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# Botulinum Toxin

## *A New Alternative for Pain*

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Musculoskeletal pain is the second most common complaint heard in a general practitioner's office. Although musculoskeletal pain is often self-limited and short-lived, many individuals experience chronic musculoskeletal pain. In 1998, musculoskeletal disease accounted for 10.3% of the total cost of illness classifiable by diagnostic category.<sup>1</sup> Fortunately, there are ongoing advances in our understanding of chronic musculoskeletal pain, leading to new pharmacotherapeutic options. One newer approach is the use of botulinum toxin type A (BTX-A). BTX-A is emerging as a useful and effective treatment for a variety of soft tissue and musculoskeletal disorders.

### What are its clinical uses?

BTX-A has been used in a variety of clinical disorders. A full review is beyond the scope of this article, but

interested readers can gain more information from the suggested Web sites (see box).

#### The case of Jill

Jill presented with a six-month history of focal pain in her upper trapezius fibres secondary to an aggressive massage. Previous treatments included non-steroidal anti-inflammatories, analgesics, massage, physical therapy, and rest. These treatments failed to give her any relief.



Botulinum toxin A (100 units) was injected into the trigger point and along the taut band. A home scapular stabilizing and shoulder/neck stretching program was initiated.

The patient reported four to five months of excellent pain relief and has had a further injection. She has been able to return to her retirement pursuit of daily golfing.



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## Botulinum toxin

Table 1

### Conditions for which botulinum toxin may be used

- Low back pain
- Myofascial pain syndromes with focal trigger points
- Migraine headaches/tension headaches
- Dystonia
- Chronic, non-specific myalgia
- Chronic lateral epicondylar pain (tennis elbow)
- Post-radiculopathy pain/spasms
- Piriformis syndrome
- Thoracic outlet syndrome
- Neuropathic pain/complex regional pain syndrome
- Other chronic soft tissue/muscle pain syndromes
- Temporomandibular disorder
- Chronic pelvic pain

Myofascial pain syndrome is a regional musculoskeletal syndrome characterized by muscle pain, stiffness, and myofascial trigger points. There are a number of encouraging clinical trials.<sup>2-5</sup> However, results are mixed and further studies using randomized, controlled trials are needed. It is my opinion that BTX-A can improve outcomes in many patients with myofascial pain when attention is paid to muscle choice, dosage, and injection techniques.

Low back pain is an entity that is common, yet difficult to treat when it becomes chronic. Foster et al. completed a randomized, double-blind trial that showed a positive outcome.<sup>6</sup> In this study, 60% of patients receiving BTX-A

### The case of Hillary

Hillary was using narcotic analgesics in escalating dosages for chronic neck and shoulder pain for more than 10 years. Clinically, she had a very tender and tight upper trapezius muscle with a localized trigger point.

Hillary was injected with botulinum toxin A (100 units) into the trigger point and taut band. The patient declined further physical therapy.

Since the injection, she has been able to reduce her narcotic medications by more than 75% and continues to taper them. Her pain is significantly reduced and her quality of life has increased.

### The case of Kay

Kay presented with regional trapezius and shoulder pain following an orthopedic procedure for shoulder instability. She had restricted range of motion (ROM), decreased strength, and was unable to progress with physical therapy due to increasing pain.

Botulinum toxin A (100 units) was injected into the trapezius muscle's trigger point and taut band. Continuation of her previous physical therapy program was instituted at approximately four weeks post-injection.

Full and complete pain relief with near normal ROM was obtained within approximately six weeks. No further pain has been reported and the patient has returned to her job as a police officer with no need for ongoing treatments or therapy.

(compared to 13% of those receiving saline injections) reported greater than 50% pain relief at eight weeks. These same patients showed improvement on the Oswestry Low Back Pain Questionnaire, suggesting improved

function. Six of 10 patients reported three to four months of pain relief.

BTX-A has been found to have positive outcomes in clinical trials for the treatment of tennis elbow,<sup>7</sup> temporomandibular disorder,<sup>8</sup> piriformis syndrome,<sup>9</sup> and neurogenic thoracic outlet syndrome.<sup>10</sup>

Randomized and controlled trials are required to further delineate the usefulness of BTX-A in the realm of musculoskeletal medicine. Table 1 lists possible diagnoses in which BTX-A may be useful.

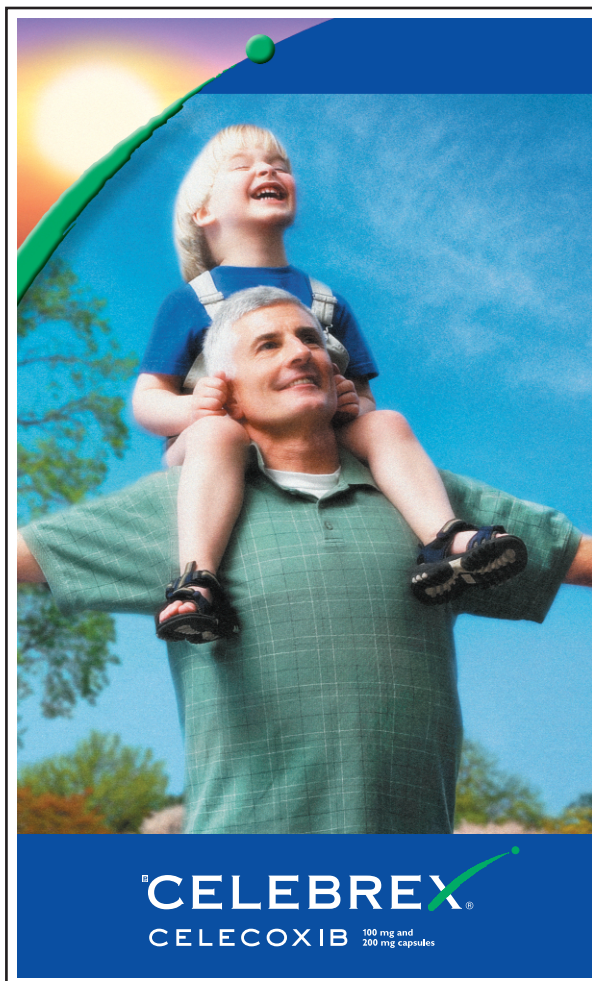
## Where does BTX-A fit?

BTX-A is not generally considered a first-line treatment. If, however, traditional methods of treatment fail to give adequate pain relief, BTX-A may be useful at decreasing pain to allow for greater success with exercise regimens. In some individuals, BTX-A can be effective as the sole treatment.

The goal with BTX-A is to use a series of injections in order to help a patient obtain long-lasting pain relief. BTX-A should be used in conjunction with a specific treatment plan aimed at addressing the primary,

underlying pain complaint, underlying biomechanical dysfunction, and any other associated problems.

Ultimately, success will depend upon a comprehensive, multidisciplinary treatment plan using appropriately timed complementary treatments (Table 2).



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# Botulinum toxin

Table 2

## Complementary treatments to BTX-A

- Physical therapy
- Activity modification
- Analgesics
- Anti-inflammatories
- Psychotherapy
- Biofeedback
- Orthotic devices/aides
- Acupuncture
- Yoga

## How is the injection performed and what are the risks?

The majority of BTX-A injections are performed intramuscularly, although there are some reports suggesting the potential benefit of intradermal/subcutaneous injections.<sup>11</sup> The clinician can perform injections using electromyography (EMG) guidance, motor point stimulation, or blind techniques. There are no universally accepted injection approaches. Some authors endorse the “chase-the-pain-or-tenderness” paradigm as their guide. Lang reported a study treating myofascial pain using a grid pattern into the mid-belly of the injected muscles.<sup>5</sup> There are no studies comparing one injection technique to another and it appears as though the most important factor is ensuring

Table 3

## Side-effects of BTX-A

### Common

- Localized tenderness
- Localized soreness
- Localized bruising

### Less common

- Nausea
- Muscle soreness
- Headaches
- Light-headedness
- Fever
- Chills
- Hypertension
- Weakness
- Abdominal pain
- Diarrhea

BTX-A is injected into the intended muscle(s).

BTX-A treatments are actually quite safe. BTX-A is the most studied brand of botulinum toxin and has been used to treat over 1 million patients worldwide for over 11 years. Side-effects are generally short-lived and uncommon (Table 3). Some other adverse effects that relate to the specific regions being injected (*i.e.*, injections around the neck may lead to dysphagia, dysarthria, hoarseness, drooling, difficulties with singing, and neck weakness). A thorough anatomic knowledge of the muscles, nerves, tendons, and vasculature is essential prior to performing injections.



In order to maximize benefit and limit potential adverse effects, careful dosage and needle placement are essential. Overuse can result in increased pain and dysfunction, whereas underuse or poor needle placement will result in an ineffective treatment.

There are a variety of different BTX formulations. In Canada, we have BTX-A (Botox®). Dosing and potency are specific for each BTX formulation and cannot be interchanged.

### When do I refer for treatment?

A simple set of criteria can be used to determine when referral is necessary. Some are:

1. Research-based indications (low back pain, myofascial pain, tennis elbow, piriformis syndrome, *etc.*);
2. Lack of response to conventional physical and medical therapies;
3. Short-term relief via a trigger point injection with lidocaine or dry needling; and
4. A focal pain problem that behaves in a predictable manner and interferes with function (often associated with pain on passive or active stretching in the clinical setting of an active trigger point).

Some practitioners may advocate early use so as to avoid or limit the potential for chronic pain. Although this idea is intriguing, the argument has not been assessed in the literature at this time.

The ultimate use of the medication in any given case will depend upon the patient's presentation, comorbidities, response to previous treatments,

and willingness to accept treatment.



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## Botulinum toxin



### Take-home message

#### *When is BTX-A used?*

- BTX-A can be used to treat myofascial pain, low back pain, tennis elbow, temporomandibular disorder, piriformis syndrome, and neurogenic thoracic outlet syndrome.
- Although BTX-A is not usually the first-line treatment for pain, its use in conjunction with other complementary treatments can improve pain and function significantly.
- While BTX-A is safe to use, there are some side-effects (Table 3).

### What's the bottom line?

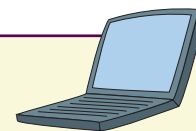
BTX-A, when carefully used in a treatment program, is an effective, safe, and reasonable treatment consideration for many chronic musculoskeletal pain syndromes. BTX-A should be a component of a comprehensive treatment strategy aimed at returning a patient to a higher level of function with reduced pain and overall improvement in quality of life.

BTX-A should be administered by physicians who are knowledgeable and experienced in diagnosing and treating the conditions for which treatment is being considered. The physician should have considerable expertise with intramuscular injections for therapeutic use and be trained in the usage of BTX-A.

Further studies are needed to establish the efficacy of BTX-A in the vast number of disorders for which it can potentially be used. In properly selected patients and with skilled administration, BTX-A may prove to be a cost and clinically effective treatment in many of your chronic musculoskeletal pain patients. [Dx](#)

#### Surf your way to...

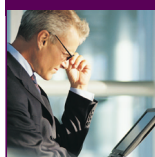
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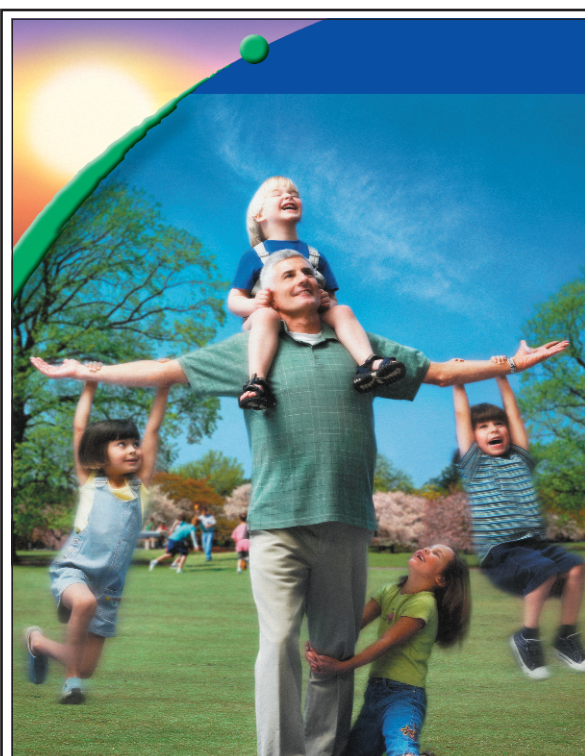
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