, body, speech and even eye movements.

Dystonia Dystonia is a neurological condition with a very broad range of manifestations. The basic underlying problem involves over-activity of the main muscles needed for a movement, extra activation of other muscles that are not needed for the movement, and simultaneous activation of muscles that work against each other.

Essential Tremor Essential tremor (ET) is the most common movement disorder. It is a progressive, often inherited disorder that usually begins in later adulthood. Patients with ET typically experience tremors when the arms are held up and when the hands are being used for activities like eating, drinking or writing.

Parkinson's Disease Parkinson's disease (PD or simply, Parkinson's) is the most common form of parkinsonism, a group of motor system disorders. It is a slowly progressing, degenerative disease which results from the loss of dopamine-producing brain cells.

Atypical Parkinsonisms These disorders can produce signs and symptoms similar to those of Parkinson's disease, but do not respond to typical Parkinson's disease medications such as levodopa.

Source: The Parkinson's Disease and Movement Order Center

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block

3.What are the four types of focal onset seizure:

.....
.....

4.What is dystonia?

.....
.....

UNIT 13 OTHER DISABLING CONDITIONS

Other disabling conditions such as leprosy cured students, tuberous sclerosis and multiple sclerosis should also know in order to provide rehabilitation

After completion of this Unit, you will be able to

- Explain the classification, characteristics of leprosy cured

- Describe the classification, characteristics of TB and multiple sclerosis

13.1 Definition, classification and characteristics of Leprosy:

Leprosy: An infectious disease of the skin, nervous system, and mucous membranes that is caused by the bacteria *Mycobacterium leprae*. Leprosy is transmitted via person-to-person contact. Antibiotic therapy is the mainstay of treatment. Surgery can be performed to reconstruct damaged faces and limbs. Leprosy is also known as Hansen's disease.

(Source: Medicinenet).

Classification of Leprosy:

There are three systems for classifying leprosy.

System 1 recognizes two types of leprosy: tuberculoid and lepromatous. A person's immune response to the disease determines their type of leprosy.

Tuberculoid: The immune response is good and the disease only exhibits a few lesions (sores on the skin). The disease is mild and only mildly contagious.

Lepromatous: The immune response is poor in lepromatous leprosy and affects the skin, nerves and other organs. There are widespread lesions and nodules (large lumps and bumps). This disease is more contagious.

System II WHO categorizes the disease based on the type and number of affected skin areas.

The first category is paucibacillary, in which five or fewer lesions with no bacteria are detected in the skin sample.

The second category is multibacillary, in which there are more than five lesions, bacteria is detected in the skin smear or both.

System III Clinical studies use the Ridley-Jopling system. It has six classifications based on severity of symptoms. They are:

- Intermediate leprosy: A few flat lesions that sometimes heal by themselves and can progress to a more severe type
- Tuberculoid leprosy: A few flat lesions, some large and numb, some nerve involvement, can heal on its own, persist, or may progress to a more severe form.

- Borderline tuberculoid leprosy: Lesions similar to tuberculoid but smaller and more numerous. It has less nerve enlargement, may persist, revert to tuberculoid, or advance to another form.
- Mid-borderline leprosy: Reddish plaques, moderate numbness, swollen lymph glands May regress, persist, or progress to other forms.
- Borderline lepromatous leprosy: Many lesions including flat lesions, raised bumps, plaques and nodules, Sometimes numb, may persist, regress, or progress
- Lepromatous leprosy: Many lesions with bacteria and hair loss. Nerve involvement, limb weakness, disfigurement and doesn't regress

(Source: Healthline)

Symptoms of Leprosy:

The symptoms of leprosy are muscle weakness, numbness in the hands, arms, feet and legs and skin lesions. The lesions in the skin have minimal sensation to touch, pain or temperature. They do not heal after several weeks and are lighter than the normal skin tone.

13.2 Definition, classification and characteristics of Tuberos Sclerosis

Definition:

Tuberous sclerosis also called tuberous sclerosis complex, which as is an uncommon genetic disorder that causes non cancerous (benign) tumors which are unexpected overgrowths of normal tissue to develop in many parts of the body. Signs and symptoms vary widely, depending on where the growths develop and how severely a person is affected.

(Source: MayoClinic)

Classification of Tuberous Sclerosis:

Tuberous Sclerosis can affect different parts of the body causing a variety of signs and symptoms. Symptoms can be mild to quite severe based on which organs are involved. Tumors most commonly grow in brain, kidney, heart, lungs and skin.

Characteristics of Tuberous Sclerosis:

Tuberous Sclerosis is caused by non cancerous growths in parts of the body. Here are the common signs and symptoms of the disease:

- Skin abnormalities. Most people with tuberous sclerosis have patches of light-colored skin, or they may develop small, harmless areas of thickened, smooth skin or reddish bumps under or around the nails.
- Seizures. Growths in the brain may be associated with seizures, which can be the first symptom of tuberous sclerosis.
- Cognitive disabilities. Tuberous sclerosis can be associated with developmental delays and sometimes intellectual disability or learning disabilities.
- Behavioral problems. Common behavioral problems may include hyperactivity, self-injury or aggression, or issues with social and emotional adjustment.
- Kidney problems. Most people with tuberous sclerosis develop noncancerous growths on their kidneys and they may develop more growths as they age.
- Heart issues. Growths in the heart, if present, are usually largest at birth and shrink as the child gets older.
- Lung problems. Growths that develop in the lungs may cause coughing or shortness of breath, especially with physical activity or exercise.
- Eye abnormalities. Growths can appear as white patches on the light-sensitive tissue at the back of the eye (retina). These noncancerous growths don't always interfere with vision.

(Source: mayoclinic)

13.3 Definition, classification and characteristics of Multiple Sclerosis:

Definition:

The National Multiple Sclerosis Society defines Multiple Sclerosis as a condition which involves an immune-mediated process in which an abnormal response of the body's immune system is directed against the

central nervous system (CNS). The CNS is made up of the brain, spinal cord and optic nerves.

Classification of Multiple Sclerosis (MS):

The International Committee of Clinical Trials classified MS in 2013 thus:

1. Clinically Isolated Syndrome (CIS): The first episode of neurological symptoms caused by inflammation or demyelination in the Central Nervous System. This does not meet the criteria for MS since an individual may or may not develop Multiple Sclerosis after a first attack of CIS.
2. Relapsing-Remitting MS (RRMS) - The most common disease course is characterized by clearly defined attacks of new or increasing neurological symptoms.
3. Secondary Progressive MS (SPMS) Most individuals diagnosed with RRMS will eventually have a transition to a secondary progressive course in which there is a progressive worsening of neurological functions.
4. Primary Progressive MS (PPMS): This condition is characterised by worsening neurological functions from the onset of symptoms without relapse or remission.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block

5. What is the common name of Hansen’s disease.

.....
.....

6. What is the other name of tuberous sclerosis complex

.....
.....

UNIT 14 IMPLICATIONS OF FUNCTIONAL LIMITATIONS OF CHILDREN FOR EDUCATION AND CREATING PROSTHETIC ENVIRONMENT IN SCHOOL AND HOME

Implications of Functional Limitations of Children for Education and Creating Prosthetic Environment in School and Home: Seating Arrangements, Positioning and Handling Techniques at Home and School

After completion of this Unit, you will be able to

- Describe the implications of functional limitations for education
- Explain creating prosthetic environment in school and home

14.1 Implications of Functional Limitations for Education

Children with multiple disabilities and associated conditions or other disabling conditions have a variety of needs based on their disability. These individuals exhibit a wide range of characteristics based on the combination and severity of disability. The following are some common traits these individuals may share:

- Limited speech or communication
- Difficulty in basic physical mobility
- Sensory losses
- Behavior problems
- Presence of primitive reflexes
- Possibly non-ambulatory
- Tendency to forget skills through disuse
- Trouble generalizing skills from one situation to another
- A need for support in major life activities (e.g., domestic, leisure, community use, vocational)

14.2 Positioning

- It is essential that the children are handled using effective techniques to maximise comfort and functional efficiency.

- The children should be seated and positioned in such a way that it allows maximum participation and comfort.
- Positioning refers to the use of appropriate body positions.
- Children with multiple disabilities spend a lot of time in abnormal positions due to the abnormal pull of muscles. The abnormal muscles can lead to tightness and other contractures and deformities as well as avoided whenever possible.
- Proper positioning should be used in all routines throughout the child's day.

14.3 Handling:

- Handling refers to a specific set of techniques that enables a student to move as independently as possible from one position to the next.
- It relates to transition movements.
- These techniques are individualized per child's needs.

14.4 Creating Prosthetic Environment in School and Home:

Wedge position:

A child with no head or trunk control can be positioned in a wedge in prone position. Head and neck should be off the wedge. A child can bear his weight on extended elbows while in this position. A roll can be placed between the legs and under the chest for stability. The wedge position enables the child to gain some trunk control and some head control.

Side lying:

Place a small roll under the head such that the neck is slightly laterally flexed. Long roll in front extending from chest to legs. One leg to be kept on the top of the roll. Position the child on both sides.

Seating:

Corner sitting: Lap boards to be provided, so that the child can engage in activities

Corner stools: Can be used when the child has some amount of head control. It provides trunk support to the child. Make sure that, the hips, knees and ankle are at 90. The feet should always rest on the floor. If not, provide a small foot rest. The hips should always be kept apart.

This can be done by keeping a roll between the legs. If the child bends his trunk to one side while sitting, it will lead to deformities. Trunk blocks can be added to prevent this. If the child is not mobile, wheels can be attached to the chair, so that it will be easier for the parents to move the child around the house.

Standing

A child can be assisted to stand with the help of a Standing frame. Helps in the reduction of tone throughout the body. The frame enables the child to see what is happening in the classroom as well and engage in activities.

Carrying Techniques

While carrying the child or shifting the child from one position to another the following techniques can be used. Carry across the teacher's hips with the child's hips and knees bent and knees separate and not over the shoulders.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block.

7. When is a child placed in wedge position.

.....
.....

8. What is the use of a trunk block?

.....
.....

UNIT 15 FACILITATING TEACHING-LEARNING

To facilitating teaching learning, the individualised education plans are to be implemented.

After completion of this Unit, you will be able to

- Facilitate the teaching learning through IEP programmes

15.1 IEP

An IEP is an individualized educational Program that is specifically created for each child. An IEP has assessment information, health records, present levels of functioning information and annual goals of the student along with progress reports that are made every quarter. An IEP has a detailed listing of the modifications and accommodations needed for the student to succeed in the classroom. It is important that the IEP is developed in a team meeting with the input of the parents and all service providers. This ensures that the team members get a holistic picture of the child thereby making informed and collaborative decisions on program planning. An IEP is the starting place of a child's services in school. A well written IEP will serve as a very useful guidebook in planning for the child's educational activities. Also, the IEPs from past years serve as a great record to see the child's progress over time and level of functioning in different domains.

The most important parts of an IEP are:

Information Sheet

Assessment Details

Present Levels

Annual Goals with benchmarks and Progress Reports

Assessments and Modifications needed for a student.

Transition Plan in case of students in Vocational Level.

Vision and Hearing Assessment

Psychological Assessment/ Speech assessment/ assessments by service providers

Relevant progress reports, intake form and discharge paperwork from other schools.

Present levels are the foundational part of an IEP. The present levels of performance give an accurate description of a student's current functioning in a particular area.

Example:

Kannan's Present Level in Math:

Kannan is able to count upto 100. He is able to draw pictures to represent numbers upto 30.

Devi enjoys reading time when an adult reads a book to her. She is able to read a first standard passage independently. Devi is able to answer a few who, what or why questions when an adult shows a picture or uses prompts.

Benchmarks:

Benchmarks indicate the short term steps a child will take to complete a goal. Benchmarks help us measure the progress a child is making towards a goal.

Examples of a complete IEP goal format:

<p>Date:26/10/2016</p> <p>Present Level: Kannan is able to count upto 100. He is able to draw pictures to represent numbers upto 30.</p> <p>Goal: By 26/10/2017, when given five addition problems, Kannan will be able to draw pictures and represent addition with 80% accuracy.</p>		
Benchmark 1	Benchmark 2	Benchmark 3
By 26/2/2017, when given an addition problem with pictures, Kannan will count the pictures and represent addition with 80% accuracy.	By 26/6/2017, when given an addition problem (below 10) without pictures, Kannan will add with 80% accuracy.	By 26/10/2017, when given five addition problems, Kannan will be able to draw pictures and represent addition with 80% accuracy.

Progress: 26/2/2017 Benchmark met	Progress:	Progress:
Goal met? If yes, add new goal.	-	-

IEP GOALS IN DETAIL

SMART expansion	Meaning	Example of a non smart goal	Example of a smart goal.
Specific	The goal is specific in naming the skill or subject area and the targeted result. Details matter!	Kannan will improve in Maths.	By (date) when given five addition problems, Kannan will be able to draw pictures and represent addition with 80% accuracy.
Measurable	The goal is stated in a way that your child's progress can be measured using teacher made assessments, anecdotal data or standardized measurements.	Devi will read English.	By (date), when given a second standard level reading passage, Devi will read the passage and answer who, what and why questions with 75% accuracy four out of five times.
Attainable	The goal represents progress that is realistic for your child.	Shyam will listen to directions whenever he is in the classroom.	By (date), when given a verbal prompt, Shyam will follow directions by the first prompt four out of five times as measured

			by a behaviour log.
Result Oriented	The goal clearly explains what the child should do accomplish the goal.	Biju will communicate better with friends.	By (date), when complimented, Biju will acknowledge the comment by saying “thank you” and smiling in four out of five opportunities as measured by data collected from staff logs and teacher records.
Time bound	The goal includes a time frame in which your child will achieve it, with the right supports and services. It also states when and how often progress will be measured.	Arthi will independently complete work.	By (date), Arthi will complete a work assignment without help in four out of five opportunities as measured by behaviour logs and teacher records.

(Adapted from <https://www.understood.org/en/school-learning/special-services/ieps/how-to-tell-if-your-childs-iep-goals-are-smart>)

An IEP template is provided as an annexure for student use. (Annexure A)

15.2 Developing Teaching Learning Materials

Teaching Learning materials refers to any material used to assist in teaching a lesson. Teaching Learning materials greatly support student learning and ensure student success. The teaching learning materials can be tailored to the content to be taught and can be modified for each lesson based on what is needed to be taught. Teaching Learning Materials refer to concrete examples that can be used for practise and to apply the concepts learned from the lesson. For example, a teacher can show the world map to a student and explain the location of different countries. Now the student can demonstrate understanding by using a blank paper map and labelling a few countries. Teaching learning materials enable children to apply knowledge and to demonstrate understanding of the lessons learned.

15.3 Assistive Technology

Assistive technology is an umbrella term that includes assistive, adaptive, and rehabilitative devices for people with disabilities while also including the process used in selecting, locating and using them. Many types of assistive technology devices are used to teach children with multiple disabilities in the classroom. Some examples are: Communication boards, computers, head sticks and adaptive switches allow disabled children to communicate effectively with others. Teenage Switch Progressions allow students to press a switch to activate activity-based instruction on the computer. Other types of AT are wheelchairs, walkers, speech synthesizers, alternative keyboards, pointing systems, talking clocks and calculators, voice recognition software, picture boards, Braille machines, reading machines, magnification software, phonic ear devices, telecommunication devices and sound magnification systems.

Check your progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with those given at the end of the Block

9.What is assistive technology.

.....
.....

10.What is an IEP.

.....
.....

LET US SUM UP

Every human being has a right to a happy and safe life. It is possible to provide a positive, safe and enriching environment for individuals with multiple disabilities by gaining a clear understanding of an individual's strengths and needs. This will in turn make it possible for parents and service providers to provide the most appropriate supports through assistive devices or mobility aids or use positioning and handling techniques to support individuals to function at their optimal best. Our world has seen legends like Stephen Hawking who rose beyond every physical challenge and became a world renowned physicist, cosmologist and author. This was possible because of the excellent support he received from his care providers and family.

GLOSSARIES

- Multiple disabilities - multiple disabilities A term of art referring to a combination of impairments in a child
- Adaptive skills - Adaptive skills come from adaptive behavior, or the conceptual, social, and practical skills that individuals have learned and use in their daily lives.
- Leprosy - a contagious disease that affects the skin, mucous membranes, and nerves, causing discoloration and lumps on the skin and, in severe cases, disfigurement and deformities
- Multiple sclerosis - a chronic, typically progressive disease involving damage to the sheaths of nerve cells in the brain and

spinal cord, whose symptoms may include numbness, impairment of speech and of muscular coordination, blurred vision, and severe fatigue.

- Seizures - the action of capturing someone or something using force
- Benchmark - a standard or point of reference against which things may be compared
- Attainable - able to be attained; achievable

ANSWERS TO CHECK YOUR PROGRESS

1. Lack of oxygen at birth.

Chromosomal abnormalities.

Premature birth.

Difficulties after birth.

Poor development of the brain or spinal cord.

Infections

Genetic Disorders.

Injuries from accidents.

2. Common Characteristics of Individuals with Multiple Disabilities:

Students with multiple disabilities have unique characteristics with respect to the following domains:

Intellectual Functioning: Most students with multiple disabilities tend to have many challenges with their intellectual functioning. Due to the unique combinations of challenges, students tend to have very different academic strengths and challenges.

Adaptive Skills: These skills include conceptual, social and practical competencies for functioning in a typical community setting that matches with an individual's age.

Motor Development: Students have difficulty sitting or moving and show muscle tone abnormality.

Sensory Functioning: Individuals with multiple disabilities have difficulties with one or more of their sense faculties of sight, sound, touch, taste and smell.

Communications Skills A lot of students with multiple disabilities have multiple impairments and have limited or no speech.

3. Four types of focal onset seizure are:
 - Motor
 - Non Motor
 - Focal to bilateral
 - Tonic-clonic.
4. Dystonia is a neurological condition with a very broad range of manifestations. The basic underlying problem involves over-activity of the main muscles needed for a movement, extra activation of other muscles that are not needed for the movement, and simultaneous activation of muscles that work against each other.
5. Leprosy.
6. Tuberous sclerosis.
7. A child is placed in a wedge position when there is no head or trunk control.
8. A trunk block is used to prevent the trunk from bending to one side.
9. Assistive technology is an umbrella term that includes assistive, adaptive, and rehabilitative devices for people with disabilities while also including the process used in selecting, locating, and using them.
10. An IEP is an Individualized Education Program that is specifically created for each child.

SUGGESTED READINGS

- Miller, F. and Bachrach, S.J. (2012). *Cerebral Palsy: A Complete Guide for Caregiving*. A Johns Hopkins Press Health Book.
- Sarva Siksha Abhiyan. Module on Cerebral Palsy. <http://ssa.nic.in/inclusiveeducation/>

training-module-for-resource-teachers-for-disablechildren/

Module%205%20Cerebral%20Palsy.pdf/at_download/file

- Sarva Siksha Abhiyan . Module on Multiple Disabilities.
<http://ssa.nic.in/inclusiveeducation/>

training-module-for-resource-teachers-for-disablechildren/

Module%203%20Multiple%20Disability.pdf/at_download/file

Annexure A

IEP TEMPLATE

IEP TEAM MEMBERS

NAME	DESIGNATION	SIGNATURE
	STUDENT	
	PARENT	
	PARENT	
	CLASSROOM TEACHER	
	TEACHER AIDE	
	SCHOOL ADMINISTRATOR	

IEP CHECKLIST:

TOPIC	CHECK IF COMPLETED
INTRODUCTIONS	
OUTLINING PURPOSE OF MEETING	
PARENT REPORT	
TEACHER- REVIEWS PRESENT LEVELS	
TAKES FEEDBACK ON PRESENT LEVELS FROM PARENT	
TEACHER RECORDS PARENT EXPECTATIONS	
ASSESSMENT INFORMATION IS REVIEWED	
GOALS ARE REVIEWED	
PROGRESS ON GOALS IS DISCUSSED	
STUDENT MEETING TO COMMEND ON PROGRESS	
ADMIN RECOMMENDATIONS	
PARENT CONCERNS	
PARENT SIGNATURE	
COPY OF IEP TO PARENT	

PRESENT LEVEL OF PERFORMANCE

AREA	PRESENT LEVEL
SELF HELP SKILLS	
MOTOR SKILLS	
SPEECH	
LANGUAGE	
SOCIO EMOTIONAL	
BEHAVIOR	
ACADEMICS	
READING	
WRITING	
MATH	
VOCATIONAL	
OTHER AREAS	

GOALS

Goal Area:

Date: Present Level: Goal:		
Benchmark 1	Benchmark 2	Benchmark 3
Progress:	Progress:	Progress:
Goal met? If yes, add new goal.		

Goal Template:

Date: Present Level: Goal:		
Benchmark 1	Benchmark 2	Benchmark 3
Progress:	Progress:	Progress:
Goal met? If yes, add new goal.		

Goal Template:

Date: Present Level: Goal:		
Benchmark 1	Benchmark 2	Benchmark 3
Progress:	Progress:	Progress:
Goal met? If yes, add new goal.		

Goal Template:

Date: Present Level: Goal:		
Benchmark 1	Benchmark 2	Benchmark 3
Progress:	Progress:	Progress:
Goal met? If yes, add new goal.		

MEETING NOTES:

PARENT SIGNATURE:

Useful Web Links:

- “Children with severe Cerebral Palsy - an educational guide.” Blix et al.
- <http://cpdailyliving.com/types-of-therapy/>
- <http://cpfamilynetwork.org/cerebral-palsy-developmental-milestones-birth-to-12-months/>
- <http://cpfamilynetwork.org/cerebral-palsy-diagnosis/>
- <http://indianexpress.com/article/lifestyle/health/new-system-to-monitor-cerebral-palsy-levels/>
- <http://journals.sagepub.com/doi/pdf/10.1177/0883073815596610>
- <http://medind.nic.in/icb/t05/i11/icbt05i11p979.pdf>
- http://onlinelibrary.wiley.com/doi/10.1111/dmcn.61_13512/full
- <http://www.cerebralpalsy.org/about-cerebral-palsy/diagnosis/checklist>
- http://www.icddelhi.org/cerebral_palsy_spastic_hemiplegia.htm
- <http://www.iicpindia.org/>
- <https://cerebralpalsygroup.com/cerebral-palsy/spastic/>
- <https://cerebralpalsyresource.weebly.com/teaching-strategies.html>
- <https://link.springer.com/article/10.1007%2Fs12098-014-1344-4>
- https://people.uwec.edu/rasarla/research/mtorg/adaptive_music/cerebral_palsy.pdf
- <https://research.cerebralpalsy.org.au/about-cerebral-palsy/assessments-and-outcome-measures/>
- <https://research.cerebralpalsy.org.au/what-is-cerebral-palsy/types-of-cerebral-palsy/ataxic-cerebral-palsy-ataxia/>
- https://www.cerebralpalsy.org.au/wp-content/uploads/2013/04/early_school_years_fact_pack.pdf
- https://www.cerebralpalsy.org.au/wp-content/uploads/2013/04/early_school_years_fact_pack.pdf
- <https://www.cerebralpalsyguide.com/cerebral-palsy/>
- <https://www.ncbi.nlm.nih.gov/pubmed/16391455>
- <https://www.speechbuddy.com/blog/speech-disorders/communication-difficulties-for-children-with-cerebral-palsy/>

- MayoClinic. (2016, aug. 25). Cerebral Palsy (Web page). Retrieved from
<https://www.mayoclinic.org/diseases-conditions/cerebral-palsy/symptoms-causes/syc-20353999>
- Training Module on Cerebral Palsy and Locomotor Movement - Sarva Shiksha Abhiyan.
 - <https://www.epilepsy.com/learn/types-seizures>
 - <https://www.understood.org/en/school-learning/special-services/ieps/how-to-tell-if-your-childs-iep-goals-are-smart>
 - http://aasep.org/fileadmin/user_upload/Protected_Directory/BCS_E_Course_Files/Course_5/Chapter-9-Special_Education_Eligibility.pdf
 - http://servicesguide.reading.gov.uk/kb5/reading/directory/advice.page?id=yjdblhTe_x0
 - <https://academic.oup.com/cid/article/44/8/1096/298106>
 - <https://aerbvi.org/wp-content/uploads/2016/01/MDDB-Sharons-Story-2015.pdf>
 - <https://sites.google.com/site/indianatechspecialeducation/videos/multiple-disabilities/definition>
 - <https://sites.google.com/site/indianatechspecialeducation/videos/mult>
 - <https://specialneedshandbook.wikispaces.com/Multiple+Disabilities>
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URKUND Plagiarism Report



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About Tamil Nadu Open University



Tamil Nadu Open University was established in 2002 by an Act of Tamil Nadu Legislature, with the objective of introducing and promoting Open University and Distance Education systems in Tamil Nadu. Relaxed entry procedures, maintenance of standards, individualized study, flexibility in terms of place, duration of study, use of latest ICT, well-knit student support services network, cost effective programmes, collaboration and resource sharing with other Universities are its salient features. Presently functioning at its headquarters at Saidapet, Chennai.

School of Special Education and Rehabilitation

The School of Special Education and Rehabilitation (SOSER) was established with the approval of the Academic Council and the Syndicate of the University in 2009. This School comes under the Faculty of Education. The prime function of the School is to undertake academic, training, research, and extension activities for promoting education and rehabilitation of persons with disabilities. The Tamil Nadu Open University and the Rehabilitation Council of India has signed a MoU during 2006 to launch the B.Ed.Spl.Education Programme with the specialisations of Hearing Impairment (HI), Visual Impairment (VI) and Mental Retardation/Intellectual Disabilities (MR/ID) through Distance Mode. The School has produced around 4500 special educators since its inception.

The Tamil Nadu Open University, the first University in the State of Tamil Nadu, to offer B.Ed. Special Education through Open Distance Learning Mode since 2008 and the first State Open University offered M.Ed. in Special Education through Distance Mode during 2015 – 2016. The Special Education programme offered by SOSER are approved by the Government of Tamil Nadu, the Rehabilitation Council of India (RCI), New Delhi and the University Grants Commission (UGC), New Delhi.

The Department of Higher Education, Government of Tamil Nadu issued the G.O. MS No. 56, Dated: 24.04.2012 to consider the B.Ed. Special Education as equivalent to B.Ed. General Education for the purpose of employment in public services. This would create an impact to get more number of persons to work for persons with disabilities in inclusive schools.

A Centre for Multimodal Material Production for Differently Abled (CMPD) is also functioning under the School of Special Education and Rehabilitation in order to cater to the educational needs of students disabilities enrolled in various programmes of the University.

The SOSER has been conducting RCI approved CRE programmes and In-service Trainings for Govt. Officials on disability and Special Education and when demand arises.

The University aims to expand the spectrum of special education programmes such as M.Ed.Spl.Ed., Ph.D., in Special Education in the coming years.



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