

# **A COMPARISON OF MYOFASCIAL TRIGGER POINT THERAPIES: A SYSTEMATIC REVIEW**

**Brendyn Kaintz  
MA, ATC, CSCS**

# CONFLICT OF INTEREST

- There is no reported conflict of interest for the research performed or this presentation.

# OUTLINE

- Background
- Objective
- Methods
- Studies
- Data Synthesis
- Conclusions

# BACKGROUND DEFINITIONS

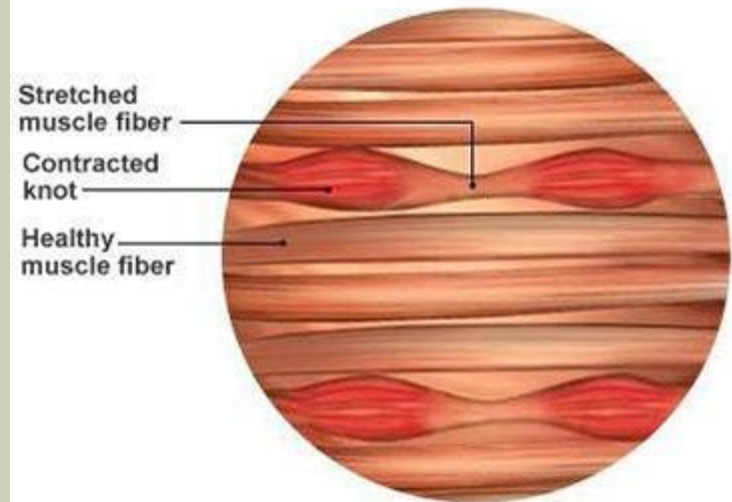
- A trigger point is an area in tissue of hyper-irritability that is very tender when palpated, refers pain and creates a twitch-response when it is palpated (Unalan et al., 2011).
- Location
- A trigger point must have:
  - palpable taut band
  - exquisite tender spot in that taut band,
  - patient recognition of the pain as “familiar”
  - pain should be recognized when stretching the tissues (de las Penas et al., 2005).

# BACKGROUND

## LATENT VERSUS ACTIVE TRIGGER POINTS

- Latent Trigger Points
  - Can be found in patients who do not have pain.
  - Patients often use less analgesic substances for treatment.
  - Patients often have a higher pain threshold.
  - Can change activation patterns of muscles and related functional muscles
  - Can limit ROM (Trampas et al., 2011).

### Muscle Fibers of a Trigger Point Up Close



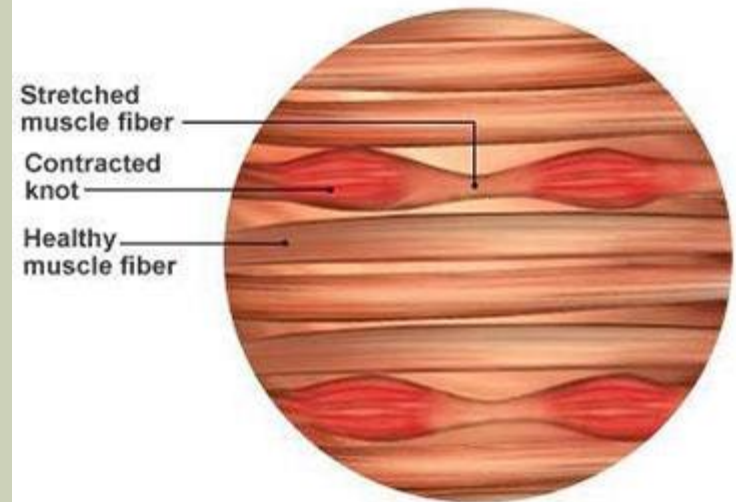
The continuously contracted knot in the muscle fiber stops blood flow at the trigger point starving tissue of oxygen and nutrients. Metabolic waste and toxins build in the area causing pain, tension, and spasm in the muscle.

# BACKGROUND

## LATENT VERSUS ACTIVE TRIGGER POINTS

- Active Trigger Points
  - Patients will experience more pain.
  - Reactive to stretching/compression.
  - Will exhibit familiar pain patterns to the patient.
  - ROM and function of the patient can be limited (Trampas et al., 2011).

### Muscle Fibers of a Trigger Point Up Close



The continuously contracted knot in the muscle fiber stops blood flow at the trigger point starving tissue of oxygen and nutrients. Metabolic waste and toxins build in the area causing pain, tension, and spasm in the muscle.

# BACKGROUND TREATMENTS

- **Modalities**
  - Ultrasound
  - Electrical stimulation
  - Heat/Cold
- **Injections**
  - Botulinum toxin A
  - Bupivacaine/Lidocaine
- **Manual Therapies**
  - Ischemic Compression
  - Muscle Stripping
  - PNF
  - Self-myofascial release
- **Lidocaine Patches**
- **Nerve Root Stimulators**



# OBJECTIVE

- To examine the efficacy of various trigger point treatments and determine which provides the best patient-oriented outcomes.



# METHODS

## LITERATURE SEARCH

- This systematic review was performed utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines
- Search engines:
  - PubMed
  - SPORTDiscus
  - Medline Complete
  - Web of Science.

# METHODS

## SEARCH TERMS

- Search terms for this review included:
  - “Trigger points [Title]”
  - “Trigger point therapies [Title]”,
  - “Trigger point manual therapy [Title]”
  - “Trigger point massage [Title]”
  - “Trigger point AND ultrasound [Title/Abstract]”
  - “Trigger point AND injection [Title/Abstract]”
  - “Trigger point AND manual therapy [Title/Abstract]”

# METHODS

## INCLUSION CRITERIA

- Distinct outcome for use of one of the aforementioned therapies.
- Use of a visual analogue scale (VAS) as well as comparing ROM
- Comparison of a therapy versus another therapy or a control group.
- No restriction
  - Location of trigger points
  - Latent versus active trigger points.
- Peer reviewed journal
  - Preference of a Randomized Controlled Trial (RCT).

# METHODS

## EXCLUSION CRITERIA

- Lack of comparison group or a comparison of treatments.
- Lack of utilization of one of the aforementioned modalities/treatments.

# METHODS

## ASSESSMENT OF RISK OF BIAS

- Articles were graded using the Physiotherapy Evidence Database (PEDro) scale and were preferably used if they rated at a “6” or higher on the scale.
- No restriction on age, race or sex.
- Language not restricted.

# METHODS

## DATA COLLECTION AND SYNTHESIS OF RESULTS

- Studies were categorized by modality:
  - 4 articles chosen per modality
  - Ultrasound Therapy
  - Injection Therapy
  - Manual Therapy
- Title/abstract review was used to determine study inclusion.
- VAS and ROM were compared for each therapy.
- It was determined on an article by article basis if ROM was a significant predictor for return to function.

# METHODS

## QUALITY OF STUDIES SCORES

- The 12 articles compiled had a mean average of  $6.3 \pm 1.3$  on the PEDro scale.
- This score was consistent with the desired average of this systematic review.

# STUDIES

Included Study	Comparisons	Major Results	PEDro
Affaitati et al. 2009	<ol style="list-style-type: none"> <li>1: Lidocaine patch</li> <li>2: Placebo patch</li> <li>3: Injection</li> </ol>	<ul style="list-style-type: none"> <li>• Lidocaine patch/injection &gt; Baseline/placebo: VAS pain, PPT, QOL</li> </ul>	6
Ay et al. 2011	<ol style="list-style-type: none"> <li>1: Phonophoresis</li> <li>2: US</li> <li>3: Placebo US</li> </ol>	<ul style="list-style-type: none"> <li>• Phonophoresis/ultrasound &gt; placebo: VAS pain, cervical ROM, # TPs</li> </ul>	7
Ga et al. 2007	<ol style="list-style-type: none"> <li>1: IM stimulation</li> <li>2: Injection</li> </ol>	<ul style="list-style-type: none"> <li>• IM stim &gt; injection: pain VAS, cervical ROM, depression</li> </ul>	7
Graboski et al. 2005	<ol style="list-style-type: none"> <li>1: Injection (Botulinum Toxin A)</li> <li>2: Injection (bupivacaine)</li> </ol>	<ul style="list-style-type: none"> <li>• Both treatments effective for ↓ VAS pain</li> <li>• No difference in duration/magnitude of relief/function/satisfaction</li> </ul>	5



# STUDIES

Included Study	Comparisons	Major Results	PE德罗
Llamas-Ramos et al. 2014	1: Dry needling 2: Manual therapy	<ul style="list-style-type: none"> <li>• Similar immediate outcomes: neck pain VAS/ROM</li> <li>• Dry needling &gt; MT 2 weeks post</li> </ul>	6
Kim et al. 2013	1: Injection 2: Injection + ischemic compression (30s) 3: Injection + ischemic compression (60s)	<ul style="list-style-type: none"> <li>• Injection + ischemic &gt; injection</li> <li>• No difference b/n 30s and 60 s</li> </ul>	6
Majlesi et al. 2004	1: High-power, pain-threshold US 2: Conventional US	<ul style="list-style-type: none"> <li>• High-power &gt; conventional</li> <li>• Less total tx with high-power</li> </ul>	8
Montanez-Aguilera et al. 2010	1: Ischemic compression	<ul style="list-style-type: none"> <li>• ↑ AROM in neck</li> <li>• ↓ sensitivity of TP according to VAS</li> </ul>	3

# STUDIES

Included Study	Comparisons	Major Results	PE德罗
Renan-Ordine et al. 2011	1: Self stretching 2: Self stretching w/manual therapy	<ul style="list-style-type: none"> <li>Group 2 &gt; Group 1: physical function, SF-36, PPT over calf</li> </ul>	6
Sarrafzadeh et al. 2012	1: Manual therapy 2: Phonophoresis w/hydrocortisone 3: US 4: Control	<ul style="list-style-type: none"> <li>3 tx groups &gt; con: VAS pain, PPT, cervical ROM</li> <li>MT/phonophoresis &gt; US</li> </ul>	7
Trampas et al. 2010	1: PNF stretching 2: Manual therapy + PNF stretching 3: Control	<ul style="list-style-type: none"> <li>MT + PNF &gt; PNF/Control: VAS Pain, knee ROM, PPT</li> </ul>	7
Unalan et al. 2011	1: High-power, pain-threshold US 2: Injection	<ul style="list-style-type: none"> <li>No difference between VAS pain/cervical ROM or length of tx</li> </ul>	7

# DATA SYNTHESIS

- Manual therapy
  - Ischemic compression effective when combined with PNF protocols.
  - Effective with injection therapy
  - Not statistically different from injection therapy or dry needling.
- High-power US to patients' pain threshold and phonophoresis > conventional ultrasound treatment.

# CONCLUSIONS

- Manual therapy, when combined with another modality or therapy, produces superior results.
- High-power US or phonophoresis may result in better outcomes compared to conventional US.
- Length of symptomatic relief from each modality was unclear which warrants further investigation.
- Future research should emphasize a quantitative assessment of pain reduction and range of motion improvement to identify the effectiveness of myofascial TP therapies.

# CONCLUSIONS

## FACTORS TO CONSIDER

- Clinician skill and experience
- Patient experience
- Location of the trigger point
- Age
- Occupation (clinical setting versus athletic population)

# CONCLUSIONS

## TYING IT ALL TOGETHER

- **Moving Forward**
  - Utilizing new treatments on trigger points that have not responded to traditional therapy
    - Manual Therapy versus Injection versus Ultrasound Therapy.
    - Lidocaine Patches versus Nerve Root Stimulators.
- **Research Going Forward**
  - Objective research comparing VAS and ROM changes with statistical analyses.
- **Latent versus Active Trigger Points**
  - Conservative versus Aggressive treatment.
- **Applying treatments in your practice!**

# RESOURCES

- 1. Affaitati G et al. (2009). A Randomized, Controlled Study Comparing a Lidocaine Patch, a Placebo Patch, and Anesthetic Injection for Treatment of Trigger Points in Patients with Myofascial Pain Syndrome: Evaluation of Pain and Somatic Pain Thresholds. *Clin Ther*, 31(4), 707-720.
- 2. Ay S et al. (2011). Comparison the efficacy of phonophoresis and ultrasound therapy in myofascial pain syndrome. *Rheum Int*, 31, 1203-1208.
- 3. de las Penas C et al. (2005). Manual therapies in myofascial trigger point treatment: a systematic review. *J Bodyw Mov Ther*, 9, 27-34.
- 4. Ga H et al. (2007). Intramuscular and nerve root stimulation vs lidocaine injection of trigger points in myofascial pain syndrome. *J Rehab Med*, 39, 374-378.
- 5. Graboski C et al. (2005). Botulinum toxin A versus bupivacaine trigger point injections for the treatment of myofascial pain syndrome: A randomized double blind crossover study. *Pain*, 118, 170-175.
- 6. Kim S. et al. (2013). Ischemic Compression after Trigger Point Injection Affect the Treatment of Myofascial Trigger Points. *Ann Rehab Med*, 37(4), 541-546.
- 7. Llamas-Ramos R et al. (2014). Comparison of the short-term outcomes between trigger point dry needling vs. trigger point manual therapy for the management of chronic mechanical neck pain: A randomized control trial. *J Orthop Phys Ther*, 1-34.
- 8. Majlesi J. and Unalan H. (2004). High-Power Pain Threshold Ultrasound Technique in the Treatment of Active Myofascial Trigger Points: A Randomized, Double-Blind, Case-Control Study. *Arch Phys Med Rehab*, 85, 833-836.
- 9. Montanez-Aguilera F et al. (2010). Changes in a patient with neck pain after application of ischemic compression as a trigger point therapy. *J Back MusculoSkelet*, 23, 101-104.
- 10. Renan-Ordine R et al. (2011). Effectiveness of Myofascial Trigger Point Manual Therapy Combined with a Self-Stretching Protocol for the Management of Plantar Heel Pain: A Randomized Controlled Trial. *J Orthop Phys Ther*, 41(2), 43-50.
- 11. Sarrafzadeh J et al (2012). The Effects of Pressure Release, Phonophoresis of Hydrocortisone and Ultrasound on Upper Trapezius Latent Myofascial Trigger Point. *Arch Phys Med Res*, 93, 72-77.
- 12. Scott N et al. (2009). Trigger Point Injections for Chronic Non-Malignant Musculoskeletal Pain: A Systematic Review. *J Pain Med*, 10(1), 54-69.
- 13. Trampas A et al. (2010). Clinical massage and modified Proprioceptive Neuromuscular Facilitation stretching in males with latent myofascial trigger points. *Phys Ther Sport*, 11, 91-98.
- 14. Unalan H et al. (2011). Comparison of High-Power Pain Threshold Ultrasound Therapy with Local Injection in the Treatment of Active Myofascial Trigger Points of the Upper Trapezius Muscle. *Arch Phys Med Res*, 92, 657-662.

# QUESTIONS