Trigger Point Injections

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Learning Objectives:

1. Define Pain
2. List types of Pain
3. Define trigger point
4. Describe the mechanism of action of trigger point injections
5. Identify appropriate indications for trigger point injections
6. Demonstrate the recommended technique for administering trigger point injections
7. Identify potential complications of trigger point
Resources

Travell & Simons’ Myofascial Pain and Dysfunction: The Trigger Point Manual

VOLUME 1. Upper Half of Body
Second Edition
DAVID G. SIMONS, M.D.
JANET G. TRAVELL, M.D.
LOIS S. SIMONS, P.T.
Illustrations by Barbara D. Cummings

VOLUME 2
Myofascial Pain and Dysfunction: The Trigger Point Manual
THE LOWER EXTREMITIES
JANET G. TRAVELL, M.D.
DAVID G. SIMONS, M.D.
Illustrations by Barbara D. Cummings
What is Pain?

An unpleasant sensory and emotional experience associated with actual or potential tissue damage or describe in terms of such damage.
## Type of Pain

<table>
<thead>
<tr>
<th>Peripheral Nociceptive</th>
<th>Peripheral Neuropathic</th>
<th>Centralized</th>
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<tbody>
<tr>
<td>Inflammation</td>
<td>Damage or Dysfunction</td>
<td>Central disturbance in pain processing</td>
</tr>
<tr>
<td>Mechanical Damage</td>
<td>of Nerves</td>
<td>Processing</td>
</tr>
</tbody>
</table>

[Images of inflammation and nerve damage]
<table>
<thead>
<tr>
<th>Peripheral Nociceptive</th>
<th>Peripheral Neuropathic</th>
<th>Central Neuropathic Or &quot;Centralized&quot; Pain</th>
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</thead>
<tbody>
<tr>
<td>• Inflammation or mechanical damage in tissues</td>
<td>• Damage to or dysfunction of peripheral nerves</td>
<td>• Characterized by central disturbance in pain processing (diffuse hyperalgesia/ allodynia)</td>
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<tr>
<td>• NSAID, opioid responsive</td>
<td>• Responds to both peripherally and centrally acting pharmacologic therapies</td>
<td>• Responsive to neuroactive compounds altering levels of neurotransmitters involved in pain transmission</td>
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<tr>
<td>• Responds to procedures</td>
<td>• Classic examples</td>
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<td>• Classic examples</td>
<td>• Diabetic neuropathic pain</td>
<td>• Fibromyalgia</td>
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<td>• Cancer pain</td>
<td>• Postherpetic neuralgia</td>
<td>• Irritable bowel syndrome</td>
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<td>• Osteoarthritis</td>
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<td>• Tension headache</td>
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<td>• Rheumatoid arthritis</td>
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<td>• TMJD</td>
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</tbody>
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**Figure 1.** Mechanistic characterization of pain.
Myofascial pain

- Typically described as a deep aching sensation, often with a feeling of stiffness in the involved area
- Often results from muscle injury or repetitive strain
- Aggravated by use of the involved muscle(s), psychological stressors, anxiety, cold and postural imbalance
- Radiation from a myofascial trigger point may be described in terms of paresthesiae and thus mimic the symptoms of a cervical or lumbar radiculopathy.
- Muscle weakness secondary to disuse may present with symptoms weakness, poor coordination, reduced work tolerance, fatigue and sleep disturbance.
- Patients with myofascial pain involving the neck and face muscles may experience symptoms of dizziness, tinnitus and poor balance.
Prevalence

- 44 million Americans have myofascial pain problems
- 47% of chronic pain is of musculoskeletal origin
- A study from an internal medicine group practice found that 30% of patients with pain complaints had active myofascial trigger points
- Patients evaluated in one pain management center were found to have a myofascial component to their pain in 95% of cases
What is a Trigger Point?

Trigger points are, focal, hyperirritable spots located in a taut band of skeletal muscle.

Symptoms include local and referred pain and are often accompanied by headache, neck pain, low back pain, and various other musculoskeletal and systemic disorders.
Active vs. Latent

**Active:**
- Causes pain at rest
- Tender to palpation, referred pain pattern that is similar to the patient's pain complaint
- Referred pain is felt not at the site of the trigger point origin, but remote from it

**Latent:**
- Does not cause spontaneous pain, but may restrict movement or cause muscle weakness.
- May become aware of pain originating from a latent trigger point only when pressure is applied directly over the point
Diagnosis of a Trigger Point

- **HPI**
- Palpation of a hypersensitive bundle or nodule of muscle fiber ("knot") of harder than normal consistency.
- Palpation usually elicits pain over the palpated muscle and/or cause radiation of pain towards the zone of reference in addition to a twitch response.
- No laboratory tests or imaging studies (e.g., magnetic resonance imaging [MRI], computed tomography [CT] scan, or x-ray) to diagnose trigger points.
Mechanism of Action

- Mechanical effect of the needle
- Chemical effect of the agents injected, resulting in relaxation and lengthening of the muscle fiber:
  - Injectate may include local vasodilation, dilution, and removal of the accumulated nociceptive substrates.
  - Botulinum toxin A has been used to block acetylcholine release from the motor nerve ending and subsequently relieve the taut band
Indications for Trigger Point Injections

- Myofascial pain, trigger point palpated, twitch response*
- Common sites of pain:
  - Low back pain
  - Neck/shoulder pain
  - Hip pain
  - Pelvic pain
  - Headaches
  - Jaw pain
  - Upper/lower extremity pain
  - Chest and abdominal pain
Contraindications

- Abnormal bleeding tendencies
- Severely compromised immune system (e.g. cancer, HIV, hepatitis, etc.)
- Epilepsy
- Altered psychological status
- Decreased ability to tolerate the procedure (needle phobia)
- Allergy to anesthetic agents
- Acute muscle trauma
Procedure

- Patient position
- Aseptic technique
- Informed consent
- Allay anxiety
- Equipment needed
- Needle selection/injectate
- Trigger point identification
- Administration
Informed Consent
Allay anxiety
Patient Position

Supine

Prone

Sitting
Aseptic Technique
Equipment Needed

- Gloves (sterile)
- Gauze
- Alcohol pads/Chloraprep
- 3-10 mL Syringe
- Injectate
- Needles (size depending on site to be injected)
- Adhesive bandage
- Surgical Marker
Needle Selection

- Needle size depends on the location of the muscle being injected
- Needle should be long enough to reach the contraction knots in the trigger point to disrupt them *
- 22-25 gauge, 1.5-2.5 inch, depending on location of TP and body habitus
  - For thick subcutaneous muscles such as the gluteus maximus or paraspinal muscles in persons who are not obese, a 21-gauge, 2.0-inch needle is usually necessary
  - A 21-gauge, 2.5-inch needle is required to reach the deepest muscles, such as the gluteus minimus and quadratus lumborum, and is available as a hypodermic needle
Injectate

- Injectable solution: 1-2% Lidocaine, 1% procaine, 0.25% bupivacaine
- 1–2 mL per trigger point
- Long-acting nature of agent will prevent the local soreness that some patients experience from the process
- Preliminary evidence shows some efficacy in Botox, expensive
- No evidence to show corticosteroids
Trigger Point Identification
Administration

Isolate trigger point: pinch between the thumb and index finger or between the index and middle finger, whichever is most comfortable.

Insert needle 1 to 2 cm away from the trigger point so that the needle may be advanced into the trigger point at an acute angle of 30 degrees to the skin.

Usually 1 cm into muscle or interspinous ligament The amount of overlying adipose tissue will determine total needle depth; the provider will feel the increase in resistance upon entering the muscle.

Always ensure you are not within a blood vessel, the plunger should be withdrawn before injection
A small amount (0.2 mL) of anesthetic should be injected once the needle is inside the trigger point.

The needle is then withdrawn to the level of the subcutaneous tissue, then redirected superiorly, inferiorly, laterally and medially, repeating the needling and injection process in each direction until the local twitch response is no longer elicited or resisting muscle tautness is no longer perceived “fanning.”
Post Injection

Stretching is an integral part of treatment:
Potential Complications

- Vasovagal syncope
- Pneumothorax
- Hematoma
- Nerve injury
- Seizure
Questions and Demonstration
References


