



# **Dry Needling Provided by Physical Therapists for the Management of Musculoskeletal Pain Conditions**

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This is to certify that the thesis entitled *Dry Needling Provided by Physical  
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I hereby certify that this thesis is in the form of a series of papers. I have included as part of the thesis a written declaration from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers. (Appendix A)

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## **Publications and Presentations Included as Part of this Thesis**

The following publications and presentations were a direct result of the work completed in this thesis:

### **Papers Published**

- Gattie E, Cleland J, Snodgrass S. The effectiveness of trigger point dry needling for musculoskeletal conditions by physical therapists: a systematic review and meta-analysis. *Journal of Orthopaedic & Sports Physical Therapy*. 2017;47(3):133-149. doi:10.2519/jospt.2017.7096 (Ranked top 10 most cited publications since 2016 from JOSPT)
- Gattie E, Cleland JA, Snodgrass S. JOSPT perspectives for patients: Trigger point dry needling. *Journal of Orthopaedic & Sports Physical Therapy*. 2017;47(3):150. doi:10.2519/jospt.2017.0502
- Gattie E, Cleland J, Snodgrass S. A survey of American physical therapists' current practice of dry needling: Practice patterns and adverse events. *Musculoskeletal Science and Practice*. December 2020; Volume 50. doi:10.1016/j.msksp.2020.102255
- Gattie E, Cleland J, Snodgrass S. Dry needling for patients with neck pain: protocol of a randomized clinical trial. *JMIR Research Protocols*. 2017;6(11):e227. Published 2017 Nov 22. doi:10.2196/resprot.7980
- Gattie E, Cleland J, Pandya J, Snodgrass S. Dry needling adds no additional benefit to the treatment of neck pain: a sham-controlled randomized clinical trial with 1- year follow-up. *Journal of Orthopaedic & Sports Physical Therapy*. 2021;51(1): 37-45 doi:10.2519/jospt.2021.9864

## **Abstracts Presented at Peer-Reviewed Scientific Conferences**

- Gattie E, Cleland J, Pandya J, Snodgrass S. Short term outcomes of dry needling for patients with mechanical neck pain: randomized clinical trial. American Physical Therapy Association Combined Sections Meeting. Denver, Colorado, USA, February 2020. In *Journal of Orthopaedic & Sports Physical Therapy* 50(1): OPL16.
- Gattie E, Cleland J, Snodgrass S. Systematic Review “The effectiveness of trigger point dry needling for musculoskeletal conditions by Physical Therapists: a systematic review and meta-analysis” *American Academy of Orthopaedic Manual Physical Therapists Annual Conference*, St. Louis, Missouri, October 2016.
- Gattie E, Sabadis S, Snodgrass S, Cleland J. Dry needling in the management of chronic knee pain after total knee arthroplasty: a case report. *American Academy of Orthopaedic and Manual Physical Therapists Annual Conference*, Louisville, Kentucky October 2015.



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## **Abstract**

### **Background**

Dry needling is utilized by a growing number of physical therapists to treat musculoskeletal conditions. However, current evidence for its effectiveness is mixed and lacking long-term outcomes. Little is known about physical therapy practice patterns and safety performing dry needling.

### **Purpose**

To investigate (1) the effectiveness of dry needling as applied by physical therapists (Systematic review), (2) physical therapy clinical practice patterns related to dry needling (Survey), and (3) the long-term effectiveness of dry needling in patients with neck pain when applied using a typical physical therapy clinical approach (Randomized clinical trial).

### **Methods**

A systematic review with meta-analysis determined the effectiveness of dry needling applied by physical therapists for patients with musculoskeletal pain. A survey of physical therapists assessed dry needling practice patterns and adverse events. A sham-controlled randomized clinical trial with 1-year follow-up investigated the effectiveness of dry needling when added to a multi-modal treatment program of manual therapy and exercise for improving pain and disability in patients with mechanical neck pain.

## **Results**

The review of 13 studies (8 meta-analyses) found low to moderate quality evidence for dry needling in the short-term when compared to control/sham/other treatment, but few other long-term effects were reported.

Fifty-five percent of 865 physical therapists surveyed performed dry needling, with practices consistent with expert advice. Minor adverse events were common. Major adverse events were rare, but more common than anticipated (407 occurrences reported by 413 respondents), 8 requiring emergency medical attention.

The randomized clinical trial found no group-by-time interactions at 4-weeks, 6-months or 1-year for any outcomes ( $p > 0.5$ ), indicating the addition of dry needling to an evidence-based treatment had no added benefit. However, both groups demonstrated significant improvement in all outcomes ( $p < 0.5$ ) that was maintained to the 1-year follow up.

## **Conclusions**

The review found low to moderate quality evidence that dry needling is more effective compared to sham, no treatment, and physical therapy treatments in the short/medium-term, but not in the long-term. Physical therapists commonly apply dry needling, consistent with expert opinion, with frequent minor and several major adverse events reported. Adding dry needling to evidence-based care for patients with mechanical neck pain does not improve outcomes. These findings suggest dry needling may benefit some patients with musculoskeletal pain, but does not provide additional benefits beyond current evidence-based care in

patients with neck pain. Potential risks of major adverse events suggest caution when applying dry needling and a need for more standardized training.