APPENDIX A

ASSESSMENT: TRAINING GUIDELINES FOR THE USE OF BOTULINUM TOXIN FOR THE TREATMENT OF NEUROLOGICAL DISORDERS

REPORT OF THE THERAPEUTICS AND TECHNOLOGY ASSESSMENT SUBCOMMITTEE

Botulinum toxin (BTX) is a potent neuromuscular paralyzing agent that has emerged as an effective therapeutic agent for treating patients with disabling muscle spasms (for reviews, see[1–4]). Local intramuscular injections of minute doses were initially used to treat strabismus.[5] The goal was to block cholinergic neuromuscular junctions and rebalance neural input to the extraocular muscles; this blockade realigned muscle forces to straighten the eye and enhance convergence.[6] Although approved by the FDA for strabismus, blepharospasm, and related facial spasms, safe and effective off-label usage has been established for other conditions (see reviews, [1–4; 7–10]).

The purpose of this report is to propose training guidelines for the performance of BTX injections. This report does not establish standards for clinical practice; these standards will evolve from reports of experience and ongoing clinical treatment programs.

The committee of panelists was convened to represent most specialities active in using BTX. During the preparation of this report, the panelists considered many of the accepted and also potential uses, some of which are under clinical investigation,[7] including but not limited to: blepharospasm, apraxia of eyelid opening, hemifacial spasm, cervical dystonia, spasmodic dysphonia, oromandibular dystonia, writer's cramp, upper and lower limb dystonia, disabling tremor, spasticity, disabling focal tics, stuttering, hyperfunctional facial lines and muscle spasm associated with temporomandibular joint syndrome, and bruxism. It is anticipated that the proposed guidelines are such that they can be extrapolated to additional potential indications.

I. PREREQUISITE SKILLS AND KNOWLEDGE FOR THE CLINICAL USE OF BTX

A. Injection of BTX is a treatment modality. BTX therapy is not administered in a standard fashion, but must be specifically designed for each individual patient. It is often necessary to modify the procedure during ongoing therapy depending on the response to prior treatments. The depth of knowledge in clinical medicine necessary for this requires that the individual providing therapy be a licensed physician, qualified by reason of education, training, and experience in this treatment.

B. BTX should not be used by practitioners who are not skilled in managing the condition or disorder for which treatment is intended. Residents may administer BTX with appropriate supervision. Physicians using the toxin independently should possess special expertise in the diagnosis and treatment of the specific medical condition being treated. Required expertise includes a comprehension of the diagnosis, differential diagnosis, diagnostic evaluation, and treatment options with

their attendant value and risk, and skills in the management of complications. There should be a thorough knowledge of the anatomy such that muscles without superficial landmarks can be readily identified and reached by a needle. In evaluating the patient's candidacy for injection, the physician should have knowledge of the relative and absolute contraindications for administration. In addition, the patient should be under the care of a physician skilled in regulating other therapeutic agents when used either prior to or in conjunction with BTX. Treating physicians should be able to assess the therapeutic outcome of treatment, modify the therapeutic program as a function of the results of therapy, and manage patients who have a suboptimal response to BTX therapy.

C. Treating physicians should understand the pharmacology of BTX, including the mode of action, chemistry, and physiology. They should know how to transport, store, reconstitute,[11, 12] and dispense the toxin and know how to dispose of any unused toxin waste. Physicians should know how to use the supplies and any associated equipment for the stated utilization. They should know how to reconstitute toxin into accepted dilutions, the doses for administration, route of administration, needle placement, and accepted methods of delivery. The physician needs to be comfortable with penetrating the skin and muscle with a needle and possess reasonable muscle control to administer the injection. The potential for adverse effects is ever present, and preparedness to manage these adverse effects is required.

D. Treating physicians are obligated to ensure that an appropriate pretreatment clinical evaluation has been performed, that information about the potential risks and benefits of the procedure has been provided to the patient, and that adequate follow-up care is available. A pre-treatment videotape is a useful component of the medical record to document clinical status prior to therapy.

II. CONSULTATION WITH EXPERTS IN OTHER SPECIALTIES

A. The diagnosis and recommendation for treatment with BTX should be made by physicians who have the knowledge, equipment, and necessary skills to make the diagnosis and manage the condition(s). In many situations, it is recommended that a neurologist evaluate a patient who is being considered for treatment with BTX for dystonia, spasticity, or other neurological conditions. The diagnosis and management of some conditions is enhanced by a multidisciplinary approach. Some ophthalmologists treat blepharospasm independently, but neurological consultation is often useful. When a neurologist is treating eyelid spasms, ophthalmological consultation is desirable in some cases, both in excluding other entities when making the diagnosis and in managing the adverse effects of BTX. In most cases, it is recommended that laryngeal, pharyngeal, lingual, and oromandibular neurological disorders be evaluated and treated by a team comprising a neurologist, otolaryngologist, and speech language pathologist. Management of patients with spasticity may be improved by consultation with a physiatrist and/or orthopaedic surgeon. As with many disabling neurological conditions, it is recommended that patients be encouraged to participate in social support programs, such as lay support group organizations, and/or working with a social worker or psychotherapist.

B. In selected situations, a physician may have to work jointly with another specialist to develop sufficient multidisciplinary expertise.

III. FORMAL TRAINING

A. There are no standards available to assist in determining the duration of training and subsequent assessment of competency. Use of BTX in clinical practice is not a casually acquired skill. Learning the fundamentals of toxin pharmacology, preparation, and utilization in clinical practice requires a substantial investment of dedicated time. Skill improves with experience. Treatment of some disorders may become relatively straightforward, while the management of other conditions, such as cervical dystonia, present more complex variables which need to be mastered. Treatment of other conditions, such as spasmodic dysphonia, usually required a multidisciplinary approach.

B. It is recommended that treating physicians, skilled in the management of the disorders, attend at least one course sponsored by an organization approved to offer credit in category I of the AMA's physician recognition award. The course should include discussions on the basic science, clinical and practical aspects of using the toxin, and include practical demonstrations of injection techniques. A clinical observational preceptorship is strongly recommended, when available. Specialized training is required for some procedures, such as electromyography, extraocular, laryngeal, and deep intraoral needle placement, and endoscopic laryngoscopy.

IV. USE OF ELECTROMYOGRAPHY (EMG)

A. The primary role of EMG is to identify actively contracting muscle and also guide a targeted injection supplementing the clinical examination. The use of electromyographically guided injections is established as necessary when treating some conditions (strabismus; some cases of jaw dystonia; most cases of spasmodic dysphonia), and its usefulness in other conditions may vary (cervical dystonia, hemifacial spasm, limb dystonia). For some conditions, alternative delivery schemes are available. For instance, the most common procedure for the treatment of spasmodic dysphonia is EMG guided[13]; however, an indirect per-oral approach has been used successfully.[14] EMG guidance is used in many, but not all, cases of writer's cramp and foot dystonia.[15–19] Objective evidence of proper needle position within smaller deep muscles is crucial. Ultrasound has been used to assist in placing an injection needle into deep or small muscles and to provide direct visualization, such as when placing an injection needle into the deep leg muscles when treating spasticity.[20] EMG guidance is used in the treatment of some cases of cervical dystonia.[21, 22] The usefulness of EMG for the treatment of cervical dystonia has been investigated. EMG has proven a useful adjunct in identifying muscles electrically involved in patients who do not respond to clinically guided injection of readily palpable muscles[23–25]; its use extends to those patients in whom the pattern of muscle activity has changed following BTX injections.[26]

B. When performing an EMG guided injection, skill in using the equipment safely and effectively is required. The operator should have an understanding of the unit being used for EMG guidance, as well as some basic experience with the technique. Detailed knowledge of the anatomy of the region is essential.

V. LOCATION OF TREATMENT

The outpatient setting is appropriate in most cases with the proviso that appropriate emergency care is readily available if needed. Since complica-

tions, when they occur, are likely to occur in the outpatient setting, treating physicians should be available, and patients should know how to contact them in an emergency. We are aware of two cases of pneumothorax occurring after treatment of cervical dystonia. Laryngeal injection (rarely associated with laryngeal stridor), intraoral, and tongue injections should be performed in a setting with personnel capable of handling any serious immediate side effects. It is recommended that equipment necessary to provide an airway be available for this reason. However, in the over 2000 laryngeal procedures performed, stridor requiring acute respiratory intervention has not occurred. For selected patients with serious medical conditions or for some receiving injections into the pharyngeal area, hospitalization for the procedure and observation may be indicated.

This statement is provided as an educational service of the AAN. It is based on an assessment of current scientific and clinical information. It is not intended to include all possible proper methods of care for a particular neurological problem or all legitimate criteria for choosing to use a scientific procedure. Nor is it intended to exclude any reasonable alternative method. The AAN recognizes that specific decisions on patient care are the prerogative of the patient and the physician caring for the patient and are based on all the circumstances involved. Regardless of the conclusion of this statement, the Quality Standards Committee of the AAN recognizes the need to comply with state law.

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