

Management of Cerebral Palsy (Evaluation)

At the end of the lecture the student should be able to:

- Know the importance of history taking of CP
- Understand the goals of physical examination
- Recognize the different areas of physical examination of CP
- Identify the different methods of physical examination of CP
- Select the proper methods of physical examination of CP

Diagnosis of Cerebral Palsy

- Early diagnosis of cerebral palsied children is very important, as it allows effective treatment and better results.
- The diagnosis of CP can sometimes be made shortly after birth, but is often postponed until the child is 18–24 months of age, in order to evaluate the functional status and the progression or regression of the symptoms.
- The diagnosis of CP has rested on the patient's **history** and **physical examination**

Evaluation of Cerebral Palsy

A- History

- History is a key component in evaluating the child .
- It provides valuable information for diagnosis.
- History taking provides the time to build a sense of understanding between the family and the physiotherapist
- Physiotherapist can know the parents' expectations from previous treatment procedures.
- Knowledge of previous treatment (e.g., physiotherapy, surgical procedures, outcomes, complications)are key issues when making a treatment plan
- The goal is to make the child and the family comfortable so that the clinical examination will be accurate.

)cont. (Evaluation of Cerebral Palsy

B- Physical Examination

Physical examination of a child with movement problem has two basic purposes:

- 1- Physical examination with a detailed history enables an accurate diagnosis.
- 2-It allows the treating physiotherapists to
 - ✓ define the impairments and disabilities,
 - ✓ determine the functional prognosis,
 - ✓ set treatment goals
 - ✓ then help devise a treatment plan for each child

Goals of physical examination

- Establish an accurate diagnosis
- Classify the type and severity of involvement
- Define the musculoskeletal impairment (spasticity, balance, weakness, contractures and deformities)
- Evaluate associated impairments and get appropriate treatment
- Determine functional prognosis
- Set treatment goals
- Devise a treatment plan
- Evaluate the outcome of previous treatment procedures
- Assess the changes that occur with treatment as well as with growth & development

Physical Examination(cont.)

Physical examination of children with CP starts by **observation** then followed by examination of the following areas:

- 1- Muscle tone
- 2- Reflexes and reactions
- 3- Muscle strength and selective motor control
- 4- Musculoskeletal system
- 5- Developmental milestones (motor skills)
- 6- Gait

Observation

- Observing the child's movements is the initial and a crucial part of the examination.
- Observe the child before you touch
- As the child adapts to the environment, slowly place him or her on the examination table or on the floor and watch him or her move around.
- If the child cries a lot and does not cooperate, continue while he or she is in the mother's lap

Observation(.Cont)

During observation, the following points must be observed and recorded:

- The way the mother carrying the child
- Spontaneous movement (UL & LL)
- Position of child (Head and trunk, UL, LL)
- Involuntary movement (present or not)
- Gait pattern(if the child is ambulant)

1- Muscle tone assessment

- Muscle tone is the resistance felt while moving the joint through a passive range of motion.
- Muscle tone disorders are categorized as:
 - Hypertonia: an increase in tone above the normal resting level.
 - Hypotonia: a decrease in tone below the normal resting level.
 - Dystonia (fluctuation): disordered tonicity
- Clinically, passive movement is used to assess the tone with the child at rest and during movement.
- Tone should be assessed through neck, trunk & extremities
- Modified Ashworth or Tardieu scales to grade spasticity.

2-Reflexes and reactions assessment

- Reflexes play a critical role in the development of the child's movement abilities.
- Reflexes are thought to provide the means by which a baby can interact with the environment and move against gravity.
- Evaluate the persistence of primitive reflexes and the absence of advanced postural reactions.
- The presence of primitive reflexes beyond 6 months of age is a sign of poor prognosis.

2-Reflexes and reactions assessment(cont.)

Reflexes and reactions are divided into four groups as follow:

- 1- Spinal reflexes
- 2- Brain stem reflexes
- 3- Mid brain reflexes
- 4- Cortical reactions

3-Assessment of muscle strength and selective motor control

- Many children with CP are suffered from **lack of selective motor control**.
- It means that those children cannot voluntarily contract or relax their muscles in isolation and therefore are unable to move their joints separately.
- Lack of selective motor control makes it impossible to determine muscle strength using simple manual muscle testing .
- So, muscle strength can be detected only by observing the children
- when performing certain tasks, such as throwing or hitting a ball.



Children who do not have selective motor control are unable to dorsiflex the ankle without moving the hip or knee; but they can produce this response in a gross flexion movement of the lower extremity. This is called pattern response. When the child flexes the hip against resistance, ankle dorsiflexion becomes apparent

4-Musculoskeletal examination

- The musculoskeletal examination reveals contractures and deformities that interfere with mobility.
- Examination of musculoskeletal system includes the following:
 - Active ROM
 - Passive ROM (Test of tightness)
 - Back assessment
 - Pelvic obliquity
 - Limb-length discrepancy

4-Musculoskeletal examination (cont.)

a- Range of motion

- Measuring the active and passive ROM
- Examine range of motion in a slow and smooth manner because sudden stretch of the muscle will increase spasticity, creating the false impression of a fixed joint contracture.
- Most young children do not have fixed deformities (dynamic deformity). This is **dynamic deformity** caused by:
 - 1- spasticity
 - 2- impaired motor control
 - 3- weakness of muscles

Common sites for contracture

Upper Limbs	Lower Limbs
Elbow flexors	Hip adductors and flexors
Forearm pronators	Knee flexors
Wrist and fingers flexors	Ankle planter flexors
Thumb adductors	



All deformities are not
apparent in many young
children when they lie supine.



Erect position is used to
demonstrate dynamic deformity

4-Musculoskeletal examination (cont.)

b- Back assessment

- Spinal deformity associated with CP might be postural or structural.
- It includes scoliosis, kyphosis, and lordosis.
- Children lacking sitting balance often have a long postural kyphosis.
- Lumbar hyperlordosis occurs in ambulatory patients with hip flexion contractures.
- Inspection of the back for scoliosis and kyphosis with the patient standing and in forward flexion.
- Examination of the back of the nonambulatory child while he or she sits in the wheelchair



Examination of nonambulatory child from sitting
Visual examination is sufficient
Scoliosis & kyphosis

4-Musculoskeletal examination (cont.)

c- Pelvic obliquity

- Pelvic obliquity is the abnormal inclination of the pelvis in the frontal plane.
- It is commonly associated with scoliosis and hip instability in the nonambulatory child.

4-Musculoskeletal examination (cont.)

d- Limb-length discrepancy

- Limb length discrepancy is a sign of pelvic obliquity or hip instability.
- Actual limb length discrepancy may occur in hemiplegic CP due to unilateral growth asymmetry.
- Measuring the actual lower limb lengths as follow:
 - from the anterior superior iliac spine to the medial malleolus.
 - from the trochanter to the knee joint line
 - and from the knee joint line to the medial malleolus



5-Assessment of motor milestones

- Accurate assessment of the individual with CP must be directed toward functional treatment planning.
- **Developmental (functional) tests as screening tool**, may be used to
 - promote early intervention for in young children
 - assist in determining diagnosis,
 - specify the child's problem,
 - facilitate planning a treatment program,
 - help the parents to understand the child's limitations

5-Assessment of motor milestones(cont.)

Different scales are used to assess the functional status of patients with CP .

Functional tests identify children who have delayed gross or fine motor development and record the progress of those children under treatment:

The most common used scales

- Denver Development Screening Test (DDST)
- Gross motor function Measure (GMFM)
- Peabody Developmental Motor Scale (PDMS)
- Bayley Scale of Infant's Development

Assessment of Gait 6-

- A crucial part of the examination is the observation of the child's walking pattern
- Ambulatory children with CP have various types of pathological gait.
- Efficient intervention depends on proper evaluation
- **Examination of gait**
 - 1- Observation
 - 2- Video recording
 - 3- Computerized gait analysis
- Observation and video recordings are sufficient to understand the abnormality in many cases

Assessment of Gait(cont.) 6-

- Videos are useful to demonstrate the child's progress to the parents and also guide treatment
- Computerized gait analysis is necessary in the few cases with more complex gait patterns **and** is possible in advanced centers

Observation

1. The child walks a distance of 10 meters.
2. Stand at a distance of 3 m., watch the child walk toward you and watch from side.
3. Look at each joint separately
4. Watch balance as the child turns.
5. Do not overtire the child.

Assignment

What is the Modified Ashworth scale

Thank you