

Cerebral Palsy

- Postural instability can affect upper extremity movement also, as children with CP may need to use their upper extremity to support upright postures against gravity. When the upper extremity is fixed and used to help stabilize and compensate for trunk weakness, the arm and hand cannot be used for functional tasks (e.g., functional mobility such as pulling self from sitting to standing or playing with toys at the midline of the body while challenged to sit unsupported).

3. Secondary Impairments

- Children with CP manifest primary impairments that are the direct result of the lesion in the CNS. Primary impairments are those that are an immediate and a direct result of the cortical lesion in the brain. Because the lesion occurs in immature brain structures, the progression of the child's motor development may appear to change, causing secondary impairments (see Box). The motor impairments of CP are almost always accompanied by one or more secondary impairments.

| Primary Impairments | Secondary Impairments |
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| <p> Muscle weakness or hypotonicity Muscle tightness or hypertonicity Spasticity Involuntary movement Weakness of eye muscles Abnormal muscle tone in facial musculature Impaired sensation in affected limbs Possible seizure disorder </p> | <p> Contracture in a joint (e.g., elbow, wrist, hip, knee, ankle) Poor or unsteady gait or mobility Impairment of visual processing, hearing, or speech Difficulty with bladder and bowel control Intellectual disability, learning disabilities Problems with breathing because of postural difficulties and weakness in trunk muscles Skin integrity: increased risk of pressure sores Difficulty in feeding, eating, and swallowing </p> |

- For many children, these secondary conditions are more disabling than their physical impairment:
- Three in four will experience chronic pain
- One in two will have an intellectual impairment
- One in three will be unable to walk
- One in three will experience hip displacement
- One in four will be unable to talk
- One in four will have epilepsy
- One in four will have a behavior disorder
- One in four will have bladder incontinence
- One in five will have a sleep disorder
- One in 10 will have a vision impairment
- One in 15 will be unable to eat orally
- One in 25 will have a hearing impairment

- Children with CP may develop secondary impairments in systems or organs over time because of the effects of one or more of the primary impairments.
- Although the initial brain injury is unchanging, the results or the secondary impairments are not static and change over time with body growth and attempts to move against gravity.
- When playing or in functional activities, children with CP move in atypical patterns that may become repetitive and fixed.

- The repetition of the atypical movement patterns prevents children with CP from gaining full voluntary control of their movements and can lead to diminished strength and musculoskeletal problems. The combination of impaired muscle coactivation and the use of reflexively controlled postures may lead to future contractures in the muscle, tendon, and ligamentous tissues, causing the tissues to become permanently shortened. Soft tissue changes can lead to contractures and possibly bone deformities; they can also cause spinal and joint misalignment.

- In addition to the risk for joint contractures and deformities and spinal or joint misalignment, children with CP are at risk for skin breakdown and decreased bone density. Children in wheelchairs, who maintain sitting or lying for extended periods or who cannot independently shift their weight, risk skin breakdown. Children who are most vulnerable may sit with their body weight pressure on body prominences for prolonged time periods.
- Children in wheelchairs also experience limited time standing or ambulating, negatively influencing the strength of the individual's bones. Children diagnosed with CP may have reduced bone mineral density and are vulnerable to pathologic fractures

- Children with CP may experience additional problems such as seizures and other medical conditions not directly related to the child's movement disorder. When postural muscles are weak, breathing can be compromised. Abnormal posture and weak muscle activity may compromise cardiac and respiratory functions and prevent these systems from working efficiently. The resulting low endurance and fatigue can influence the child's capacity for activity. The occupational therapy practitioner monitors each child's physical endurance and plans therapeutic goals to increase strength and endurance.

4. Cognition and Language

- Because CP is caused by a focal brain lesion, language and cognition may or may not be affected, depending on which areas of the brain are affected (e.g., frontal lobe, temporal lobe). Lesions affecting the frontal lobe may affect the child's cognitive abilities, including attention, organization, problem-solving, inhibition, and judgment. Lesions affecting both the primary motor and temporal lobes may affect language and speech development.

- Because speech requires complex movements of oral/facial structure and requires control of breathing, children and adults diagnosed with CP may have various problems with speech and language.
- These potential problems include decreased speech production, poor articulation, and decreased speech intelligibility. Dysarthria is the term used to describe a disorder of speech production secondary to decreased muscle coordination, paralysis, or weakness.

- In addition to speech production disorders, children who have CP may have changes in the quality of their voice resulting from limited strength or control of respiratory and postural muscles. Because CP has the potential to affect areas of the brain outside of the motor system, children who have CP can have impaired expressive and receptive language skills. This means they have difficulty processing language-based information or producing responses.

- All of these potential impairments can have a significant impact on the child's participation in age-appropriate activities with peers, understanding of and response to directions, making his or her needs known, and managing his or her own care. A child's cognitive and linguistic skill level is considered when developing goals and potential outcomes.