

## USE OF BOTULINUM NEUROTOXIN FOR THE TREATMENT OF MOVEMENT DISORDERS

This is a summary of the American Academy of Neurology (AAN) guidelines regarding recommended use and best practices for botulinum neurotoxin for movement disorders.

Please refer to the full guideline for detailed findings and supporting evidence at [www.aan.com](http://www.aan.com).

### RECOMMENDATIONS FOR USE OF BoNT IN MOVEMENT DISORDERS

<i>Blepharospasm</i>	Good evidence supports	BoNT injection should be considered as a treatment option ( <b>Level B<sup>+</sup></b> ).
<i>Hemifacial spasm</i>	Weak evidence supports	BoNT injection may be considered as a treatment option ( <b>Level C</b> ).
	Clinical context	The large magnitude of effects in the initial open label studies likely has discouraged efforts to study BoNT in properly controlled clinical trials. Therefore, the evidence supporting BoNT use in blepharospasm and hemifacial spasm is suboptimal. No studies have compared BoNT with other major treatment alternatives, including oral pharmacologic and surgical therapies.
<i>Cervical dystonia (CD)</i>	Strong evidence supports	BoNT injection should be offered as a treatment option ( <b>Level A</b> ).
	Weak evidence supports	BoNT is probably more efficacious and better tolerated in CD patients than treatment with trihexyphenidyl ( <b>Level B</b> ).
	Clinical context	Though commonly used for BoNT injection in CD, EMG localization technique is not established.
<i>Focal limb dystonia</i>	Good evidence supports	BoNT injection should be considered as a treatment option ( <b>Level B</b> ).
	Clinical context	Treatment of focal limb dystonia with BoNT presents challenges, particularly in achieving sufficient neuromuscular blockade to alleviate dystonic movements without causing excessive muscle weakness. While many clinicians advocate EMG or nerve stimulation guidance to optimize needle location for injection, further data are needed to establish a recommendation.
<i>Laryngeal dystonia</i>	Good evidence supports	BoNT injection should be considered as a treatment option for adductor spasmodic dysphonia ( <b>Level B</b> ).
	Insufficient evidence reports	There is insufficient evidence to support or refute the use of BoNT in abductor spasmodic dysphonia ( <b>Level U</b> ).
	Clinical context	The evidence supporting BoNT use in laryngeal disorders is suboptimal. While most clinicians utilize EMG targeting for laryngeal injections, the utility of this technique is not established in comparative trials. Dramatic results in the initial open label studies and the lack of other effective therapy likely have discouraged efforts to study BoNT in larger and more properly controlled clinical trials.

<i>Motor tics</i>	Weak evidence supports	BoNT injection may be considered as a treatment option ( <b>Level C</b> ).
	Clinical context	There are no data to compare the efficacy of BoNT and neuroleptics in the treatment of tic disorders.
<i>Tremor</i>	Good evidence supports	BoNT injection should be considered as a treatment option in patients with essential hand tremor who fail treatment with oral agents ( <b>Level B</b> ).
	Clinical context	Oral agents and deep brain stimulation are alternative treatments for essential tremor. There are presently no data comparing the efficacy of BoNT to these treatment modalities. By reducing or eliminating BoNT injection into wrist extensors, the complications of finger and hand weakness may be reduced. There are no controlled data employing the new methodology.

This guideline summary is evidence-based. The AAN uses the following definitions for the level of recommendations and classification of evidence for therapeutic intervention.

The clinical context section is made available in order to place the evidence-based guideline(s) into perspective with current practice habits and challenges. No formal practice recommendations should be inferred.

**\*Classification of Recommendations:** **A** = Established as effective, ineffective, or harmful (or established as useful/predictive or not useful/predictive) for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.\*) **B** = Probably effective, ineffective, or harmful (or probably useful/predictive or not useful/predictive) for the given condition in the specified population. (Level B rating requires at least one Class I study or two consistent Class II studies.) **C** = Possibly effective, ineffective, or harmful (or possibly useful/predictive or not useful/predictive) for the given condition in the specified population. (Level C rating requires at least one Class II study or two consistent Class III studies.) **U** = Data inadequate or conflicting; given current knowledge, treatment (test, predictor) is unproven. (Studies not meeting criteria for Class I-III).

\*In exceptional cases, one convincing Class I study may suffice for an "A" recommendation if (1) all criteria are met and/or (2) the magnitude of effect is large (relative rate improved outcome > 5 and the lower limit of the confidence interval is > 2).

**AAN Classification of Evidence for Therapeutic Intervention:** **Class I:** Randomized, controlled clinical trial with masked or objective outcome assessment, in a representative population. Relevant baseline characteristics are presented and substantially equivalent among treatment groups or there is appropriate statistical adjustment for differences. The following are required: (a) concealed allocation; (b) primary outcome(s) clearly defined; (c) exclusion/inclusion criteria clearly defined; and (d) adequate accounting for drop-outs (with at least 80% of enrolled subjects completing the study) and cross-overs with numbers sufficiently low to have minimal potential for bias. **Class II:** Prospective matched group cohort study in a representative population with masked outcome assessment that meets b-d above OR a RCT in a representative population that lacks one criteria a-d. **Class III:** All other controlled trials (including well-defined natural history controls or patients serving as own controls) in a representative population, where outcome is independently assessed, or independently derived by objective outcome measurement.\*\* **Class IV:** Studies not meeting Class I, II, or III criteria, including consensus, expert opinion, or a case report.

\*\* Objective outcome measurement: An outcome measure that is unlikely to be affected by an observer's (patient, treating physician, investigator) expectation or bias (e.g., blood tests, administrative outcome data).

This is an educational service of the American Academy of Neurology. It is designed to provide members with evidence-based guideline recommendations to assist with decision-making in patient care. It is based on an assessment of current scientific and clinical information and is not intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and the physician caring for the patient, based on the circumstances involved. Physicians are encouraged to review the full AAN guidelines carefully so they understand all recommendations associated with care of these patients.