

respond to more conservative measures, but it is also indicated for children whose spasticity causes progressive deformities. Orthopedic surgery is generally not performed until after the child is 6 years old ([Nehring, 2010](#)). Surgery is primarily used to improve function rather than for cosmetic purposes and is followed by physical therapy. Surgery may also be performed to improve caloric intake, correct gastroesophageal reflux disease, prevent aspiration, and correct associated dental problems ([Nehring, 2010](#)).

Intense pain may occur with muscle spasms in patients with CP. Pharmacologic agents given orally (dantrolene sodium, baclofen [Lioresal], and diazepam [Valium]) have had limited effectiveness in improving muscle coordination in children with CP; however, they are effective in decreasing overall spasticity. The most common side effects of these agents include hepatotoxicity (dantrolene), drowsiness, fatigue, and muscle weakness; less commonly, central nervous system (CNS) depression, hypotension, diaphoresis, and constipation may be seen with baclofen. Diazepam is used frequently but should be restricted to older children and adolescents.

Botulinum toxin A (Botox) is also used to reduce spasticity in targeted muscles. Botulinum toxin A is injected into a selected muscle (commonly the quadriceps, gastrocnemius, or medial hamstrings) after a topical anesthetic is applied. The drug inhibits the release of acetylcholine into a specific muscle group, thereby reducing spasticity. When administered early in the course of the condition, affected muscle contractures may be minimized, particularly in the lower extremities, thus avoiding surgical procedures with possible adverse effects. The goal is to allow stretching of the muscle as it relaxes and permit ambulation with an AFO. The major reported adverse effects of botulinum toxin A injection are pain at the injection site and temporary weakness ([Lukban, Rosales, and Dressler, 2009](#)). Prime candidates for botulinum toxin A injections are children with spasticity confined to the lower extremities; the drug reduces spasticity so that the muscles can be stretched and the child may walk with or without orthoses. The onset of action occurs within 24 to 72 hours, with a peak effect observed at 2 weeks and duration of action of 3 to 6 months.

Children with CP may also experience pain as a result of surgical