



Dry Needling by the Physical Therapist in the Medical Model

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Objectives



1. Identify potential risk associated with dry needling
2. Identify appropriate scenarios in which dry needling might be used by a physical therapist
3. Acknowledge the value of dry needling in the comprehensive management of patients with neuromusculoskeletal diagnoses presenting with pain.

Introduction



Dry Needling (Intramuscular Manual Therapy) is a technique using the insertion of a *solid filament needle, without medication*, into or through the skin to treat various impairments including, but not limited to: scarring, myofascial pain, motor recruitment and muscle firing problems. Goals for treatment vary from *pain relief, increased extensibility of scar tissue* to the *improvement of neuromuscular firing* patterns.



Dry Needling

HISTORY

History



Janet Travell, MD and David Simons, MD

- ▶ Pioneers with trigger point injections using lidocaine and saline
- ▶ Proposed treatments:
 - Manual trigger point release
 - Massage
 - Myofascial release
 - Trigger Point Injections
 - Muscle stretching
 - Reciprocal Inhibition
 - Post-isometric relaxation
 - Spray & stretch
 - Heat
 - US
 - E-stim
 - **Dry Needling**

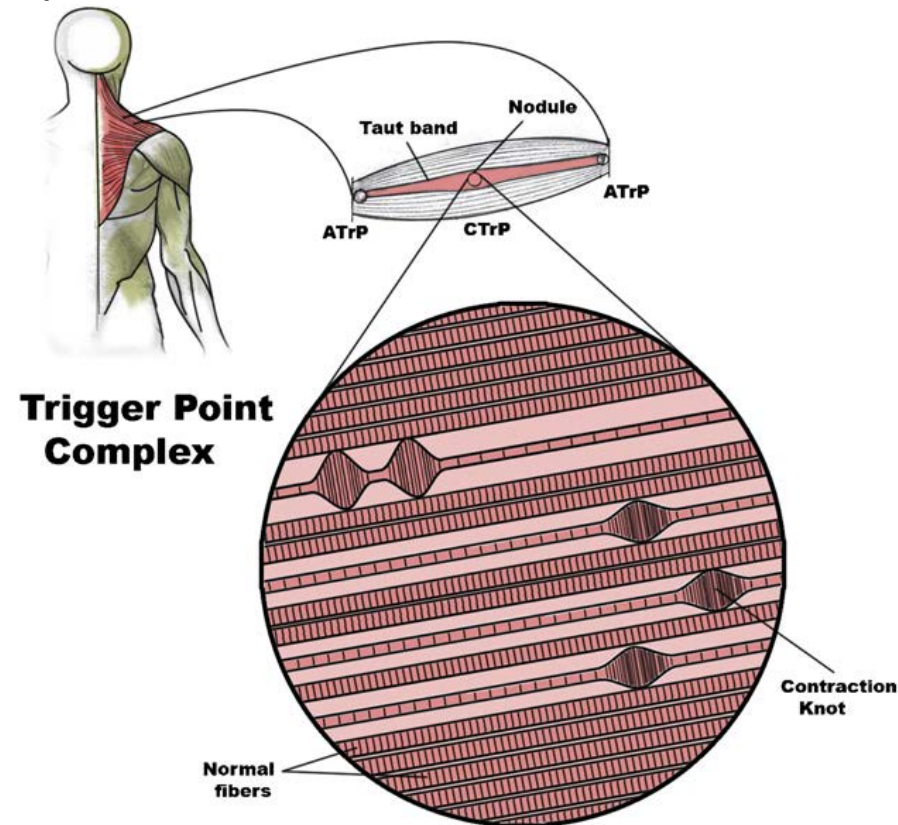
History



Janet Travell, MD and David Simons, MD

- Myofascial Trigger Point (MTrP):

A hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band.



Expert Opinion

Active TrPs

- Reproduction of symptoms
 - Not *only* pain
- Patient recognizes familiar symptoms during palpation
- Symptoms may be absent at rest, but will appear during manual palpation

Latent TrPs

- Do not reproduce symptoms experienced by the patient
- Patient does not recognize symptoms during palpation

****NOTE**** Active TrPs vs. Latent TrPs

- Larger referred pain areas.
- Higher pain intensities
- Overlying cutaneous and subcutaneous tissue more sensitive to pressure and electrical stimulation

History



Janet Travell, MD and David Simons, MD

Local Twitch Response (LTR): Involuntary spinal cord reflex in response to snapping palpation or insertion of needle

- Eliciting a LTR is one of the key aims to deactivate the trigger point
- LTR with needle treatment
 - Confirms accurate location of needle within the myofascial trigger point
 - Superior outcomes when compared to *not* eliciting LTR

Karel Lewitt – The “needle effect”

- 241 patients with myofascial or spinal pain treated with dry needling
 - 86.8% had the needle effect

The “Needle Effect”: “...immediate complete analgesia of the pain spot, without hypesthesia” following needle treatments

History



Karel Lewitt – The “needle effect”

The positive response of patients to various injected substances was due to the mechanical stimulation of the needle more so than what was injected

Janet Travell, MD and David Simons, MD

Maximum therapeutic benefit from either dry needling or trigger point injections was due to mechanical disruption of the trigger point by the needle

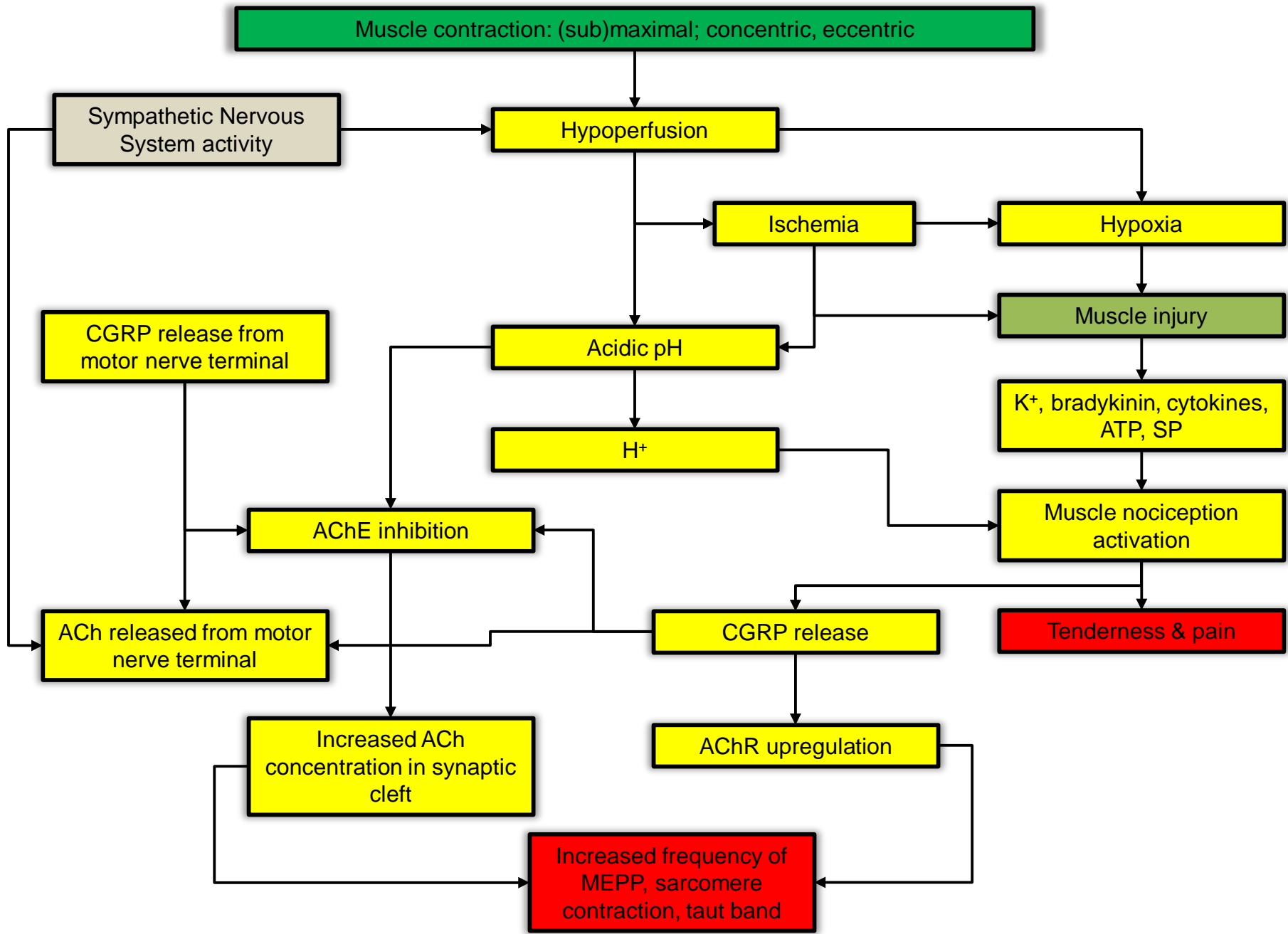
Review

DRY NEEDLING MECHANISMS

The Integrated Hypothesis



- Explanation of how sensitizing neuroreactive chemicals are responsible for pain associated with MTrPs
- Precipitating event:
 - Unaccustomed eccentric exercise; exercise in an unconditioned muscle; prolonged concentric contraction (i.e. postural) – leads to muscle fiber damage
 - Cascade of events resulting pro-inflammatory chemicals and nociceptive sensitivity
 - Self sustaining cycle



Recreated and adapted from: Gerwin RD, Dommerholt J, Shah JP. An Expansion of Simons' Integrated Hypothesis of Trigger Point Formation. *Current Pain and Headache Reports*. 2004(8); 468-475.

Dry Needling Mechanisms



- Insertion of needles into acupoints
- Overlapping activation of multiple cortical and subcortical areas
- PAG
- Stimulation of endogenous anti-nociceptive activity
- Descending pain inhibition

Dry Needling Mechanisms



- LTR = Reduction in proinflammatory and nociceptive chemicals
 - Shah JP, et al. 2005.
 - Shah JP, et al. 2008.
- Anti-nociceptive effects for at least 15 minutes
 - Srbely JZ, et al. 2010.
- Decrease in EPN as measured by EMG
 - Chou LW, et al. 2011.
- Increased perfusion
 - Cagnie B, et al. 2012.
 - Moraska AF, et al. 2013.

Dry Needling Mechanisms



Local

- Decrease inflammatory and nociceptive chemicals
- Improved perfusion
- Decreased elevated EPN
- Improved PPT

Central

- Activation of cortical and subcortical areas
- Stimulation of PAG
- Activation of endogenous anti-nociceptive activity
- Descending pain inhibition
- Improved PPT to distant sites

Literature Review

APPLICATION

Application



- 2016 – Systematic Review
 - Role of the LTR
 - Is it important?



Application



- DN effectiveness by region
 - TMJ:
 - Good reduction in pain but conflicting results for ROM
 - Cervical Spine & Shoulder:
 - Effective for pain reduction and improved ROM
 - Upper Extremity:
 - One study: ECRB
 - Lumbar:
 - One study: Little benefit?
 - Lower Extremity:
 - Insufficient high quality studies to draw firm conclusions

Application



- 2014 - Literature review
- Trigger point dry needling
 - Craniofacial pain and upper quarter pain
 - *Effective short term*
- 2013 – Systematic Review and Meta-analysis
- Trigger point dry needling
 - Recommended for pain reduction *immediately*
 - *Cautiously* recommended for pain reduction at *1 month*

Kietrys DM, et al. Dry Needling for Management of Pain in Upper Quarter and Craniofacial Region. *Curr Pain Headache Rep.* 2014;18:437.

Kietrys DM, et al. Effectiveness of dry needling for upper quarter myofascial pain: a systematic review and meta-analysis. *J Orthop Sports Phys Ther.* 2013;43(9):620-34.

Case Studies



- Thoracic pain
 - 2014, Rock et al. *Int J Sports PT*
- Adhesive capsulitis
 - 2014, Clewey et al. *JOSPT*
- Chronic LBP
 - 2013, Rainey. *Int J Sports PT*
- Hamstring strain
 - 2012, Dembowski et al. *Int J Sports PT*
- Chest wall pain
 - 2012, Westrick et al. *Int J Sports PT*
- **Chronic headache***
 - 2006, Issa et al. *JMMT*

Technique



- Pistoning / Sparrow Pecking
- Twisting
- “Twistoning”
- Leaving in-situ
 - 5-30 minutes

- Elicitation of LTR = more immediate and longer lasting pain relief than no LTR

Technique



- Manipulation of the needle
 - Mechanical coupling of collagen fibers to the needle
 - Direct pull on collagen fibers
 - Improved collage bundle alignment
 - Stimulates cells via mechano-transduction
 - Needle rotation resulted in significantly greater C-fiber activation, distal superficial and deep mechanoreceptors and stretch receptors compared to lifting, thrusting, scraping, shaking and flicking.

Butts R, et al. Peripheral and Spinal Mechanisms of Pain and Dry Needling Mediated Analgesia: A Clinical Resource Guide for Health Care Professionals. *Int J Phys Med Rehabil.* 2016;4(2)

Zhang ZJ, et al. Neural acupuncture unit: a new concept for interpreting effects and mechanisms of acupuncture. *Evid Based Complement Alternat Med.* 2012

Adverse Events

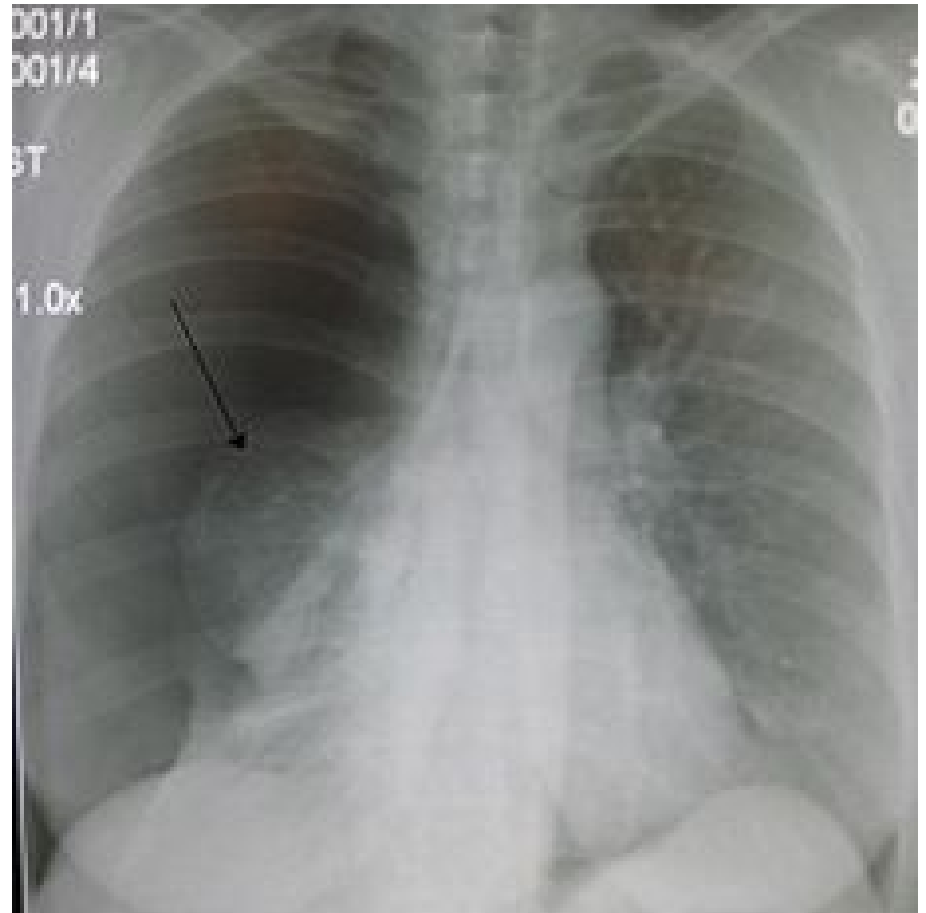


- Significant – None
 - **RISK RATE <0.04%**
- Common – bleeding, bruising, pain
- Uncommon – aggravation of symptoms, drowsiness, headache, nausea
- Rare – fatigue, altered emotions, shaking, itching, claustrophobia, numbness

Adverse Events



- It can even happen to the best and most experienced!



Cummings M, Ross-Marrs, R, Gerwin R.
Pneumothorax complication of deep dry needling
demonstration. *Acupunct Med.* 2014.

Precautions



- Cognitively impaired
- Language barrier
- Skin lesions
- Immunocompromised
- Lymphedema
- Anti-coagulant medication
- Pregnancy
- Implants – Breast, chest, calf, triceps, buttocks, etc.

The American Physical Therapy Association. Description of Dry Needling in Clinical Practice: An Educational Resource Paper. 2013.

McEvoy J. Trigger point dry needling: safety guidelines. In: Dommerholt J, Fernández-de-las-Peñas C, eds. *Trigger Point Dry Needling – An Evidenced and Clinical-Based Approach*. Churchill Livingstone Elsevier. 2013.

Contraindications



- Needle phobia
- Unable to obtain consent
- Patient refusal
- Infection
- ***Post-surgical****



New perspectives on dry needling following a medical model: are we screening our patients sufficiently?

Gary Kearns, César Fernández-De-Las-Peñas, Jean-Michel Brismée, Josué Gan & Jacqueline Doidge

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More thorough screening for medical diagnoses and co-morbidities is needed to reduce adverse events and improve identifying the most appropriate patients

CONCLUSION

Resources



Dry Needling Competencies:

- https://www.fsbpt.org/Portals/0/documents/free-resources/Dry_Needling_Final_Report_Clean.pdf

APTA:

- <http://www.apta.org/StateIssues/DryNeedling/>

Other:

- <http://www.myopainseminars.com/resources/news-rulings.html>

Scope of Practice



- The Federation of State Boards of Physical Therapy
 - www.fsbpt.org/
- Left up to each individual state's licensing body
- Texas – Open practice act and does interpret dry needling within our scope of practice

Interprofessional Collaboration



- Pain management
- Pre-operative care
 - Pre-hab*
- Conservative care for those unable/unwilling to take pain medications
 - Polypharma

* Mayoral O, et al. Efficacy of myofascial trigger point dry needling in the prevention of pain after total knee arthroplasty: a randomized, double-blinded, placebo-controlled trial. *Evid Based Complement Alternat Med.* 2013

Brachioradialis



- Anatomy: Courses from supracondylar ridge of the humerus to the radial styloid
- Innervation: Radial Nerve (C5, 6, 7)
- Action: Elbow flexion
- Potential Pain Referral: Lateral elbow, forearm, wrist and thumb
- Technique: *Position*: Sitting or Supine. Grasp the muscle via pincer palpation and insert the needle towards your fingers
- Needle: 0.25 x 30 mm – 0.30 x 40 mm
- Precautions: Radial Nerve

Brachioradialis



Technique: *Position*: Sitting or Supine. Grasp the muscle via pincer palpation and insert the needle towards your fingers



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