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## **Cerebral Palsy “CP”**

### **Introduction**

Cerebral palsy (CP) is a neurological disorder affecting body movement and muscle coordination. CP is typically caused by an injury to the brain before, during, or shortly after birth. (However, it is also used as an umbrella term to describe disorders which impair the control of movement resulting from faulty development of areas of the brain.) When the brain injury occurs while the baby is still in the womb (80% of reported cases), it is difficult to explain what caused the problem. It may be caused by abnormal fetal brain development, an infection, an accident in which the mother was injured, a medical condition that the mother had during pregnancy, such as high blood pressure or diabetes, or unknown biochemical or genetic factors. If the injury occurs during birth (10% of reported cases), it is usually due to a deprivation of oxygen or an injury upon having a difficult delivery. Last, if the injury occurs after birth (10% of reported cases), it may be due to a baby being born prematurely, where his or her body is not ready to survive outside the mother’s womb, an infection, an accident where the baby is injured (i.e., motor vehicle), or bleeding in the brain. Approximately 1 in every 1,000 infants have some form of CP.

CP was first described in the 1860's by an English physician named William Little. He wrote about children who were stiff, had spastic muscles (more so in the legs than arms), and had difficulty grasping objects, crawling, and walking. The condition was called Little’s disease, however, he was describing what is now known as spastic diplegia cerebral palsy.

### **Features and Characteristics**

Children with CP have the inability to control their muscle coordination. Depending on where the damage to their brain occurred, they may have muscle tone that is too tight, too loose, or a combination of both. In addition, some children may have abnormal sensation and perception; impaired sight, hearing or speech, seizures, mental retardation, feeding difficulties, learning disabilities, bladder and bowel control, and difficulty breathing due to postural difficulties. There are four different types of cerebral palsy:

#### *Spastic Cerebral Palsy*

If the muscle tone is too high or too tight, the individual has spastic CP. Children with spastic CP often have stiff and jerky movements due to their tone. They often have a hard time moving from one position to another, and often times have difficulty letting go of an object with their hand. Spastic CP is the most common type; approximately 50% of individuals with CP have spastic CP.

### *Ataxic Cerebral Palsy*

When the individual has low muscle tone and poor coordination of movement, they are described as having ataxic CP. Children who are ataxic, look shaky (tremor-like) when trying to perform a task. They often have poor balance and may be very unsteady when they walk.

### *Athetoid Cerebral Palsy*

Athetoid CP is used to describe the individual who has both low and high tone. Children with this type of CP have difficulty holding themselves upright or steady for sitting or walking and have involuntary movements in their arms, upper bodies, and face. Because of these movements, it takes a lot of hard work and concentration to reach for an object. In addition, mixed tone causes them to have difficulty holding onto things.

### *Mixed Cerebral Palsy*

This type of CP is used to describe the individual who experiences both low and high tone.

In addition to having the different types of CP, there are also classifications for the areas of the body that the CP affects:

### *Quadriplegia*

This refers to the individual who is affected in all four limbs. Children with quadriplegia have difficulty moving all of their body parts, and often times require a wheelchair for mobility. Due to the problems controlling the muscles in their face and upper body, they may have trouble speaking and eating.

### *Hemiplegia*

This term is used to describe individuals who have CP that affects only one side of their body - either the right arm and leg or the left arm and leg - while the other side functions normally. Children with hemiplegia are able to walk and run, however, may have a slight limp or awkwardness in their gait.

### *Diplegia*

Individuals who have diplegia are only affected in their legs. Walking or running may be difficult for them, however, since their upper body is not affected, they are able to hold themselves upright and have good use of their arms and hands.

## **Diagnosis**

Physicians diagnose CP by looking at the child's motor skills, medical history, development, and characteristics described above. The physician will also test reflexes and look for early development of hand preference (babies younger than 12 months generally do not show hand preference). In addition, the physician must also rule out other disorders that can cause movement problems. The doctor must rule out that the disorder is not getting worse, as CP is not progressive. If the child is losing skills, he or she may have a genetic disorder, metabolic disorder, or muscle disease. Many times, a CT-scan, MRI, and a sonogram may be ordered as well to identify brain disorders or areas that are underdeveloped.

## **Treatment**

While there is no cure for cerebral palsy, there are several effective treatments available to improve muscle coordination and function. The child with CP should be involved in a program that addresses movement, speech, learning, and social and emotional development. Physical therapists may help children with such tasks as walking, operating their wheelchair, and standing. They can also work on more pleasurable skills such as throwing a ball or learning to ride a bike. Speech therapists can work with the child to teach them how to speak, use sign language, or use a communication device. Occupational therapists can assist children with skills such as brushing their teeth, dressing themselves, and feeding themselves. Recreational therapists help the children have fun! They can work on dance, swimming, or horseback riding. In addition to these therapists, the child should be seeing a pediatric neurologist to coordinate the child's care and an orthopedist to predict, diagnose, and treat muscle problems associated with CP.

Those individuals who are experiencing spasticity, may find drug therapy beneficial such as a muscle relaxant and antispasmodic that works by inhibiting the nervous system. These substances can be administered by a pump implanted under the skin of the abdomen (it can be taken by mouth, however, high doses are needed when taken orally).

Electrical stimulation has been used to treat muscle spasticity and tendon contracture, however, the effects of the stimulation appear to be temporary. It is usually used intermittently with a broader treatment program.

Surgery is often needed when contractures are severe. Surgeons can lengthen tendons and muscles after determining the exact muscles at fault. Selective dorsal rhizotomy is another type of surgical procedure that is used with individuals who have spasticity, in which sensory nerve fibers just dorsal to the spinal cord are identified, and then are selectively cut to diminish tone in spastic muscles of the lower limbs.

## **What to Expect**

The symptoms of CP differ from person to person, however, it doesn't always cause profound limitations. While some individuals may require a wheelchair for mobility and require life-long care, others may be only slightly awkward and need no special care at all. As the child matures, many times they will need additional services to help them function in society, such as educational and vocational training, independent living services, counseling, transportation, recreation/leisure programs, and employment opportunities - all essential to the developing adult. People with cerebral palsy can go to school, have jobs, get married, raise families, and live in homes of their own. Most of all, people with cerebral palsy need the opportunity for independence and full inclusion in our society.

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