## BOTULINUM TOXIN TYPE B
(Rimabotulinum toxin B)

### THERAPEUTICS

<table>
<thead>
<tr>
<th>Brands</th>
<th>Myobloc, Neurobloc</th>
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<tbody>
<tr>
<td>Generic?</td>
<td>No</td>
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<tr>
<td>Class</td>
<td>Neurotoxin</td>
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</tbody>
</table>

#### Commonly Prescribed For
(FDA approved in bold)
- **Cervical dystonia (CD)**
- Headache
- Myofascial pain
- Certain neuropathic pain states
- Glabellar lines
- Axillary hyperhidrosis
- Strabismus and blepharospasm associated with dystonia
- Hemifacial spasm
- Spasmodic torticollis
- Spasmodic dysphonia (laryngeal dystonia)
- Writer’s cramp and other task-specific dystonias
- Spasticity associated with stroke
- Dynamic muscle contracture in cerebral palsy
- Sialorrhea (drooling)

### How the Drug Works
- Blocks neuromuscular transmission by cleaving the vesicle-associated membrane protein synaptobrevin, which inhibits the vesicular release of acetylcholine from nerve terminals
- In CD and other dystonias, produces partial denervation of muscle and localized reduction in muscle activity. In hyperhidrosis, produces chemical denervation of sweat glands
- Also appears to inhibit release of neurotransmitters involved in pain transmission (including glutamate, calcitonin gene-related peptide, and substance P) and may enter CNS via retrograde axonal transport

### How Long until It Works
- Usually 1–3 days, with peak effect beginning at 2 weeks

### If It Works
- Continue to use as long as effective, but monitor for clinical effects

### If It Doesn’t Work
- Increase dose or change injection technique. Some pain disorders may respond better to oral medications

### Best Augmenting Combos for Partial Response or Treatment Resistant
- Increase dose or number of injections, or change site of location

### Tests
- None

### ADVERSE EFFECTS (AEs)

#### How Drug Causes AEs
- Most AEs are related to muscle weakness adjacent to the site of injection. Serious systemic AEs are rare, but injectors should use the lowest dose and be familiar with injection technique to minimize AEs

#### Notable AEs
- Injection site pain and hemorrhage, dry mouth, infection, fever, headache, pruritis, and myalgia. Most AEs depend on site of injection
- CD: dysphagia, neck weakness, upper respiratory infection
- Spasmodic dysphonia: hypophonia (“breathy” voice)

#### Life-Threatening or Dangerous AEs
- Rarely patients may experience severe dysphagia requiring a feeding tube or leading to aspiration pneumonia
- Use with caution in patients with motor neuropathies or neuromuscular junctional disorders. These patients may be at greater risk for systemic weakness or respiratory problems

#### Weight Gain
- Unusual

#### Sedation
- Unusual

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### Notes

- **unusual**
- **not unusual**
- **common**
- **problematic**
What to Do about AEs
- Most AEs will improve with time (weeks)

Best Augmenting Agents for AEs
- Most AEs cannot be improved with an augmenting agent

**DOSING AND USE**

**Usual Dose Range**
- **CD**: total dose 5000–10 000 units (u)
- **Hemifacial spasm**: total dose 200–800 u
- **Spasmodic dystonia**: 50–250 u
- **Sialorrhea**: 1000 u each side, up to 2500 bilaterally

**Dosage Forms**
- Solution for injection: 5000 u/mL

**How to Dose**
- Administer every 3 months using the lowest effective dose
- **CD**: start at a low dose and adjust as needed. Limiting the dose injected into the sternocleidomastoid muscles to 2000 u or less may decrease incidence of dysphagia
- **Spasmodic dysphonia**: for more common adductor type inject 50–100 u into each side of the thyroarytenoid muscles; for abductor type inject the posterior cricoarytenoid
- **Sialorrhea**: inject 500–1000 u into each parotid gland and 250 u into each submandibular gland. The mandibular glands may also be injected

**Dosing Tips**
- Physicians should be familiar with the anatomy of the injection site and the specific disorders
- Inject using a needle or hollow electrode
- EMG recording helps to identify muscle involved in complex dystonias
- May dilute with saline but administer within 4 hours as product does not contain a perservative

**Overdose**
- Signs and symptoms of overdose may be delayed for several weeks. If accidental overdose occurs, monitor for signs of systemic weakness or paralysis

**Long-Term Use**
- Safe for long-term use

**Habit Forming**
- No

**How to Stop**
- No need to taper

**Pharmacokinetics**
- Does not reach peripheral blood after injection with recommended doses

**Drug Interactions**
- Use with caution in patients taking medications, such as aminoglycosides or curare-like compounds, that can interfere with neuromuscular transmission

**Other Warnings/Precautions**
- Contains albumin, a blood derivative that can theoretically carry risk of viral infection or Creutzfeldt–Jacob disease

**Do Not Use**
- Hypersensitivity to the drug or any of its components; infection at the proposed injection site

**SPECIAL POPULATIONS**

**Renal Impairment**
- No known effects

**Hepatic Impairment**
- No known effects

**Cardiac Impairment**
- No known effects

**Elderly**
- No known effects

**Children and Adolescents**
- Safety and effectiveness unknown

**Pregnancy**
- Category C: use only if benefit of medication outweighs risks

**Breast-Feeding**
- Concentration in breast milk unknown. Use only if benefits outweigh risk
**THE ART OF PAIN PHARMACOLOGY**

**Potential Advantages**
- Effective in CD and most likely other pain disorders, with very few AEs or drug interactions. Compared to type A may have faster onset of action and may potentially be more effective at lower doses for treating axillary hyperhidrosis.

**Potential Disadvantages**
- Cost and need for frequent injections to maintain effect. Dose requirement increases with muscle size. Effect may wear off sooner than with type A formulations.

**Primary Target Symptoms**
- Dystonia, spasticity, pain, drooling, or sweating (depending on indication).

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**Pearls**
- Botulinum toxin is most effective in focal dystonias. Generalized dystonias can be treated with anticholinergic therapy, especially in younger, cognitively normal patients.
- It often takes a series of injections to determine the optimal dose for a given patient.
- Botulinum toxin has not been extensively studied for the treatment of headache, neuropathic pain, or blepharospasm.
- Some studies indicate that type B starts working earlier than A, but that the duration of effect might be less. This could be due to the inability to convert doses, making it difficult to compare different formulations.
- Type B may disperse from injection sites to a greater extent than type A toxin.
- To date, there does not appear to be antibody production against type B toxin.

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**Suggested Reading**


