

# Cerebral Palsy and Lower Limb Spasticity Fact Sheet

## Cerebral Palsy (CP) – An Informational Overview

Cerebral palsy (CP) is a term for a group of neurological disorders that appear in infancy or early childhood. CP affects the part of the brain that controls muscle movements, and can permanently affect body movement, muscle coordination and balance.<sup>1</sup> The majority of children with CP are born with it, although it may not be detected until months or years later.<sup>1</sup>

### Prevalence

- CP is the most common motor disability in children in the U.S., affecting an average of 1 in 323 children.<sup>2</sup>
- About 10,000 children born annually in the U.S. will develop CP.<sup>3</sup>

### Signs and Symptoms

Symptoms of CP vary greatly from person to person, ranging from mild to severe. CP does not get worse over time, although symptoms can change over a person's lifetime.<sup>1</sup> Children with CP typically have problems with movement and posture due to abnormal muscle tone.<sup>4</sup>

One of the symptoms associated with CP is spasticity – stiff or tight muscles and exaggerated reflexes.<sup>4</sup> Additional symptoms of spasticity include increased muscle tone, rapid muscle contractions, exaggerated deep tendon reflexes and/or muscle spasms.<sup>5</sup> Spasticity may also occur in association with spinal cord injury, multiple sclerosis, stroke, and brain or head trauma.<sup>5</sup>

### Types of Spastic Cerebral Palsy

- Spastic hemiplegia/hemiparesis usually affects the arm, hand, and leg on one side of the body.<sup>4</sup>
- Spastic diplegia/diparesis involves muscle stiffness that is mostly in the legs. The arms can also be affected but usually to a lesser extent.<sup>4</sup>
- Spastic quadriplegia/quadriparesis is a severe form of CP. It is caused by widespread damage to the brain or brain malformations.<sup>4</sup>
- Spastic monoplegia is a rare form of CP involving one limb.<sup>6</sup>
- Spastic paraplegia involves only the legs.<sup>6</sup>
- Spastic triplegia involves three extremities, usually both legs and one arm. This may represent hemiplegia plus paraplegia, or incomplete quadriplegia.<sup>6</sup>

## What is Pediatric Lower Limb Spasticity?

Lower limb spasticity commonly involves spasticity in the gastrocnemius and soleus muscle complex located in the calf.<sup>7,8</sup> These calf muscles, during walking, work to raise the heel from the ground.<sup>8</sup>

Common symptoms of CP besides spasticity also include<sup>1</sup>:

- Lack of muscle coordination when performing voluntary movements (ataxia)
- Walking with one foot or leg dragging
- Walking on the toes, with a crouched or a “scissored” gait
- Stiff or floppy muscle tone
- Other neurological symptoms such as seizures, hearing loss, impaired vision, bladder and bowel control issues, and pain and abnormal sensations.

## Causes

- CP is caused by a non-progressive brain injury or malformation that occurs while the child's brain is under development.<sup>9</sup> It was once believed that complications during the birthing process were a significant factor, but these account for only a small number of cases.<sup>9</sup>
- The exact causes of CP aren't always known, however, many cases are the result of health issues during pregnancy such as infections, maternal health problems or a genetic disorder.<sup>10</sup>

## Diagnosis

Early diagnosis of CP is extremely difficult as the majority of babies with CP don't show definite signs of abnormality. Often, it is impossible to diagnose CP under the age of four months, and even under six months of age in slightly affected children.<sup>11</sup>

CP is typically diagnosed by tracking a child's growth and development over time, along with developmental screening tests to see if the child has specific motor or movement delays, such as interviews or questionnaires completed by parents, or tests that the doctor gives to the child.<sup>12</sup>

Additional tests can include brain imaging tests, such as X-ray, CT scan or magnetic resonance imaging (MRI), genetic testing, or metabolic testing.<sup>12</sup>

## The Gross Motor Functioning Classification System for CP

A five-level classification system describes the gross motor function of children with CP based on their self-initiated movement, with particular emphasis on sitting, walking and wheeled mobility. The description of the five levels is broad and not intended to describe the function of individual children.<sup>13</sup>

### **Level 1**

Walks without restrictions: limitations in more advanced gross motor skills.

### **Level 2**

Walks without assistive devices: limitations walking outdoors in the community.

### **Level 3**

Walks with assistive mobility devices: limitations walking outdoors in the community.

### **Level 4**

Self-mobility with limitations: children are transported or use power mobility outdoors and in the community.

### **Level 5**

Self-mobility is severely limited even with the use of assistive technology.

## Treatment Options

No international protocols or recently-updated guidelines, based upon best-available evidence, exist for spasticity due to CP. While there is no cure for CP, there are treatments available that can improve symptoms of spasticity. These include anti-spasticity oral medications, botulinum toxin injections, surgery, braces, and physical, occupational, and speech therapy. It is important to begin a treatment program for CP as early as possible as, the earlier treatment begins, the better chance children have of managing developmental disabilities.<sup>1</sup>

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