

Trapezius botulinum toxin: neuromuscular modulation for shoulder tension, postural dysfunction, and *aesthetic contouring*



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Neck and shoulder discomfort are among the most frequent complaints seen in both medical and aesthetic settings. Many patients spend long hours at a desk, often in suboptimal postures, which leads to sustained activation of the cervical and upper thoracic musculature. Over time, this creates a pattern of habitual shoulder elevation and increased reliance on the upper trapezius.

The trapezius is particularly vulnerable to this type of chronic overuse. Patients often present with a combination of symptoms, including stiffness, muscle fatigue, tension headaches, and reduced range of movement. In some cases, there is also a visible increase in muscle bulk, which can become an aesthetic concern.

Botulinum toxin type A has long been used to manage muscular hyperactivity. Its ability to temporarily reduce neuromuscular transmission makes it a useful tool in a range of clinical scenarios. More recently, attention has shifted toward its role in managing trapezius overactivity, both from a functional and aesthetic perspective. (Jeong et al, 2017). It is important to acknowledge that use in this area is off-label. As such, patient selection, consent, and practitioner expertise are essential.

Anatomy and functional role of the trapezius

The trapezius is a large, superficial muscle extending from the occipital region down to the upper thoracic

Abstract

Neck and shoulder tension are increasingly common in modern clinical practice, largely driven by sedentary lifestyles, prolonged desk-based work, and chronic stress. The trapezius muscle plays a central role in connecting the shoulders, cervical spine, and overall posture. When this muscle remains overactive for prolonged periods, it can lead to pain, stiffness, restricted movement, and in some cases visible hypertrophy that alters shoulder contour. Botulinum toxin type A has emerged as a potential tool to address excessive neuromuscular activity within the trapezius. By temporarily reducing muscle contraction, it may provide both symptomatic relief and aesthetic improvement. In recent years, its use in this area has expanded beyond therapeutic indications to include shoulder contouring. This article explores the anatomical and functional role of the trapezius, the mechanisms underlying chronic overactivity, and the clinical applications of botulinum toxin in this context. Practical considerations, limitations, and the importance of combining treatment with movement-based approaches are also discussed.

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Key words

► Trapezius hypertrophy ► aesthetic contouring ► botulinum toxin ► postural dysfunction ► shoulder contouring ► barbie botox



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CPD reflective questions

- How can I improve my assessment of trapezius overactivity to differentiate between muscular tension, postural dysfunction, and structural causes of shoulder pain?
- What considerations are essential when obtaining informed consent for off-label botulinum toxin treatment in the trapezius region?
- How can conservative dosing and accurate injection technique reduce the risk of affecting shoulder function and movement?
- In what ways could integrating physiotherapy, posture correction, or movement retraining improve long-term patient outcomes following treatment?
- What further training or evidence-based learning do I need to strengthen my understanding of trapezius anatomy, patient selection, and treatment safety?

spine and laterally to the clavicle and scapula. It is typically divided into upper, middle, and lower fibres, each contributing to different aspects of scapular movement and stability.

The upper trapezius is most relevant in this context. It plays a key role in shoulder elevation and assists in maintaining head and neck posture. Because of its involvement in both static posture and dynamic movement, it is particularly susceptible to overuse. (Johnson et al, 1994).

In patients with poor postural habits or repetitive strain, this muscle often becomes dominant. Over time, this can result in increased tone, tenderness, and reduced flexibility. In some individuals, prolonged overactivity may also lead to hypertrophy, which can alter the overall shoulder silhouette.

Pathophysiology of trapezius overactivity

Chronic overactivity of the trapezius is rarely due to a single factor. More commonly, it reflects a combination of mechanical, behavioural, and neurological influences.

From a mechanical perspective, prolonged sitting and forward head posture increase the demand placed on the upper trapezius. Even low-level, sustained contraction over many hours can lead to fatigue and discomfort (Jensen et al, 1999).

At a muscular level, patients may develop trigger points, which are localised areas of increased sensitivity within the muscle. These can produce referred pain patterns, often extending into the neck or head (Huang et al, 2022).

There is also a central component to consider. Persistent input from overactive muscles can alter pain perception and increase sensitivity over time. Stress further contributes by increasing baseline muscle tension. With ongoing overuse, structural changes may occur, including increased muscle thickness. This is particularly relevant in patients seeking treatment for aesthetic reasons, where shoulder width and contour become a concern.

Mechanism of action of botulinum toxin

Botulinum toxin type A works by blocking the release of acetylcholine at the neuromuscular junction. This prevents muscle contraction and leads to a temporary reduction in muscle activity.

Following injection, effects begin to develop over several days and typically peak within a few weeks. As the muscle remains underactive, there is a gradual reduction in tone. With repeated treatments, some degree of muscle thinning may occur due to reduced use (Zhou et al, 2018). In the trapezius, this translates into decreased tension and, in selected patients, a visible softening of muscle bulk.



Clinical applications

Therapeutic use

From a functional perspective, botulinum toxin may be considered in patients with chronic shoulder tension, trapezius myalgia, or tension-type headaches associated with muscle overactivity. Many patients report a

reduction in baseline tension and improved comfort, particularly when symptoms are clearly linked to muscular overuse.

Aesthetic use

Aesthetically, the goal is different. In patients with hypertrophy of the upper trapezius, treatment can



Image 1: before trapezius botulinum toxin



Image 2: after trapezius botulinum toxin

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Key points

- **The upper trapezius is highly susceptible to chronic overactivity:**
Modern sedentary lifestyles, prolonged desk work, poor posture, and stress contribute to persistent activation of the upper trapezius, leading to pain, stiffness, tension headaches, and reduced mobility.
- **Botulinum toxin type A reduces neuromuscular overactivity:**
Botulinum toxin works by blocking acetylcholine release at the neuromuscular junction, temporarily decreasing muscle contraction and reducing muscle tone, tension, and in some cases hypertrophy.
- **Treatment has both therapeutic and aesthetic applications:**
Therapeutically, trapezius toxin injections may relieve chronic shoulder tension and myalgia. Aesthetically, they can soften trapezius hypertrophy to create a slimmer shoulder contour and elongated neck appearance.
- **Careful patient selection and conservative dosing are essential:**
Because trapezius treatment is off-label, practitioners must ensure informed consent, strong anatomical knowledge, tailored dosing, and cautious injection technique to avoid compromising shoulder function.
- **Botulinum toxin should be integrated with movement-based rehabilitation:**
The article emphasises that toxin treatment alone does not correct underlying postural or behavioural causes. Long-term outcomes improve when combined with physiotherapy, pilates, ergonomic correction, and movement retraining.

create a more elongated neck and a narrower shoulder line. This effect is gradual and depends on both muscle size and individual response. It is not an immediate change, and expectations must be managed accordingly (Jeong et al, 2017).

Evidence and clinical perspective

While there is growing interest in trapezius botulinum toxin treatment, the evidence base remains relatively limited. Some studies suggest benefits in both pain reduction and aesthetic contouring, but protocols vary and long-term data are still evolving.

In clinical practice, outcomes tend to be highly patient-dependent. The best results are often seen in individuals with clear muscle overactivity rather than those with primarily structural or postural issues (Hsu et al, 2020).

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Injection technique

Treatment requires a good understanding of anatomy and careful patient assessment. Injection points are usually distributed across the upper trapezius, between the cervical spine and the acromion. Using multiple points allows for more even distribution of the toxin. A conservative approach is generally preferred, particularly in first-time patients. Over-treatment can affect shoulder function, which is especially important in physically active individuals. Symmetry is key, and dosing should be tailored to muscle bulk and patient needs rather than applied uniformly (Wang et al, 2023).

Case study

A patient in her late thirties presented with chronic shoulder tension and concern about the prominence of her trapezius muscles. She described frequent stiffness and occasional tension headaches, particularly after long hours at a desk. On examination, there was clear hypertrophy of the upper trapezius and a tendency to elevate the shoulders at rest. Botulinum toxin was administered across multiple points in the upper trapezius. At follow-up, the patient reported a noticeable reduction in tension and improved comfort. There was also a visible softening of the shoulder contour.

Integration with movement and posture

It is important to emphasise that botulinum toxin does not address the underlying cause of trapezius overactivity. For more sustainable results, treatment should be combined with strategies that target posture and movement patterns. This may include physiotherapy, pilates, or other forms of rehabilitation aimed at reducing reliance on the trapezius and improving muscular balance.

In many cases, reducing muscle tone temporarily creates an opportunity for patients to retrain how they move and hold tension.

Conclusion

Trapezius botulinum toxin injections are gaining relevance as both a therapeutic and aesthetic intervention. By reducing neuromuscular activity, treatment can help alleviate muscle tension and, in selected cases, improve shoulder contour (Park et al, 2025).

However, it is not a standalone solution. Results are often more meaningful when treatment is combined with efforts to address posture, movement, and lifestyle factors. Given its off-label nature, careful patient selection, informed consent, and a strong understanding of anatomy are essential. When used thoughtfully and conservatively, botulinum toxin can be a valuable addition to the management of trapezius overactivity. 

References

- Hsu P-C, Wu W-T, Han D-S, Chang K-V. Comparative Effectiveness of Botulinum Toxin Injection for Chronic Shoulder Pain: A Meta-Analysis of Randomized Controlled Trials. *Toxins* (Basel). 2020;12(4):251. <https://doi.org/10.3390/toxins12040251>
- Huang L-L, Huang T-S, Lin Y-H et al. Effects of Upper Trapezius Myofascial Trigger Points on Scapular Kinematics and Muscle Activation in Overhead Athletes. *J Hum Kinet.* 2022;84:32–42. <https://doi.org/10.2478/hukin-2022-000079>
- Jensen C, Finsen L, Hansen K, Christensen H. Upper trapezius muscle activity patterns during repetitive manual material handling and work with a computer mouse. *J Electromyogr Kinesiol.* 1999;9(5):317–25. [https://doi.org/10.1016/S1050-6411\(99\)00007-3](https://doi.org/10.1016/S1050-6411(99)00007-3)
- Jeong SY, Park KY, Seok J et al. Botulinum toxin injection for contouring shoulder. *J Eur Acad Dermatol Venerol.* 2017;31(1):e46–7. <https://doi.org/10.1111/jdv.13705>
- Johnson G, Bogduk N, Nowitzke A, House D. Anatomy and actions of the trapezius muscle. *Clin Biomech* (Bristol). 1994;9(1):44–50. [https://doi.org/10.1016/0268-0033\(94\)90057-4](https://doi.org/10.1016/0268-0033(94)90057-4)
- Park J-Y, Park S, Lee JS, Lee DH. Efficacy and Safety of Incobotulinumtoxin-A for Trapezius Muscle Reduction: Quantitative Evaluation With Imaging Studies. *Plast Reconstr Surg Glob Open.* 2025;13(5):e6782. <https://doi.org/10.1097/GOX.0000000000006782>
- Wang L, Li T, Chi Y et al. Ultrasonographic Analysis of Trapezius Muscle for Efficient Botulinum Toxin Type A Injection. *Aesthetic Plast Surg.* 2023;47(5):2029–36. <https://doi.org/10.1007/s00266-022-03191-0>
- Zhou R-R, Wu H-L, Zhang X-D et al. Efficacy and Safety of Botulinum Toxin Type A Injection in Patients with Bilateral Trapezius Hypertrophy. *Aesthetic Plast Surg.* 2018;42(6):1664–71. <https://doi.org/10.1007/s00266-018-1201-3>