

CEREBRAL PALSY

Other Common Names

- Palsy; Little's Disease; Infantile Cerebral Paralysis; Static Encephalopathy.

Definition/Description

- *Cerebral Palsy* (CP) is an “umbrella term” that covers a group of non-progressive, yet often changing, motor impairment syndromes caused by lesions or anomalies in the brain that arise during the early years (before age 5) of a person's development.
 - It is important to note that CP is a neurologic disorder and NOT a disease.
 - Although CP is non-progressive, subtle changes in the manifestations of motor dysfunction can occur over time as a result of the maturation of the injured brain.

Causes/Etiology

- When CP was first described it was often associated with problems during delivery.
- It is now known that there are numerous causal factors for CP that can occur across a wide span of time, such as:
 - **Prenatal** (44%) – such as teratogens, brain malformations, chromosomal abnormalities and intrauterine infections.
 - **Labor and delivery** (19%) – such as toxemia (blood poisoning resulting from presence of toxins).
 - **Perinatal** (8%) – such as asphyxia (lack of oxygen) and premature births.
 - A strong association exists between CP and preterm birth – approximately 50% of children with CP are born before 36 weeks gestation.
 - **Early Childhood** (5%) – such as Traumatic Brain Injury (TBI), meningitis and encephalitis.
 - **No obvious cause** (24%)

Incidence

- The prevalence of cerebral palsy among children entering school is generally estimated at approximately 2 per 1,000 live births.
- In the United States it is estimated that somewhere between 500,000 and 700,000 Americans have some degree of CP.

Characteristics/Classifications

- The symptomatology of CP is extremely diverse when taken as a whole. Symptoms have been grouped together to form classification systems.
- Four major categories are typically used to categorize CP.
 - **Spastic:** Too much muscle tone or tightness that results in stiff, limited movement, especially in the arms and legs. Spastic CP is the most common type, affecting approximately 80% of all children with CP.

- **Athetoid (AKA dystonic or dyskinetic CP):** Involves slow, uncontrolled body movements and low muscle tone that makes sitting straight and walking difficult.
- **Ataxic:** Results from damage to the cerebellum, causing problems with volitional movements all over the body. Unsteadiness, lack of coordination in standing/walking and balance problems.
- **Mixed:** About 10% of children with CP will be classified as having mixed-type CP, having both spastic muscle tone and involuntary movements.
- CP is subclassified by the nature of the motor disorder as well as its distribution. This type of classification is used mainly to describe spastic types because the other motor disorders typically involve the entire body.
 - *Monoplegia:* A very rare type of CP that affects only one limb on one side of the body. These impairments are usually mild and often will disappear with time.
 - *Diplegia:* A type of CP that mainly affects the person's legs. Most people with diplegia have only limited use of their legs, however some are still able to walk independently or with assistance (i.e. splints or canes).
 - *Hemiplegia:* Only one side of the body is affected by CP. Usually the arm is more affected than the rest of the body and is held in flexion. 50% of people with hemiplegia have some loss of sensation on the effected side.
 - *Quadriplegia:* CP that affects the entire body (face, trunk, arms and legs). Feeding and speaking abilities may be significantly impaired. People with quadriplegia have difficulty with most activities of daily living.

Diagnostic and IDEA Category

- The International Statistical Classification of Diseases and Related Health Problems-9th Revision-Clinical Modification (ICD-9-CM) classifies different types of CP under the hierarchy of code **343**.
- Under the Individuals with Disabilities Education Act (IDEA), CP is considered an "**orthopedic impairment**," which is defined as

". . . a severe orthopedic impairment that adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly (e.g. clubfoot, absence of some member, etc.), impairments caused by disease (e.g., poliomyelitis, bone tuberculosis, etc.), and impairments from other causes (e.g., **cerebral palsy**, amputations, and fractures or burns that cause contractures)." ³⁴
Code of Federal Regulations Section 300.7(c)(8)

Deficits

- The same brain injury that caused the motor impairments can contribute to other problems causing children with CP to frequently have other conditions that may impede their growth and learning. These problems may include learning problems, sensory problems, or mental retardation.
 - It has been estimated that one-third of children and young adults with CP have normal, or above normal, intellectual ability; one-third have a mild cognitive impairment; and one third are moderately to severely cognitively disabled.
 - On the whole, children with athetotic or ataxic CP have the greatest learning potential; those with spastic quadriplegia have the greatest deficit.

- Children with CP may have difficulty processing visual, auditory, or tactile sensation.
 - Visual problems occur in approximately 50% of children with CP.
 - Approximately 5% to 20% of children with CP suffer from hearing loss.
 - Some persons with CP are hyposensitive (decreased sensitivity to touch) and some are hypersensitive (increased sensitivity to touch).
- A variety of perceptual disorders are common to individuals with CP.
 - The most common perceptual disorders are those related to visual processing (difficulty determining characteristics such as shape or depth visually) and tactile discrimination (the ability to discriminate objects on the basis of touch).
 - A loss of proprioceptive sensation (ability to determine position of body parts or objects in space) is also typical in children with CP.
- ADHD is more common in children with CP than non-clinical school age children.
- Children with CP may be late in starting puberty and it may last longer than normal children. Young men with CP have a higher incidence of cryptorchidism, the failure of testicular descent into the scrotum.
- People with CP are at greater risk for developing pneumonia, an infection of the lungs.

Prognosis

- CP is a life-long condition.
 - After early childhood has passed, general life expectation is not much lower than for the normal population.
- Prognosis is unknown for very young children because of the *plasticity* of a child's central nervous system—its ability to recover completely or partially after an injury. When brain injury occurs early in children the undamaged areas of a child's brain can sometimes take over some of the functions of the damaged brain areas. Therefore, while they still have some motor impairment, it is possible for some children to make great progress in other motor skills. It should be noted, however, that worse outcomes are generally associated the younger the child is when brain damage occurs.
- Damage to the brain may affect a child's motor abilities differently as the CNS organizes over time—they may improve or get worse.
 - Generally a child's motor symptoms stabilize by two to three years of age.

Cognitive Assessment Approaches

- Before testing, evaluate the nature and degree of the child's sensory and motor limitations (arm-hand use, sitting balance, speech, vision, hearing, etc.).
 - Select tests that will allow for the most accurate picture of intelligence based on the child's motor/sensory limitations and capabilities.
 - Those administering cognitive tests to a child or adolescent with CP may want to consider using select tests from the WISC-IV-Integrated.

*****ALWAYS USE CAUTION WHEN INTERPRETING TEST SCORES!*****

Interventions and Treatments

- The effects of CP can sometimes be reduced with early and ongoing treatment.
- Children with CP may benefit from one or more types of therapy such as:
 - *Occupational Therapy* to help the child to function as effectively as possible with everyday tasks.
 - *Physical Therapy* to help the child improve strength, flexibility, mobility and function.
 - *Speech and Language Therapy* to help children express their ideas and understand ideas expressed by others.
- Orthoses, also called braces or splints, can help improve mobility in children with CP by stretching muscles that are usually over-flexed or contracted or by supporting muscles with low tone. Some common types of orthoses are:
 - Ankle-foot orthoses (AFOs) that stretch the Achilles tendon.
 - Elbow braces that improve the functional use of the arm and hand involved.
 - Tone-reducing braces (inhibiting casts) that inhibit a specific motion can improve movements in other parts of the body as well as provide support and stabilize muscles.
 - Back braces can help children that have trouble maintaining upright standing or sitting postures because of a lack of trunk strength/coordination and may help to straighten the spine of children with spinal deformities.

It is very important that braces be cared for and maintained properly. Parents and other adults should frequently check children's skin for rashes, red spots, blisters and broken skin. A physician should be consulted if any of these signs are noticed. These signs and/or complaints of pain from the child might be an indicator that the child has outgrown the brace, the material in the brace has broken down or that there is merely problem of hygiene.

- Counseling could help many children with CP to deal with issues such as the frustration of not being able to communicate thoughts/needs, the sense of being different from other children, embarrassment from physical conditions such as incontinence and drooling, or being attracted to peers but not being able to act on their desires.
- Drug Therapy can help to alleviate symptoms associated with CP.
 - Drugs such as diazepam (Valium), baclofen (Lioresal), tizanidine (Zanaflex) and dantrolene can help to control spasticity. The long-term effectiveness and consequences of these drugs are not known and they may cause significant side effects such as muscle weakness, fatigue, sedation and respiratory compromise.
 - Some drugs, such as anticholinergic drugs, can help reduce the activity of the chemical messenger acetylcholine. This helps to reduce the abnormal movements associated with athetoid CP.
 - Anticonvulsants are usually prescribed for people who have seizures associated with CP. The downside to these drugs is that the body develops resistance over time and many of them are dangerous above a certain amount.
- Some children may need to use a wheelchair or walker to get from place to place.

- Assistive Technology can help many children with CP. Children who experience difficulties when speaking may benefit from an Augmentive and Alternative Communication (AAC) Device. Some examples of AAC devices are
 - Communication boards that a child uses to communicate by pointing to pictures or objects placed on the display.
 - Voice output communication aids (VOCAs) that allow the child to play recorded words or short phrases.

Research has shown that communication devices encourage the development of speech rather than replacing it.

- Some types of surgery have been beneficial for people with CP such as
 - Dorsal rhizotomy to decrease spasticity
 - Tendon lengthening surgeries and transplant measures that decrease the impact of contractures.

Contributions of the School Psychologist

- One way that school psychologists can help is by educating parents of children with CP, especially on the importance of early intervention.
- They can also be an advocate for children with CP and help to inform parents of their guaranteed rights under IDEA.
 - Example 1: Special services are required to be made available by the age of three in all states and some states have early intervention programs for infants with disabilities from birth until age three.
 - Example 2: Children who will “regress” or lose a substantial amount of progress made during the school year without summer services may have year-round services provided at public expense.
- When children and families need social service supports (ex. respite services, financial help, recreational programs, etc.), school psychologists can help connect them to specialized agencies and professionals that can provide help.
- School psychologists can help to make sure that children with CP get the assistive technology devices they need to succeed in school.

Helpful Resources:

<http://www.cdc.gov/ncbddd/>

<http://www.nichcy.org/pubs/factshe/fs2txt.htm>

<http://www.originsofcerebralpalsy.com/index.html>

<http://www.cerebralpalsy.org/>

UCP (United Cerebral Palsy Associations, Inc.)

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