



The Children's Hospital



CGMA

Center for Gait and Movement Analysis

PT20: Botulinum toxin injection (Botox) Lower extremity

Indications: A muscle or muscle group with dynamic posturing/tone but good passive range of motion. Botox can also be used to relax muscles for positioning during serial casting when a muscle contracture exists. This may increase the benefits of casting.

Procedure: Intramuscular injection of Botulinum Toxin Type A (Botox) or Botulinum Toxin Type B (Myoblock) into spastic and/or dystonic muscles. Localization of the correct muscle may require use of electrical stimulation to the selected muscle. This stimulation may be slightly uncomfortable.

Casting: Casting may be a component of Botox treatment. If there is an inadequate response to an injection of the toxin alone, casting may be applied 1-2 weeks after the toxin has been injected and will last approximately 2-3 weeks with cast changes every 7-10 days. Children with significant contractures may be casted for 3-6 weeks with frequent cast changes. In cases where it appears the contracture is severe and will extend past 4 weeks, it may be beneficial to start the casting prior to Botox and continue after the injection. This sequence may maximize the affects of Botox and encourage strengthening of the antagonist muscle following casting.

Expected Duration of effect: Approximately 2-4 months

Frequency of Treatment: Initially at three month intervals for two treatments, then at six to nine month intervals thereafter, or as established by the physician.

Precautions: Since the onset of affect occurs over the course of several days, the risk of muscle pulls following injection is low. Normal activities may be resumed on the day of the procedure.

Contraindications:

-sensitivity to injected medications

Physical Therapy Goals:

1. Improve quality of movement patterns with decreased tone and improved flexibility.
2. Increase range of motion of the affected joints and strengthen in the injected muscle.
3. Increase strength and endurance of the antagonist muscles.
4. Improve balance during stance and ambulation.
5. Improve orthotic wear and seating/positioning.

Physical Therapy Goals:

1. Maximize quality of movement with appropriate use of surrounding muscles utilizing neuromuscular retraining to minimize compensations. In the ambulatory population, begin gait training focusing on improved foot position, stride length, velocity and foot progression angle. Correct seating position and adapt transfer techniques for individuals who are non-ambulatory.
2. Passive stretching of injected muscles and strengthening in new ranges or arcs of motion.
3. Therapeutic exercise addressing hypertonicity, co-contraction, dexterity, weakness and endurance. Motor control, range of motion, strength and endurance are focuses of treatment.
4. Balance training activities encouraging ankle strategies with new available range of motion, while also stretching other muscles affecting step and stride length (e.g. hamstrings)
5. Treatment may include surface EMG biofeedback to improve motor and functional movement patterns of several muscles at once or Functional Electrical Stimulation to improve gait patterns in patients with significant muscle weakness, especially of the antagonist muscle.

6. Evaluate need for assistive devices, positioning relative to orthotics and seating equipment. Make recommendations for alterations if indicated.
7. Functional training in activities of daily living promoting maximal independence in mobility including stairs.
8. Since stride length is also affected by hips and hamstrings, these need to be assessed and treated as well.

Physical Therapy Home Exercise Program:

1. Passive, active assistive and resistive lower extremity range of motion and strengthening of injected muscles as well as the antagonists, capitalizing on effects of reduced spasticity and the potential for gains in motor performance.
2. Increase endurance of muscles by increasing ambulation distances.
3. Balance activities such as standing on pillow, walking on uneven surfaces and practicing ankle sway strategies in a corner.
4. Practice walking with heel-toe pattern along a straight line with appropriate stride length.
5. Positioning to increase stretching and use of splints, bivalved casts, immobilizers, etc., as indicated.

Special Considerations:

- Occasionally there is an initial decrease in function due to a period of adaptation to decreased tone. This is an initial safety issue, but is also an opportunity for retraining of functional skills. Discomfort at the injection site may last 24-48 hours. Check with MD if discomfort persists. Interventions will vary depending on the mobility level of child. More mobile children are more likely to benefit from patient/client-related instruction and direct intervention.

When multiple procedures are performed at the same surgical event, the post-op physical therapy care needs to default to the most conservative time frames and guidelines.