

# Cerebral Palsy

Cerebral palsy is a group of clinical syndromes characterized by abnormal muscle tone, posture, and movement. They are due to abnormalities of the developing brain and range in severity. The syndromes themselves are not progressive but as the person ages and the brain matures, symptoms may change. Cerebral palsy can be divided into spastic syndromes, dyskinetic syndromes (involuntary repetitive movements), and ataxic cerebral palsy.

Spastic syndromes are characterized by increased tone and contractures of the affected muscles. These are the most commonly seen and will be presented here.

## Spastic hemiplegia

Sensory problems are often seen in children with spastic hemiplegia and correlate with poor growth on the affected side.

Typically, by age 5 or older, someone with spastic hemiplegia would show that:

- one side of the body is affected
- the arm is more affected than the leg
- the elbow is bent inward and the wrist and hand are flexed or bent at the joints and the fingers closed
- the hip, knee and ankle are flexed
- the arm or leg may be shorter on the affected side
- scoliosis may be present
- intellectual impairment, seizures, and vision problems are common

## Spastic quadriplegia

Persons with spastic quadriplegia are typically severely handicapped. They are more likely to have other impairments such as severe intellectual disability, visual and communication problems, feeding difficulties, lung problems and seizures.

The usual causes of spastic quadriplegia include congenital infection, cerebral (brain) development problems, and injuries during or right after birth.

Typically, by age 5 or older, someone with spastic quadriplegia would show that:

- all limbs are affected
- the upper limbs may be the same or more involved than the lower limbs
- feeding and respiratory problems are common

## Disorders related to cerebral palsy:

Cerebral palsy is often accompanied by other disorders of brain function. These include the following with the frequency of occurrence in parentheses:

- Pain (50 to 75%)

- Intellectual disability (50%) and speech–language disorders (40%)
- Epilepsy (25 to 40%)
- Vision problems (30%)
- Hip displacement (30%)
- Behavior disorder (25%)
- Bladder control problems (30 to 60%)
- Sleep disorder (20%)
- Drooling (20%)
- Hearing impairment (10 to 20%)

### **Neurodevelopmental disorders:**

Behavioral, emotional, and psychiatric disorders are commonly seen in persons with cerebral palsy. These include emotional lability, poor attention, and obsessive–compulsive traits. Features of autism spectrum disorder are seen in up to 7%, especially those with non–spastic cerebral palsy.

### **Epilepsy:**

Twenty–five to forty percent of persons with cerebral palsy will have a seizure disorder, especially in those with spastic quadriplegia. The onset of seizures is generally before age 2. Partial seizures with secondary generalization are the most common type seen. Intellectual disabilities are more commonly seen in those with seizures than in those without seizures.

### **Gastro–intestinal disorders:**

As many as 90% of people with cerebral palsy have some sort of clinically significant gastro–intestinal disorder. These include:

- Chronic constipation (60 to 70%)
- Gastroesophageal reflux and/or vomiting (approximately 50%)
- Swallowing disorders (approximately 20%)
- Abdominal pain (10 to 30%)

### **Chronic lung problems:**

Chronic lung disease is the leading cause of death in those with severe cerebral palsy. Lung problems are due to different mechanisms that often occur together and include:

- Recurrent aspiration: reflux and lack of coordination of swallowing muscles
- Scoliosis/chest wall deformities: restrict normal movement of the lung
- Weakness and poor coordination of the respiratory muscles making it difficult to take deep breaths and make it difficult to cough and clear pulmonary secretions.

## **Other disorders related to cerebral palsy:**

- Speech impairment (40 to 50%) – due to:
  - abnormal function of muscles used for speech and
  - lack of coordination of breathing
- Hearing impairment (10 to 20%)
- Orthopedic problems primarily involving hips and feet as well as scoliosis.
- Osteopenia
  - results in frequent fractures
  - causes include lack of mobility, poor nutrition due to feeding issues, and antiseizure drugs
- Urinary disorders
  - incontinence and bladder emptying problems (neurogenic bladder)

## **Risk factors that can lead to cerebral palsy:**

### **Prior to birth:**

- Prematurity
- Intrauterine growth restriction or infection
- Hemorrhage of mother shortly before birth
- Abnormalities of the placenta

### **Acquired after birth (infancy and early childhood):**

- Stroke
- Trauma
- Severe hypoxic (lack of oxygen) events such as near-drowning
- Severe infections causing sepsis or meningitis

## **Treatment:**

### **Spasticity:**

Spasticity can be a huge problem for those with cerebral palsy; not only making movement difficult but also causing pain. Botulinum toxin type A injections into the affected muscles helps to limit muscle contraction and spasm. It is felt to work better than oral muscle relaxants.

- Intrathecal baclofen: baclofen (an antispastic drug) is administered directly into the spinal canal via a pump.

### **Orthopedic interventions:**

- Are to relieve and prevent deformity and maximize function
- Muscle-tendon surgery is sometimes done to reduce the restriction of joint motion