

# Training Module on Cerebral Palsy and Locomotor Impairment



शिक्षा का अधिकार

सर्व शिक्षा अभियान  
स्व पढ़ें सब बढ़ें

## Sarva Shiksha Abhiyan

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## Section 1

# Introduction

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Note: Children are children and children with cerebral palsy are children first. Thus instead of student or pupil we have to use the term 'child' or 'children'. Since CP includes males and females we have used he/she interchangeably.

### Introduction to Cerebral Palsy (CP)

Cerebral palsy is a disorder causing problems with movement and balance. It is caused by brain damage or mal-development of the developing brain resulting in physical disability in varying degrees. The physical disabilities may co-exist with other associated problems of hearing, vision, language and communication, intellectual disabilities, autism and specific learning disabilities such as dyslexia. Some children with cerebral palsy also suffer from epilepsy. CP is not hereditary, it is not a disease or infectious. It is non-progressive; there is no cure but with early diagnosis and suitable intervention, there is scope for improvement regardless of the severity of the condition.

All children with cerebral palsy have physical disability but the degree of disability differs from person to person. Some may be able to move and walk independently while others may be dependent on others even for basic activities of daily living and need the help of mobility aids such as a wheelchair or crutches. Some may be able to do tasks that require fine motor coordination such as buttoning and handwriting, others may not be able to use their hands for any functional activities. Many have average or above average intelligence and given the necessary supports, their academic performance could be like any other student in the class. Others may have learning difficulties in varying degrees. Many persons with CP have speech difficulties; for some this may result in slurred and indistinct speech while others may not be able to use speech for communication and will need an augmented and alternative mode of communication. Thus CP is only an 'umbrella' term as there is no 'typical' case of the CP - individuals with CP differ greatly from one another. The heterogeneity of the population becomes a challenge for teachers and other service providers. Detailed assessment is critical not only of physical abilities but also of other developmental areas – speech, communication and language, sensory functions, cognitive development, social and emotional development, activities of daily living and self care.

The individualised assessment and the fact that the programme to be designed keeping in mind individual strengths and needs is perhaps one of the major reasons why teachers in mainstream

school find it extremely difficult to accommodate students with cerebral palsy in an inclusive school. Children with cerebral palsy will not be able to access schools unless there are architectural modifications and design features that provide a lift and ramps, accessible surfaces, modified toilets with wider doors and enough space to manoeuvre the wheelchair. They will not be able to cope with the syllabus unless there is scope for modifications in the curriculum such as alternatives to handwriting, extra time for tasks, provision of augmentative and alternative communication devices, inclusive sports and other co-curricular activities. Most important are attitudinal factors – sensitivity, respect for diversity and difference and open-ness to change.

Also it is a fact that till such time as **all** mainstream schools are equipped with (a) trained teachers (b) have access to physiotherapists, occupational therapists and speech therapists (c) special aids and appliances (d) universal design and (e) a multi-layered and modified curriculum. Children with cerebral palsy with severe to profound disabilities will need special schools.

Comprehensive professional services for children and adults with cerebral palsy are also provided by National Institute for Empowering Persons with Multiple Disabilities (NIEPMD), Chennai and the National Institute of Orthopaedically Handicapped, Kolkata are statutory bodies working under the aegis of the Ministry of Social Justice and Empowerment.

In the NGO sector, there are five national level organizations that have significantly contributed to the growth and development of services for CP and conduct a range of training programmes for human resource development in the disability sector - ADAPT (formerly Spastics Society of India in Mumbai, AADI formerly Spastics Society of Northern India, Delhi, Spastics Society of Tamil Nadu (SPASTN), Vidyasagar formerly Spastics Society of India, Chennai and Indian Institute of Cerebral Palsy (IICP) Kolkata. There are also state level NGOS many of whom are registered with National Trust. This network believes in a rights based approach to disability and is committed to the removal of all types of barriers that prevent persons with cerebral palsy from gaining access to their constitutional rights. The organizations have the capacity to train teachers and other allied professional groups about educational issues related to cerebral palsy and should be approached for more effective inclusive education.

The Indian Institute of Cerebral Palsy (IICP) has played a pioneering role in initiating and augmenting services for people with cerebral palsy. Over the last three decades IICP has strived to meet the growing need for services for children and adults with cerebral palsy in the country. In order to do this it set up service centers of excellence at its headquarters in Kolkata. IICP has also set up a research and training Institute. Affiliated to Jadavpur University, IICP runs multi level training programmes ranging from post graduate training to need based training for parents and village community workers. IICP has received several awards for exemplary services.

Since 2004, IICP has been working as the State Nodal Agency Centre, West Bengal for National Trust and has facilitated NGOS and GOs in implementing policies and schemes of the National Trust. IICP has extensive experience of working for persons with disability in rural areas and urban slums in partnership with development agencies. IICP's community based work encompasses all aspects of community development, working with families to improve health care, employment and self-help schemes, education and human rights, especially for communities disadvantaged and members of the community with the added difficulty of having a disability.

## Introduction to Locomotor Disability

Locomotor disability includes many types of physical disability and there are usually no associated problems. Early diagnosis and appropriate medical intervention and the provision of aids and appliances are critically important to avoid further damage during handling; some conditions lead to sensory loss in the affected limbs such as:

- Spinal bifida
- Arthrogryposis (brittle bone disease)
- Disability due to spinal injury
- Tubercular spine

Comprehensive assessments are recommended before educational placement. Many children with locomotor disabilities are able to follow a regular curriculum provided suitable aids and appliances are available; counseling support is beneficial. However children with spina bifida often have learning difficulties and will need a detailed educational assessment; if required they must have access to a modified curriculum.

## Recommended Reading

IICP publication Ao Ek Saath Parhey

The module on cerebral palsy and locomotor disability is designed for teachers in mainstream schools. It has been designed in two sections:

**Section A:** Physical and functional (ADL) management

**Section B:** Educational (reading, writing, AAC)

## Objectives

Provide orientation training on children with Cerebral Palsy and Locomotor disabilities for teachers of children with special needs (CWSN) in SSA.

## Methodology

A master trainer from an organization dealing with CP and locomotor disabilities will need to be deputed to train trainers and teachers on using this module and using the complementary material published by IICP; these are cross –referenced throughout the module.

## Expected Outcomes

After training in this module the teacher will have a basic idea of:

- Definition, types and causes of cerebral palsy and locomotor disabilities
- Screening and identification of children with cerebral palsy and locomotor disabilities
- Reasonable accommodation for children with cerebral palsy and locomotor disabilities in the mainstream schools
- Assessment - physical, functional, educational
- Handling and positioning in the classroom
- Access, mobility aids and special furniture
- Teaching strategies for reading, writing and number work
- Augmentative and Alternative Communication.



## Contents of the Course

### Cerebral Palsy and Locomotor Disability

#### Understanding of Cerebral Palsy and Locomotor Disabilities

#### Section – A

S.No.	Topics & Contents	Theory	Practical	Remarks
1.	<p><b>Cerebral Palsy</b></p> <p>Definition</p> <p>Associated problems</p> <p>Types</p> <p>Features of each type</p> <p><b>Basic assessment</b></p> <p>Physical</p> <p>Mobility</p> <p>Hand functions</p> <p>Functional</p> <p>Eating and drinking</p> <p>Toileting</p>	3 hours	7 hours	<p>Handouts to be given to all trainees for reference.</p> <p>IICP booklets have been cross referenced</p>
2	<p><b>Locomotor Disabilities</b></p> <p>Definition</p> <p>Causes</p> <p>Types of Locomotor disabilities and their features</p> <p>Assessment and recommendations</p> <p><b>Access</b></p> <p>Barrier-Free Environment</p> <p>How it can be done</p>	4 hours	6 hours	<p>Handouts to be given to all trainees</p>
	<p><b>Access</b></p> <p>Barrier-Free Environment</p> <p>How it can be done</p>	2 hours	6 hours visit to resource centre for observation	<p>Handouts to be given to all trainees</p> <p>IICP booklets have been cross referenced</p>

S.No.	Topics & Contents	Theory	Practical	Remarks
	<b>Furniture and Mobility Aids</b>	2 hours		
	Introduction			
	Advantages			
	Disadvantages			
3.	<b>Section - B</b>			Handouts to be given to all trainees.
	<b>Educational intervention (30 hrs)</b>			
	Reading and Writing	3 hours	7 hours	Books and booklets
	Number skills	3 hours	7 hours	have been cross
	Language and Communication	3 hours	6 hours	referenced
	Co-Curricular Activities		1 hours	

## Section 2

# Understanding of Cerebral Palsy and Locomotor Disabilities

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## Cerebral Palsy

### What is Cerebral Palsy?

#### Definition

Cerebral palsy is a persistent but not unchanging disorder of movement and posture due to a defect or lesion of a developing brain. It occurs in about 2 in 1000 live births.

The main problems of children with cerebral palsy have is a physical problem but with the physical problem some children may also have associated problems such as:

- Mental retardation
- Hearing impairment
- Visual impairment
- Language and communication
- Specific learning problems
- Epilepsy

#### Possible Causes

- Illness or infection during pregnancy.
- Premature birth.
- Difficulties during the baby's birth.
- Infections such as encephalitis and meningitis affecting a child.
- Injury to the child's brain.

### Types of Cerebral Palsy

Cerebral Palsy can be divided into four different types according to the site of the brain lesion.

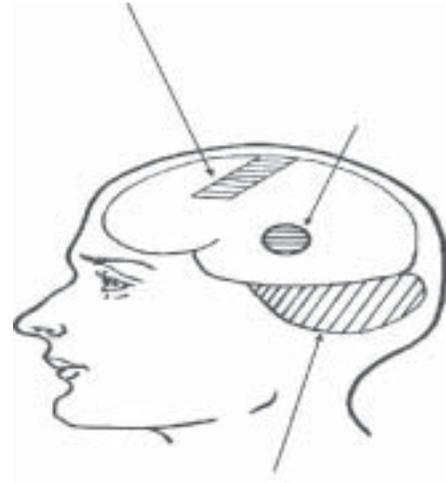
- Spastic (due to the lesion in the motor area in cerebral cortex)

- Athetoid (due to the lesion in the basal ganglia in midbrain).
- Ataxia (due to the lesion in the cerebellum).
- Mixed type, a combination of any of these.

This area is called the MOTOR CORTEX – if it is damaged, movements are stiff and often slow. This is known as SPASTICITY

This area, deep in the brain is called the BASAL GANGLIA - if it is damaged, movements are jerky and uncontrolled. This is known as ATHETOSIS

This area is called the CEREBELLUM – if it is damaged, movements are uncoordinated and may be shaky. This is known as ATAXIA



## Features of Cerebral Palsy

### Spastic Type & its Features

- The muscles of the affected parts of the body have generalised tightness and stiffness.
- If you try to move the affected limbs then there will be resistance against the movements.
- This tightness blocks movement and if it remains untreated then this may lead to permanent fixation of the joint movements (contracture).
- Usually it is associated with a pattern of backward stretching body and straightening leg muscles (extension) and bending the arms towards the body (flexion) in the arms.
- Tightness of the muscles increases with excitement, fear or anxiety.

### Athetoid Type & its Features

- The main characteristic in athetosis is involuntary or purposeless movements which are uncontrollable.
- These movements may be slow, fast jerky tremor, swiping or rotary patterns or un-patterned.
- These movements appear when the child tries to move and interferes with the normal movement.
- They are increased by excitement, insecurity and efforts to make movements.
- They decrease in certain postures, when the child is tired or sleepy and during sleep.

- Athetoid movements usually occur in the whole body. Sometimes spasticity may also be present.

### **Ataxia Type & its Features**

- The main movement problems are difficulties in balance with poor stability of the head, trunk, shoulder and pelvic girdle.
- Voluntary movements are present but clumsy and uncoordinated.
- There is sometimes difficulty judging distances when moving. For example, if you ask a child to pick up an object either he reaches too far or not far enough.
- This may be accompanied by a tremor in the hands. Nystagmus i.e. uncontrolled movement of the eye-balls, may be present.
- If the child is able to stand he stands on a broad base often raising his arms ready to save himself from falling.

### **Terminology**

#### **The terminology used:**

- **Hemiplegia:** one half of the body is affected.
- **Diplegia:** involvement of whole body but lower half.
- **Quadriplegia:** All the four limbs and body are equally affected.

#### **Help**

- A child with cerebral palsy is never too young to help **the younger the better.**
- **Correct** physiotherapy and occupational therapy help to minimise the physical problems.
- Many children with cerebral palsy can manage in a mainstream school, while some children may need to go to a special school.

#### **Facts**

- A person having cerebral palsy and Locomotor disability is not mad.
- Many people with cerebral palsy have normal intelligence.
- Cerebral palsy is not hereditary.
- Cerebral palsy and Locomotor disability is not a curse. It can affect the rich and poor, irrespective of caste or creed.
- Cerebral palsy and Locomotor disabilities are not the fault of either parent.

- Cerebral palsy is not a disease. It is not infectious.
- Some Locomotor disability is preventable but not curable.

### Complementary Reading

- IICP Publication Ayesha's Story – What is CP
- IICP Publication Epilepsy

### Assessment of Basic Abilities (Can be used for children with CP and locomotor disabilities)

Need Based Assessment and Recommendations (Please tick wherever applicable)

Name	Sex	Age	Diagnosis
Address	Parents occupation	Main care giver/s at home	Educational background
Priority needs areas	Present abilities (tick wherever applicable)	Need areas (tick wherever applicable)	Recommendations/comments (tick wherever applicable)
Physical - Sitting	Can sit without support	Special chair & Tray	Already using Using it but need modification – need professional advice
	Can sit with support	Wheelchair with tray	Needs professional advice
Standing	Can stand without support	With supervision	Need to provide furniture or wall or a bar to hold on
	Can stand with support	Needs physical assistance	Needs professional advice
Mobility & Access	Can walk independently	Need supervision during play	Need supervision during climbing up staircase and getting down
	Can walk with mobility Aids	Walker Wheelchair	Already using it Needs professional advice

<b>Name</b>	<b>Sex</b>	<b>Age</b>	<b>Diagnosis</b>
		Crutches Any other	
<b>Priority needs areas</b>	<b>Present abilities (tick wherever applicable)</b>	<b>Needs (tick wherever applicable)</b>	<b>Recommendations / comments (tick wherever applicable)</b>
Eating & Drinking	Can eat & drink Independent when seated	Special chair with tray	Already using - if it needs modification see section on special furniture
	Can eat and drink with physical help	Tray to be fitted on wheelchair	See specifications given in section on special furniture
	Need to be fed	Needs caregiver to feed under guidance	Orientation to peer group/ care givers;
Toileting	Can go to toilet independently without mobility aid	Needs supervision	Orientation to peer group/ care givers; accessible toilet
	Can go independently using aid	Needs help in the toilet for taking off & putting on the clothes	Orientation to peer group/ care givers; accessible toilet
	Need to take on wheelchair	Needs help for sitting, washing and putting on and off clothes.	Orientation to peer group/ care givers; accessible toilet
Language and communication	Can speak clearly in sentences	Need orientation to listen carefully	Orientation to other students and teachers
	Can speak but speech is not clear and takes long time	Needs to be assessed	Needs professional guidance

Name	Sex	Age	Diagnosis
Writing	Communicate with signs and gesture		
	Uses communication board		
	Can write with an ordinary pen/pencil	Can use ordinary chair and table	
	Can write but slowly	Needs table and chair or special chair with tray Wheel chair with tray	Needs professional guidance
Vision	Cannot write	Needs a writer, extra time, examination concessions, objective type questions	Orientation for teachers
	Appears to be normal	No problem in class	
Hearing	Can see with difficulty	Needs eye check up	Needs professional guidance
	Uses glasses		
	Appears to be normal	No problem in the class	
	Difficulty in hearing	Needs hearing assessment & orientation in care and maintenance of hearing aids	Needs professional guidance
	Uses hearing aids		

Name	Sex	Age	Diagnosis
Language and communication	Can speak clearly in sentences]	Need orientation to listen carefully	Orientation to other students and teachers
	Can speak but speech is not clear and takes long time	Need help to communicate understand by others	Need help from expert.
	Communicate with signs and gesture	Need help to use communication board.	
	Uses communication board.		

### Complementary Reading

IICP Booklets on Physical Management, Toileting, Feeding, Dressing, Cleanliness, Play Behaviour Management, Challenging Behaviour

### What is Locomotor Disability?

#### Definition

Locomotor disability is defined as a person's inability to do any activities associated with moving both himself and objects, from place to place. This inability is due to the problem in the musculo-skeletal (muscles, bones and joints) system and or nervous system.

#### Possible Causative Factors of Locomotor Disability

Locomotor Disability could be the result of disease, injury or malformation of bones, joints, muscles, nerves, spinal cord and brain. This may be congenital or acquired.

#### 1. Congenital

- Congenital Talipes Equinovarus ((**CTEV**)or Club Foot
- Congenital Dislocation of Hip
- Congenital Mal-formation or deformities of bones and joints.

#### 2. Infective Causes

- Tuberculosis –Spine or Joints

- Acute Poliomyelitis
- Leprosy
- AIDS (Acquired immune deficiency syndrome)

### 3. Traumatic Causes

- Traffic Accidents
- Domestic Accidents
- Bullet injuries, Explosions
- Sports injuries
- Natural Catastrophes like earthquakes, floods, and landslide.

### 4. Vascular Causes

- Cardiovascular Accidents (CVA), Stroke
- Amputations due to peripheral vascular disease (Athero-sclerosis or Burger's disease)

### 5. Metabolic Causes

- Rickets
- Diabetic Neuropathy
- Vitamin B/12 deficiency
- Gout

## Types of Locomotor Disabilities and its Features

- Polio
- Rickets
- Spinal bifida
- Congenital deformities of hip/s and limb/s
- Deformities of spine
- Muscular Dystrophy Pseudo-hyper-trophy (Myopathy)

## What is Poliomyelitis?

### Definition:

Poliomyelitis is an infectious disease. It is caused by a virus and affects the spinal cord and damages the motor cells. It is transmitted by droplet infection and oral ingestion. The incubation period

varies from 3-30 days. During the period 7-14 days is the most important interval between infection and clinical illness.

### **What happens after Polio?**

- Only physical problems - paralysis/weakness of affected limb/s.
- No other associated problem like in Cerebral Palsy.
- The effect of destruction of anterior horn cells of the spinal cord is paralysis or para paresis of muscles.
- It is more usual for one or two limbs to be affected and the lower limbs are more often than the upper limbs.
- The paralyzed muscles show atrophy i.e. become thin due to lack of nutrition.
- The imbalance of muscles leads to deformity and contractures.
- No sensory problem in children as the sensory nerves are not involved.

### **Bone and Joints**

- The effect of paralysis on growing limbs results not growing so fast and this leads to shortening of limbs.
- The effect of long standing contractures joints results in the separation of joint (subluxation).
- The effect of unsupported walking on weak joints may lead to secondary deformities and contractures.

### **Assessment – to be conducted by trained medical and rehabilitation professionals**

- Must use a standardized assessment tool.
- Assessment of affected limbs, joints and spine.
- Deformity and contracture, if any.
- Other associated problems, if any.

Assessment reports must be recorded in writing with recommendations for the teacher and parents/guardians

### **Management**

- May include passive movements of affected limbs.
- Active movements.

- Passive stretching of affected muscles, joints to prevent contractures.
- Correct fittings of calipers, shoes or splints and how and when to use them.
- Correct mobility aids and method of practice.

### **Parents Involvement**

- Counseling about the disease and management programme.
- Reassurance for both parents and child.
- Information about education, awareness in the school and support.
- Awareness in the community.
- Necessary support for child and parents.

### **Follow up & Support**

Recommendations must include:

- Exercise, positioning for functional activities.
- Educational support in mainstream school.
- Awareness in the school amongst the children and teachers.
- Awareness in the community for prevention of polio.
- Equal opportunities for those who have disabilities.

### **Rickets**

In children, Vitamin D deficiency is the common cause of Rickets. It can be seen amongst children usually between 6 months to 24 months of age and above. This deficiency leads to softening of bones of limbs resulting in deformity of lower limbs – commonly, bow legs - and upper limbs. This is a preventable disease and can be treated medically if it is detected at early stage.

### **Management**

- Medical treatment is critical
- If a child has fixed deformities then s/he needs physiotherapy along with medical treatment.

Physical management should include

- Gentle mobilization of affected joints
- Careful handling

- Counseling to parents and reassurance for child and parents
- Assistive device - if required.

## Spinal Bifida

Spina bifida is a birth defect that involves the incomplete development of the spinal cord or its coverings. It's usually detected before a baby is born.

### Types of Spina Bifida

There are three types of Spina Bifida, ranging from mild to severe:

**Spina Bifida Occulta:** Characterized as an opening in one or more vertebrae of the spinal column. There is no evident damage to the spinal cord. Most children born with this form of Spina Bifida don't have health problems.

**Meningocele:** The spinal cord is intact, but the meninges (sac), which protects it is pushed out through the opening in the vertebrae. The meninges can be replaced with minimal damage to the spinal cord.

**Myelomeningocele:** The most extreme form of spina bifida, in which a section of the spinal cord protrudes through the back. Seventy to ninety per cent of babies born with myelomeningocele have hydrocephalus, a large amount of fluid in the brain. This condition requires surgery, where a shunt is inserted to drain fluid. Learning problems are particularly frequent as a result of this type of spina bifida, as are problems with mobility and paralysis.

### Treatment

In the past, babies born with spina bifida died shortly after birth. Today, early surgery is usually recommended and is often performed within the first forty-eight hours of birth. Surgery increases the survival rate and many spina bifida patients live well into adulthood; however, children with spina bifida typically require several operations during their childhood to correct defects, particularly in the hips, feet and spine.

### Possible Problems

- Hydrocephalus (large head)
- Paralysis of lower limbs
- Sensory loss of paralysed limbs
- Deformity of spine, knees, ankle and feet
- Stool and urine incontinence (lack of control of urine and stool).

## Management

Assessment - to be conducted by trained medical and rehabilitation professionals

- Physical abilities, mobility, sensory loss and bowel and bladder control.
- Careful handling to ensure that the child does not get injury or hurt as child may not feel pain due to sensory loss in paralysed limbs.
- Correct positioning on chair or wheelchair.

## Follow Up

A follow up management programme is very important particularly if a child has sensory loss; the teacher must ensure that the child is safe from cuts, bruises and other injuries or burns as the child may not be aware of these as there is very little or no pain due to loss of sensation. Regular exercise, active and passive mobilization and careful positioning are important to prevent deformity and contracture. It is also important to prevent pressure sores and infection particularly if a child has loss of bowel and bladder control. The teacher must ensure that the child goes to the toilet at regular intervals and that in case the child wets or soils himself the clothes are immediately changed and sent for washing and drying.

## Muscular Dystrophy Pseudo-hyper-trophy (Myopathy)

It is a genetic disorder disease that generally affects young children; males more females. Initially start with muscles weakness and then there is gradual deterioration of muscles. It is progressive disease and there is no cure.

## Possible Signs

- Weakness of muscles from early childhood
- The child may start falling frequently
- Gradually unable to stand although child may be able to walk in broad base once he/she is made to stand
- Gradually the condition deteriorates and the child stops walking
- Difficulty in hand function noticed in handwriting, eating and drinking
- Muscle wasting and deformity, and contractures may occur.

## Management

Assessment by trained Rehabilitation Professionals

- Physical abilities, mobility, hand function (including handwriting)

- Periodical review and support for positioning and mobility
- Parent counseling regarding cause and prevention
- Positioning, simple active and passive movements of limbs
- Breathing exercise
- No vigorous exercise.

### **Access and a Barrier-Free Environment**

1. To ensure barrier free environment for children with disability we must consider the following factors:
  - For children who are on a wheelchair
  - Who use a rollator or walker
  - Crutches or walking sticks of various types.
2. Access for getting in and out of the school
3. Getting on and off transportation (ramp, seat belts)
4. Moving within the school and in different class rooms
5. Going to toilet and play ground
6. Eating and drinking
7. Furniture
8. Creating a supportive environment in the school by changing attitude of other students, teachers and other staff who are in contact with children with disability.

### **How it can be done**

- Adhering to a Child protection policy developed/approved by the school authority
- Ensuring ramps of suitable gradients
- Providing suitable graded steps with convenient handrails in the corridors, passageways to assist in continuous movement
- Wide doors and enough space inside the bathroom for easy access for wheelchair users clearly marked
- Teaching simple skills to all staff and peer groups for helping children with disability in proper use of calipers, crutches and orthosis (assistive devices) and prosthesis (artificial limbs) if any

- Teaching staff and students about wheelchair transfers, pushing, locking and unlocking – with a positive attitude
- Ensuring unobstructed flooring including slip resistant corridors and an accessible playground for all children who are using assistive devices
- Providing appropriate furniture for individuals
- Creating awareness about children with disability, their needs, rights and the role of other students, teachers and staff
- Creating a sense of responsibility in students with disability to their school, other children and the community and respect for their teachers and family members.

## Special Furniture and Mobility Aids

### Introduction

Some children with cerebral palsy and other children with specific locomotor disability such as spinal bifida, muscular dystrophy may not be able to sit without support. The degree of support depends on the degree of disability. For many children, a table placed in front may provide adequate support. However, for children who have difficulty in controlling their head, keeping their body straight **a special chair or seat** may be required for extra support in order to maximize their physical ability for participating in classroom activities and tasks.

### Advantages of Special Furniture

If a child has difficulty controlling her head or sitting, a special seat may help in many ways:

- It will give extra support
- She will be more comfortable
- She will feel more secure, as there would be no danger of her falling out of the chair
- It will help her to maintain better posture
- She can use her physical abilities maximum for functional activities

If the child is on a wheelchair a cut-out tray should be fitted on the wheelchair for classroom tasks. The specifications are mentioned in a subsequent section.

### Disadvantages of Special Furniture

Remember, if the special furniture is not used properly, there can also be disadvantages:

Special furniture is static and usually can not be adjusted. Children grow and their posture changes with time. Therefore items of furniture need to be checked regularly to ensure that these are still suitable for the child.

Special furniture keeps the child in one position and may hence limit her activities. A prolonged period of sitting can be very tiring for a child. If she is stiff, she is also at risk of becoming stiffer or getting contractures (permanent tightness), especially in the hips and knees. Therefore it is essential to provide opportunities for the child to change position and posture from time to time.

### How to Measure a Child for a Special Seat

Whatever type of seat is recommended for your child, it is important that the measurements are taken correctly.

Following are instructions on how to measure your child for his special seat:

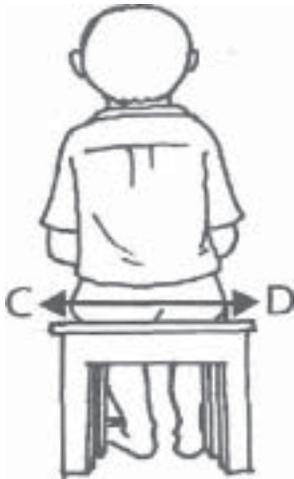
- Seat the child on a low stool (the height of the stool should be such that he can place his feet flat on the floor).
- If the child cannot sit by himself, hold him in the sitting position on the stool.
- Try to keep the child as straight as possible.



#### Seat Length

Measure from the child's back to where his knee bends (A to B).





### Seat-width

Measure the width of the child's back and add an extra 2 inches (C to D).

### Height of the Back of the Seat

Measure from the stool to the top of the shoulders (A to E)

If the child cannot hold his head straight and does not have head control, measure from the stool to the top of the child's head (A to F).



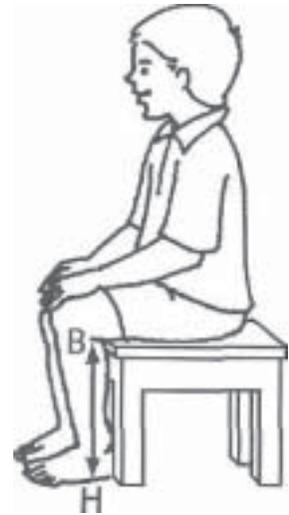
### Arm Rests (sides of the seat)

Measure from the stool to 2 inches above the child's waist (A to G)

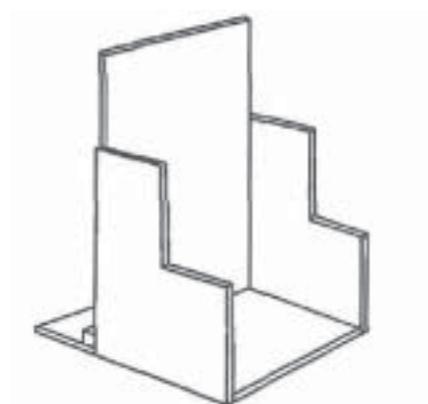


### Height of Seat from the Floor

Make sure that his knees are at right angles and his feet flat on the floor. Measure from the back of the knee to the floor (B to H)



Following are some examples of special furniture and the type of child who may benefit from using the furniture.



### Floor Seat

A floor seat is a simple seat that is suitable for children and families who sit on the floor at home or for classroom activities in junior classes, such as eating and playing. It is most suitable for small or young children.

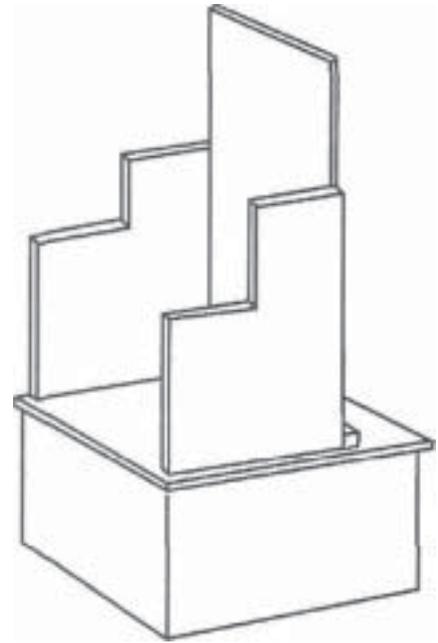
The floor seat gives support at the back and sides. If the head is not steady, it can be made higher at the back to give the child support at the back of his head. If the child is tight between the legs or tends to slip forward in the seat, a pommel can be fixed to the seat. The measurement for the pommel is given on page 7.



The measurements for the floor seat are as explained earlier. The only difference is that the measurement of the height of the seat from the floor is not required as the seat is on the floor.

### Box Seat

The same type of seat as the floor seat can be made at a higher level for the child who does not sit on the floor. The measurements for the height of the seat from the floor should then be included.



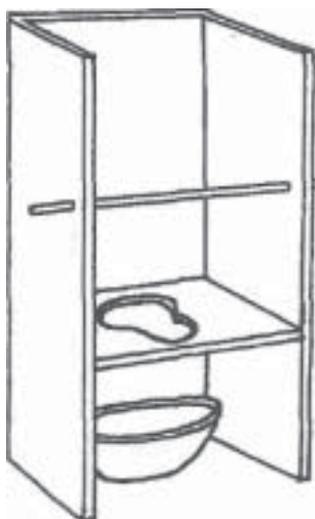
If you want to move the child around in the box seat, castors can be attached to the bottom of the seat so that it moves easily. If castors are attached, a foot rest will have to be added to the seat. To measure for the height of the foot rest, measure the child from the back of the ankle to the back of the knee (B to A).

## Potty Chair

If the child cannot sit, or has unsteady sitting balance, it is often very difficult for him to use the toilet, whether it is western or Indian style. A potty seat should give the child enough support for him to sit without being held by anyone, so he has some privacy. It can be placed in a convenient discrete place in the home. It is also useful for children who are not toilet trained and need to be taken to the toilet very regularly.



The measurements are the same as for the box seat. However the sides of the potty seat should be straight up to the shoulder. Two circular holes are made in the sides of the seat through which a rod can be inserted to ensure that the child does not fall out of the potty chair.

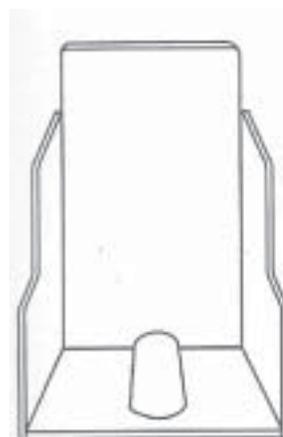


The height of the rod will be from the seat to just below the armpits. It should be at a distance of 2 inches in front of the child's chest.

There will be a hole cut in the seat of the chair through which the child passes stool or urine. A bucket or container is placed under the hole. Remember the hole in the potty seat should be pear-shaped for boys.

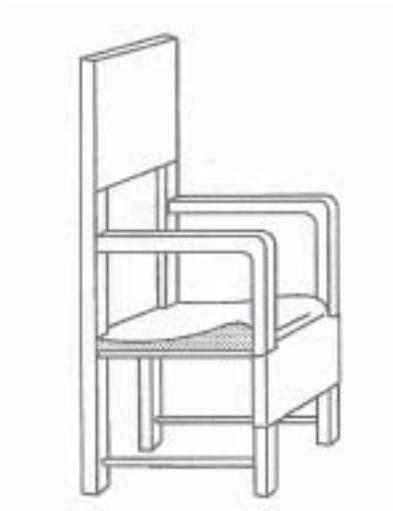
## Pommel

Some children who have tightness between their legs may require a pommel which separates the legs. It also helps to stop children slipping forward in the chair. This is a cylindrical block of wood 6 inches high and 2 inches in diameter. It is secured to the seat at a distance of 1 inch in front of the child's groin. For extra comfort, pad the pommel with 1 inch thick foam and cover it with rexine.



### Ramped Seat

Children who tend to slip forward on the seat often benefit if a ramp is fitted to the seat to prevent slipping. It is more comfortable than a pommel and often adequate to keep the child in place. If the child still slips forward even with the ramp, then a pommel may be required.



The ramp is usually two inches high at the front. It slopes gradually to cover 1/3 of the chair and becomes level with the rest of the seat. It can be made from ply wood, but should always be well padded with 1 inch thick foam which covers both the ramp and the rest of the seat.

### Pelvic Strap

A pelvic strap gives added support and stability for children who tend to slip forward in the seat. It is also a safety factor, as the child cannot fall out of the seat if left alone. The pelvic strap is always fixed at the back and below the level of the seat, so that it comes upwards and round the waist. This ensures that the child cannot slip under it. The strap should be made of thick cotton strapping 2 inches wide, which can be knotted in front.



## Padding for Seating

Children often spend a great deal of their day sitting so it is very important that the seat is comfortable and well padded. The padding usually consists of 1 inch foam. If the child is not toilet trained or if he tends to spill food when eating, it is best to cover the seat with rexine, which can be easily wiped clean and dry. If the child sweats a lot, it is advisable to place a towel over the rexine when the child is sitting in the seat. For children who do not have toilet accidents and are not likely to spill food or water, it is more comfortable to cover the seat with cloth.

When padding a seat, the back, sides and seat of the chair should all be padded.

Padding is not advisable for toilet seats.

## Floor Table

This type of table is very useful for children who sit on the floor. It is simple to make and does not take up too much space. If children have difficulty in sitting, it gives a support in front on which they can lean. They will be able to use their hands more effectively. Children who have a tendency to keep their knees bent and sit with their legs crossed or between their knees can be encouraged to sit with their legs straight if they have a floor table to lean on. The floor table can also be used with the floor seat.



There should always be raised beading round the three sides of the table not in contact with the child to prevent objects or toys from rolling off the table.

The measurement for a floor table is usually 18" X 18". However for a younger child who uses a smaller chair, the floor table can be 15" X 15".



## Cut-out Tray

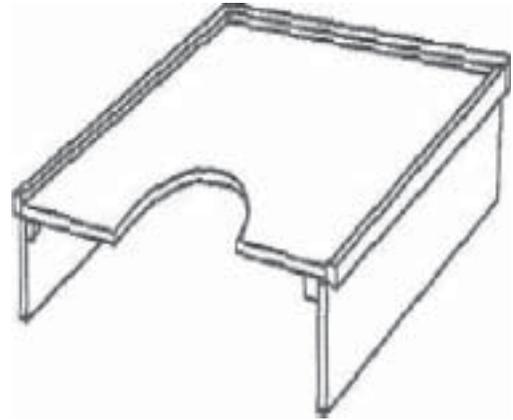
This type of tray can be fitted to a chair or wheelchair. It gives extra support for the child who tends to fall forwards or sideways when placed in a seat. The tray gives support round the trunk and enables the child to be more upright and if possible, use his hands more effectively.

The tray needs to be anchored to the chair with hooks at both sides.



It could also be made into a table, by fitting it with legs, so it can be used with a floor seat.

Measurement for the cut-out tray will be the same as a for a cut out table. The height of the table should be just above the child's waist.



The cut-out portion should be measured to fit the child. The diameter of the semi-circle should be the width of the child's waist, plus two inches (A-B). It should fit comfortably around the child.

As with the floor table, beading should be placed round the three sides of the tray.

Remember that a child will be most comfortable in a chair for which he has been measured carefully. Use the guidelines given in this booklet to help you make comfortable and safe furniture for your child.

These are just a few ideas that you might find suitable for your child. However, when possible, it is always better to seek expert advice before you embark on making a seat. Do keep in mind, as mentioned at the beginning of this booklet, that as the child grows and develops you may need to change the size and the design of the seat.

## Mobility Aids

Some children with Cerebral Palsy and Locomotor disabilities are unable to move on their own and need mobility aids. If the mobility aids is technically suitable to an individual's needs these help them to move and become independent in many functional activities.

Different sizes of wheelchairs are available in the market. The size must be correct for the child; the footrest has to be at a correct height. Always provide support straps while the child is seated.



A cutout tray can be provided if necessary for maximum support during functional activities such as eating and drinking, reading and writing.



For children who do not have functional speech and use a communication board a one-page communication display with essential phrases such as 'I need help', 'I have something to say', 'Please call/bring...' , photographs of key people, the letters of the alphabet and a number strip on the tray makes it easy to communicate with others.



Elbow crutches with a round ring for the arms



Elbow crutches with support from behind the forearms and Walking Sticks



Kaye Walker is useful for children with cerebral palsy who have a tendency of bending knees and hips during standing and moving with support.

Rollators and walkers of different sizes are available in the market or can be made with specification of the individual. It is useful for children with cerebral palsy and other locomotor disability who have a tendency of falling backward during standing and moving with support.



## Section 3

# Educational Interventions for Children with Cerebral Palsy and Locomotor Disability

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Due to the physical disability and associated problems many children with cerebral palsy have some degree of cognitive impairment. These learning difficulties may range from severe intellectual disabilities affecting all areas of the child's life through to mild or specific learning difficulties, whose only impact is on the child's educational progress.

Before we label a child as having an intellectual disability it is important to ascertain whether the difficulties in academic tasks are due to the disability or the resultant lack of exposure, access to education and denial of stimulating and enriching experiences of learning.

There are some important considerations during assessment:

- (a) Alternatives to purely motoric responses – this means that when we ask a child with cerebral palsy or a locomotor disability to copy or to do handwriting the basic difficulties with fine motor (hand function) tasks must be kept in mind. If the copied or written response is not perfect or a piece in a puzzle is not fitted with a hundred percent accuracy a near approximation must be taken as correct. For children whose physical disabilities are severe -handwritten or motoric tasks are not appropriate. Here the assessor must write for the child and in the case of puzzles and figures present the child with a multiple choice – this means that the child selects the correct option through vocalization, eye pointing or movement and the assessor does the task.
- (b) Alternatives to speech - children with cerebral palsy often have poor control of facial and respiratory muscles; the muscles of the tongue or lips may also be affected resulting in speech impairments. Furthermore, because of problems with the muscles of respiration, these children may also have insufficient breathing control to speak loudly or clearly enough to be understood. The articulation problems may range from minor difficulties to complete absence of speech. Therefore in order to assess the child with no functional speech, the assessor must keep verbal responses to the minimum using objective type questions that need a yes/no response, or a multiple choice or true/false options to questions. It is imperative for these children to gain access to augmentative and alternative communication (AAC).
- (c) Sensory deficits – the assessor must check for hearing, visual or tactile loss.
- (d) The child's emotional status must be taken into account and care must be taken to ensure the child is comfortable with the assessor.

- (e) Last but not the least – in fact of primary importance is that the child must be seated to ensure proper positioning and posture.

All-round assessment of these children will provide information in ensuring planning and decision making and implementation of programmes and plans. Assessment may be seen as an ongoing process influencing and evaluating intervention and education programmes.

Further overall assessment gives a thorough idea of the child's language and communication, the rate of learning, comprehension and retention. If alternative communication systems are necessary, physical assessment must also indicate efficient ways for the child to access the communication display. Information regarding all the mentioned factors is essential both in planning the assessment and in providing a context in which the child's responses may be interpreted. Therefore, for children with cerebral palsy, an access to multidisciplinary professionals to support teachers offers the best opportunity of obtaining a comprehensive view of the child and an integration of information across domains,

The following sections offer an idea regarding assessment and some strategies in achieving the target in the following areas:

- Reading
- Spelling
- Writing
- Number Work
- Augmentative and Alternative Communication.

### **Reading, Writing and Spelling**

Many children with cerebral palsy can develop fluent reading and spelling skills, but handwriting is a problem for the majority. Thus, right from the start the teacher has to provide reasonable accommodations:

- (a) if the child is able to write – positioning is critical, extra time should be provided and there should be no insistence on the quality of writing as long as it is legible
- (b) if the child has very jerky writing then handwriting should be waived; the child should be provided with a writer and extra time has to be given for time-bound tasks
- (c) If the child is unable to write – see point B.

### **Number Skills**

Assessment Forms Enclosed – Pre-Number/Number/ Functional Mathematics Skills

Mathematics gives us structures and solutions to many of our daily problems, if we are not able to calculate, measure, weigh then there would be no time, no calendar, no currency.

Early math experience deals with number skills and to teach number skills one has to begin with Pre-number or Basic skills.

### **Pre-Number or Basic (Foundation level) Skills**

Pre-number skills consist of all the basic skills, which a child must have, to learn

- 1) To Read
- 2) To Write and
- 3) To do Numbers.

Start teaching numbers only when a child's **pre-number** concepts are clear. The areas that make up the pre-number concepts, as well some of the ways of teaching them are given below:

1. **Measurement:** This includes knowing the difference between Big/Small, Tall/Short, Wide/narrow, Thick /Thin etc.
2. **Quantity:** This is knowing the difference between More/Less, Few/Many
3. **Capacity / Volume:** This is knowing the difference between More/Less, Full/Empty with liquids.
4. **Weighing:** This is knowing the difference between Heavy/Light
5. **Shapes:** This is knowing the difference between a Circle, Triangle, Square, Rectangle
6. **Colours:** Recognition of colours Red, Yellow, Blue, Green, Black, White.

**These concepts should be taught at 3 different levels**

- 1) With Concrete things or objects
- 2) Through pictures
- 3) In abstract.

**Teaching can be done in 5 steps**

- A) Matching
- B) Sorting
- C) Identifying
- D) Naming
- E) Generalising

For example to teach the concept of '**Big**' start with a concrete object e.g. a '**Ball**'

- A) Matching:** The objective is that the child will match two identical balls.

- B) Sorting:** The child will sort out similar balls from a container containing big and small balls.
- C) Identifying:** The child will point to the big ball when asked.

**Note:** Keep switching places of the two balls to make sure that he actually knows and is not giving a place response.

- D) Naming:** the objective here is to make the child say 'big'.
- E) Generalising:** The child is able to generalise the skill when he is able to pick out a big ball from a collection of balls of assorted sizes. Make the child practise the skill by using objects of different shapes, size & colour. Once he is able to choose the big object in any situation move on to pictures. Initially the difference in size should be very marked, this should be reduced as the child learns. The concept big, bigger, biggest should be introduced as also the concept of small. Nesting jars and stacking rings are good aids to teach this.

**Note:** Only one concept should be taught at a time. Stress the word '**big**' in the beginning. The word 'small' should be introduced only after he has learnt to say or generalize the word '**big**'.

Once the child has learnt the concept of big with concrete things then move on to pictures.

- 7) Position or Spatial Concepts:** like in/out, up/down, top/bottom, above/below, over/under, near/far, front/back, before/after.

**This should be taught in 5 steps**

- a) In relation to the body e.g. when asked the child puts his hand **up**.
- b) With objects e.g. when he puts the pencil **in** the box.
- c) In relation to the environment e.g. the bird is sitting **on** the tree.
- d) In drawings or on paper. Looking at a drawing or a picture he can say that the cat is sitting **under** the table.
- e) In the abstract or verbally - When he can relate to a thing which is not visible.

The book is on the **top** shelf of the cupboard in my room.

- 8) Concept of things that are the same both horizontally and vertically:**

- a) With objects - by matching, sorting and classifying.
- b) In pictures - by matching, sorting and classifying.

**9) Concept of things that are different both horizontally and vertically:**

- a) With objects - by matching and sorting.
- b) In pictures - by matching and sorting.

## One to One Correspondence

Putting a plate or an object for the number of people in the room, or making a tick mark for the number of objects on a page.

**Note:** At least one concept from each of the 10 areas should be taught **before the Introduction of formal numbers**

## Pictures

**Picture recognition can be taught at 3 different levels**

- A) Matching objects to pictures
- B) Matching picture to picture
- C) Recognising pictures.

### **A. Matching objects to pictures can be taught in 4 steps**

- i) Matching big coloured pictures or photographs to objects.
- ii) Matching big black and white pictures to objects
- iii) Matching big line drawings to objects.
- iv) Matching small coloured, black & white pictures and small line drawings to objects.

Once he can match objects to pictures move on to picture to picture matching.

### **B) Picture to Picture Matching**

To teach picture to picture matching follow the steps for object to picture matching but using pictures instead of objects. Starting with big coloured pictures then black & white, then line drawings and finally small of the same pictures etc

### **C) Picture Recognition**

A child may be able to match pictures. To make sure that he recognizes them the teacher should follow the identifying, naming and generalizing steps given for concrete objects.

## Activities to teach Pre-number Skills

### **1) Matching**

- a) According to shape, size, colour with concrete objects/ worksheets
- b) To show relationships- cup/saucer, tooth brush/ tooth-paste, animal/animal babies.

### **2) Making Pairs-** socks, shoes, gloves etc.

### **3) Sorting-** according to shape, size and colour first with a model and then without a model.

- 4) **Shapes**-circle, triangle, square, rectangle.
  - a) Sort plastic shapes according to shape starting with two shapes and then three and then more.
  - b) Colour different shapes in different colours on worksheets.
  - c) Making pictures using different shapes with concrete shapes /paper shapes.
- 5) **Solids** - round, cube, cone etc.
  - a) Matching identical solids.
  - b) Sorting into solids that roll/ do not roll
  - c) Building with solids.
- 6) **Making Sets** - This can be pictures of animals, birds, boys, girls, cars and other objects the child recognizes.
  - a) Make picture cards children make sets of the above items and group them together.
  - b) Make work sheets where children ring the sets that belong together.
  - c) Make worksheets where children have to draw or paste sets of various object pictures.
- 7) **Weighing**
  - a) Sorting heavy / light objects in the classroom.
  - b) Things that are big can be light -Balloon. Things that are small may be heavy - Stone.
  - c) Use of weighing scales - the heavier side goes down.
- 8) **Volume/Capacity**
  - a) Pouring of Liquids - Full/half-full /empty.
  - b) Pouring from one container to another to see which holds more.
- 9) **Sequencing**
  - a) Arranging picture Cards according to a sequence of activity e.g. Balloon, child blowing balloon, balloon bursting.
  - b) Follow a pattern - with objects using counters or by colouring according to colour, shape, size.
- 10) **Fractions - half/quarter**
  - a) Folding a napkin into half/ quarter

- b) Folding paper of different shapes into half and quarter
- c) Work sheets colouring half / quarter
- d) Cutting fruit / breaking chocolate into half/Quarter.

## Introduction to Numbers

Numbers should be introduced after the child has been given many opportunities to practice and master the pre-number skills. Then teach numbers starting with rote counting of numbers. Concept of 10 should be introduced through the houses of Units and Tens by making bundles of 10 and 1. Continue to teach rote counting up to as much as the child can learn or up to at least 20. Introduce Place Values.

## Place Values

Place Values form the basis of numbers. The value of the numerals 0-9 depends on its place value e.g. in the number 438, the numeral 3 represents 30.

**Objective:** To count a set of 10 and single objects and place them in the correct house.

**Material:** Each student gets 19 sticks and a rubber band. The teacher has a cardboard strip 8" x 4" with two transparent equal sized plastic bags stuck side by side forming pockets, With **Ones** or **Units** written on top of the right pocket and **Tens** on top of the left one. Two columns drawn on the blackboard with Ones and tens written like on the card board strip. If the student is learning in the vernacular then the appropriate word of that language should be written.

## Method

1. Ask each student to count 10 sticks and put a rubber band round it to make a bundle of 10.
2. Ask him to point to the bundle of 10.
3. Then ask him to lift up or point to the bundle of 10 and 1 stick.
4. Put the bundle of ten in the tens pocket and the single stick in the ones pocket of the card board strip. Also write what he shows on the blackboard thus: 1 ten and 1 one or 1 1 is eleven.
5. Ask him to say this aloud.
6. Similarly go sequentially up to 19 and then come back to 10 explaining to the student that the zero represents nothing in the ones house.
7. Then ask him at random show me 1 ten and 5 ones and put them in the correct house.
8. Make columns for **units** and **tens** in his book and ask him to write the numbers you dictate in their correct houses. Dictate numbers at random from 1 to 19.

## Place Values of Numbers 10 to 99

### Functional Mathematics

'Functional Maths' deals with those areas of Mathematics that we use in our daily life.

This includes

1. Pre number skills	Big / Small, More / Less and other basic concepts.
2. Number skills	Quantity, Number, Counting
3. Application skills	Money, Time, Calendar, Capacity, Weight and Mass Length and Distance.
4. Problem solving skills	Reading, understanding and application of appropriate computation in solving word problems.

### Establishing the proper learning environment

Children with Cerebral palsy may have some kind of mental retardation (sub-average intellectual functioning coupled with inappropriate behaviours) or learning difficulties. This condition, combined with attention deficits and mental retardation often call for special educational assistance. The use of tape recorders, typewriters, or computers for reading and writing problems proves helpful. The following are tips for dealing effectively with cerebral palsy children in the classroom setting:

- Some movements and noises in these children can be annoying or disruptive to the class. Please remember that these movements are occurring involuntarily, and do not react with anger or annoyance. This requires patience.
- Provide opportunities for short breaks out of the classroom.
- If the child's behaviour is particularly disruptive, consider eliminating recitation in front of the class for a while. Oral reports might be tape recorded, so those skills can be judged without the added stress of standing before the class.

### Accommodations for writing problems

- Many children with cerebral palsy also have visual-motor integration problems. Therefore, tasks that require seeing material, processing it, then writing it down are often difficult and time consuming. This problem also affects copying from the board or from a book, completing long assignments, neatness of written work, and prescribed times for completion of written work. Even very bright children with cerebral palsy who have no trouble grasping concepts may be unable to finish written work because of visual-motor impairments. Sometimes it appears as though the student is lazy or avoiding work, but in reality the effort to record the work on paper may be overwhelming. A number of accommodations can be made to help children with writing difficulties succeed in the classroom

- Modify written assignments by having the child copy down and complete every other written problem; allowing the child to present a taped report rather than a written one; allowing a parent or peer to record work so the child can dictate his/her ideas to facilitate concept formation. It helps to focus on what the child has mastered rather than the quantity of written work produced
- Since the student with visual-motor problems may not be able to write quickly enough to get important information on paper, assign a reliable “note-taking” friend or “homework partner” who can use carbon paper to make copies of notes and assignments
- When possible, allow as much time as needed for taking tests
- Students with visual-motor problems may be poor spellers. Rather than cutting marks for spelling errors, encourage proof-reading and revising the work
- Students with cerebral palsy might have problems with written math. Encourage the use of manipulatives in teaching math and the use of a calculator to perform rote calculations. Concrete examples can help a child learn a concept faster.

#### **Accommodations for language problems:**

- Provide visual input as well as auditory whenever possible. The student could receive written directions as well as oral ones, or have a copy of a lecture outline to follow while listening to instructions. Pictures and graphs that illustrate the text are usually quite effective
- Give directions one or two steps at a time. Ask the student to repeat the instructions. Then have the student complete one or two items and check with the teacher to see that they have been done properly
- If the teacher notices a student mumbling while working, suggest a seat where he/she will not disturb others. Sometimes quietly “re-auditorizing” instructions or information to himself/herself can help a student grasp and remember the assignment
- Children with cerebral palsy may repeat their own words or those of someone else. This may sound like stuttering but it actually involves the utterance of words or whole phrases. Other students may exploit this problem by whispering inappropriate things so that the child with cerebral palsy will involuntarily repeat them and get into trouble. Be alert to this provocation
- This urge to repeat can be seen in reading and writing activities. Students may be unable to complete work because they “get stuck” rereading or rewriting words or phrases over and over. This is called “looping.” The following can be helpful
- Have the student take a break or switch to other work
- When reading, give the child a note card with a cut out “window” that displays only one word

at a time. The student slides the window along while reading so the previous word is covered and the chances of getting stuck are reduced

- When writing, have the student use pencil or pen without an eraser or allow the student to complete the work orally. Brief reminders to move on may help.

### **Accommodations for attention problems**

- Seat the child in front of the teacher for all instruction and directions to minimize the visual distraction of classmates
- Seat the child away from windows, doors, or other sources of distraction. Give the student a quiet workplace. This could be in a corner, the hall, or the library. This place should not be used as a punishment, but rather a place the student can choose to go to when focusing becomes more difficult
- Have the student work in short intense periods with breaks to run an errand
- Change tasks frequently. For example, complete five math problems, then do some spelling, etc.
- Contract for work to be done in advance. For example, finish a specific number of problems by a certain reasonable time. Short assignments with frequent checks are more effective than two or three sheets of independent work at one time
- With younger children, simple gestures, such as a hand on the student's shoulder, can be a helpful reminder to focus during listening periods

### **If a child has associated mental retardation, the following might help:**

- Task analysis: break the task in to smaller units and teach unit by unit
- Frequent repetition is required till over learning takes place
- Remember the child would require much more time and practice, before the task is mastered
- Present only concrete concepts
- Multi sensory approach, also known as the visual, auditory, kninsthetic and tactile (VAKT) might prove very effective
- Use language and vocabulary with when the child is familiar
- Use a developmentally appropriate approach
- Use of visual aids, flash cards and joyful teaching-learning material may help children learn faster
- Progress should be made from simpler to more complex tasks
- Encourage the child to take initiative

- Use of computer to assist in programmed learning may be a significant part of teaching strategy. This is known as computer assisted instruction and is described briefly below.

## Computer Assisted Instruction

The computer can be used for classroom management as well as classroom instruction. Hofmeister (1984) suggests that the most appropriate use of the computer is as a supplementary tool to allow teachers more time to teach. Teachers can be partially released from time-consuming tasks through computer instruction. Computers can store sequences of instructional objectives and student performance information as well as track student progress, complete proper forms, and provide required record keeping data (Fuchs, Fuchs, & Hamlett, 1989; Kulik, Kulik, & Bangert-Drowns, 1985).

Computer assisted instruction, or CAI, refers to software that is designed to provide instruction. Attributes of CAI that appear useful in helping CP children achieve include the following:

- Tasks are analysed and presented in meaningful sequences
- Materials are presented in a manner that allows the students to progress at their own rates
- Reinforcement of individual student responses is immediate. The computer can provide continuous and positive feedback and praise, giving students a higher sense of self-esteem
- The use of animation, sound effects, and game playing situations makes drill and practice motivating
- The computer is suited to the discovery method of learning. Programmes that stimulate real life experiences allow students to make decisions and see the consequences
- Strategies related to problem solving can be adapted for the computer, through programmes such as adventure games and software that teaches how to programme
- The computer can be made “user friendly” by programming it to use students’ names during lessons. A computer also is non-judgemental and allows students to make mistakes in a non-threatening environment.

## Other Support Services

### Physical therapy:

This is meant for gross motor skills. Considered one of the mainstay therapies of CP, it is used to decrease spasticity, strengthen underlying muscles, and teach proper or functional motor patterns. A good physiotherapist will also teach the family/care givers how to help the child with CP to help themselves.

### Occupational therapy:

Occupational therapy is for developing fine motor skills and daily living activities. Another mainstay therapy for CP, it is used in much the same way as physiotherapy, primarily focusing on the hands

and arms. These therapists can also guide in feeding techniques and adaptations (self-feeding or otherwise) and for wheelchair driving too.

### **Speech and language therapy:**

Speech and language therapy, is used for improving spoken and alternative communication. Some speech therapists have additional training as oral motor specialists, and these can help with more serious issues with feeding, breathing, swallowing, and oral sensitivity.

### **Conductive education:**

A recent method of teaching children with cerebral palsy is known as conductive education (CE). The method was developed 50 years ago in Budapest, Hungary, and teaches motor skills and independence in an educational setting. Conductive educators are therapists who have been specially trained in the techniques of conductive education.

Conductive Education (CE) is an educational approach to cerebral palsy, which helps children develop the skills and motivation they need to overcome problems of movement and bodily control they encounter in everyday living. As the child with cerebral palsy reaches adulthood they may find it more difficult to use their bodies in the way they did when they were smaller. Confusion and anger may also set in as the individual becomes increasingly frustrated with their body and its limitations. The specialist educators called conductors, work closely with the cerebral palsy children enabling them to find new ways of controlling their bodies to achieve greater independence.

Many of the cerebral palsy children have increased confidence after they are taught this approach. They also gain self-assurance as they find solutions to the problems they face in everyday living. This renewed confidence in their abilities enables them to lead more active and independent lives.

### **How can conductive education help?**

Conductive education provides a lifelong system of learning for the child with cerebral palsy. Whatever the age conductive education can help a cerebral palsy child to make full use of his/her present abilities and build on them to improve the quality of life. Conductive educators possess a detailed understanding of how cerebral palsy affects every day living. The personal aim of a child having cerebral palsy is set in discussion with the conductors. Conductors then work with the child's parents to find ways of overcoming the problems that the child faces in a range of personal and social situations, which are of importance to him/her.

Throughout the child is encouraged to use the skills that child has/ in the most efficient way and to remain as active as possible to reduce the possibility of physical damage. Advice is given on how to use equipment and aids to enhance the skills that assist in moving towards independence. The set of goals are worked towards within a balanced programme, which covers all areas of motor skill including speech and breathing. Particular emphasis is placed on:

- Helping the child to increase the range and control of the movement skills
- Tasks to improve awareness of the body and enhance posture and coordination
- Developing techniques to increase level of skill in everyday activities such as getting out of bed, dressing and feeding, moving around the house
- Breathing tasks to reduce spasticity and improve circulation and general well being
- Developing the use of rhythm to help gain greater control over problems such as ataxia, spasticity and involuntary movements
- Teach the family and/or other care givers ways of helping the child build on his/her skills

Thus, conductive education helps a cerebral palsy child gain:

- Increased confidence in his/her own abilities
- Increase in level of independence
- Improvements in bodily control and mobility
- Increase in stamina
- Improved quality of life.

### **Augmentative and Alternative Communication**

Communication is a two way process. It is an exchange of information between two or more individuals. So, communication is a vehicle for social interaction and is essential for personal development.

Speech is the most obvious means of communication. Gestures, facial expressions, pointing with eyes and fingers, body language and vocalization also support the flow of communication.

Reading, writing, sign languages, pictures or Blissymbols are some of the other means of communication.

Teaching of communication skills can not be restricted to specific time or place. In fact, it should be part of the child's daily activities. Make use of all situations where the child is eager and interested.

Augmentative communication methods can provide a means of expression for people who experience loss of speech as a result of a stroke, a degenerative neurological disorder or other **multiple disabilities**.

Augmentative and Alternative Communication (AAC) is the term used to describe a broad range of communicative behaviours and methods which support and enhance the speech attempts of individuals who are unable to talk clearly.

- In traditional communication, people express themselves through meaningful spoken words.
- In non-traditional communication, meaningful gestures, signs, pictures and written words replace spoken words.
- Communication displays (boards) become the means of expression for **augmentative communicators**. Communication board vocabulary can be represented by photographs, personal or commercially available pictures, symbol systems that can have graphics (picture form) or text (in alphabet or word form).

Since communication is everybody's right, AAC can be used by anyone. We believe that everyone 'CAN' talk provided he is given the right communication system and the opportunities to communicate.

### **Essential Reading:**

- Happy Talking
- Making Communication Displays
- Using Communication Displays

### **Conclusion**

Regardless of the severity of the physical condition of the child, including him or her in co-curricular activities is essential for inclusion. There is no recipe for success – just the determination and the will of the teacher to include

Here are some suggestions:

### **Art and Craft**

There are many children who can draw and paint well. These suggestions are for those with more severe physical disabilities and limited hand function.

- Finger, Leaf and Vegetable printing
- Templates of shapes and forms that may be fixed on paper for the child with disabilities to fill in with paint or crayons
- Tearing paper for collages
- Painting within large outlines
- Block printing.

For all types of art work, the child with cerebral palsy can be a part of the process and contribute in any way he is able to.

## Dance and Drama

Children on wheelchairs can be easily included in dance and movement if the teacher choreographs the dance in a way in which the child with CP or a locomotor disability on the wheelchair or seated on a chair is a part of the sequence. Other children must push the child in or when the scene opens the child with disability must be on the stage. The hand movements should be slow and based on gross movements.

## Role Plays

Children with Cerebral Palsy play an important role in changing public perceptions about disability. They should be encouraged to speak about their strengths and needs, to lead simulation activities in which other peers try to experience what disabilities imply.

## Sports

It is obvious that due to the physical disability children with CP and locomotor disabilities have difficulties in participating in many sporting activities. But they can lead a march past; they can take part in a relay in which there are pairs comprising a walking child pushing a child on a wheelchair. These are only two examples but with imagination and conviction many more ways of participation can be worked out.

At the end of the module an interactive session should be done in which groups of teachers list out a range of co-curricular activities in which children with cerebral palsy and locomotor disabilities can participate and what accommodation they will make to ensure meaningful and effective participation.

**For recommended readings given in this module, please visit the website of Indian Institute of Cerebral Palsy - <http://www.iicpindia.org>**

## Check your Progress

- What are some of the environmental considerations for including children with locomotor impairment and cerebral palsy in schools?
- What suggestions will you give to a general teacher on how to include children with locomotor impairment and cerebral palsy in play activities and co-curricular activities?
- A general teacher has two children with CP in her classroom. What should she keep in mind while giving writing assignments to the class?
- How can resource rooms be used for children with CP?
- How will you sensitize a general teacher to the inclusion of children with CP?

