

Management of Cerebral Palsy

What is cerebral palsy and how is it treated?

Cerebral palsy (CP) is a neurologic (brain) disorder that changes the way the brain communicates with the muscles. It is usually caused by abnormal development or a brain injury that creates lifelong difficulty with movement, strength, and balance. While there is no cure for cerebral palsy, the symptoms can be treated. Cerebral palsy treatment is based on the severity of the symptoms and the areas of the body involved. The goal of all treatments is to promote the child's development, range of motion, movement, and level of comfort and to maximize quality of life. Read below for several different treatment options.

Therapies

Physical, occupational, speech, and other therapies are some of the most important ways to promote the development of a child with CP.

- **Physical therapy** helps strengthen areas with low muscle tone and stretch areas with high muscle tone. It promotes flexibility and movement.
- **Occupational therapy** can help with more controlled fine motor movements and other activities of daily living, such as feeding, dressing, and writing.
- **Speech therapy** can help with speech, communication, and feeding difficulties.

Bracing

Braces are often used over joints to help stretch muscles and support joints. They can be made for almost any joint. The most common type of brace is an **ankle-foot orthotic (AFO)**, which promotes stretching of the Achilles tendon (tissue connecting the calf muscle to the heel bone) and prevents toe-walking.

Serial casting

Serial casting involves repeated casting of joints at increasing angles to stretch muscles for long periods.

Medications

Oral medications are used to relax the muscles and promote movement.

- Examples include baclofen, dantrolene, or benzodiazepines (such as clonazepam).
- They often require multiple doses daily.
- The most common side effect is sleepiness.

Baclofen can also be given intrathecally (directly into the spinal canal) through a surgically implanted pump and catheter. This method allows for:

- A continuous infusion of medication
- Dosage to be easily modified by a medical provider, without pain
- Medication in the pump to be refilled regularly through a needle insertion



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Botox injections

Botulinum toxin (Botox) is injected directly into a muscle group. It:

- Is a purified substance made from a type of bacteria.
- Works by blocking the signal from the nerve that tells a muscle to tighten. This temporarily relaxes the muscle and allows it to stretch.
- Requires injections to be repeated every few months and may require several injections depending on the treatment area.
 - If multiple areas are being treated, the child is often medically sedated (or put to sleep) at the hospital to lessen the emotional trauma and pain of numerous injections.

Electrical stimulation

Neuromuscular electrical stimulation (NMES) is used to increase muscle strength in children with CP.

- High-intensity electrical impulses generate muscle contractions (or tightening).
- Another method called threshold electrical stimulation (TECS) involves low-intensity stimulation and does not generate muscle contraction.

Surgery

Orthopedic surgeons, physical medicine and rehabilitation physicians, and neurosurgeons may be an important part of the comprehensive care team for a child with CP. Sometimes spasticity can limit movement in joints despite treatment, and surgery is needed. Surgery may:

- Help stabilize a curving spine
- Repair dislocated hips
- Release tendons that limit movement in a joint



Selective dorsal rhizotomy (SDR) is a surgical procedure performed on the spinal cord. The nerves are separated and tested through electrical stimulation. The nerves that lead to too much muscle tone are then cut.

It is important to discuss the possible benefits and risks of surgery in detail with your child's care team.

Resources and References:

<https://www.ninds.nih.gov/health-information/disorders/cerebral-palsy>

<https://www.kidshealth.org/en/parents/cerebral-palsy.html>

<https://cerebralpalsy.org/>