What's the Point?
Dry Needling, Acupuncture, & the Missouri PT Practice Act

Jason E. Bennett, PT, PhD, SCS, ATC
Saint Louis University
Dept. Physical Therapy & Athletic Training

DISCLOSURES
• No financial disclosures
• IOC World Conference for Prevention of Injury and Illness in Sport

The learner will be able to explain the similarities and differences between the application of acupuncture and dry needling

The attendee will understand the physiological and theoretical principles supporting the use of dry needling for the management of neuromusculoskeletal disorders

The attendee will understand the current MO state practice act as it relates to the performance of dry needling

The attendee will understand the practice of dry needling nationally and the position of the APTA and FSBPT regarding the use of dry needling by physical therapists

APTA Dry Needling (DN) Definition
“A skilled intervention performed by a physical therapist that uses a thin filiform needle to penetrate the skin and stimulate underlying myofascial trigger points, muscular and connective tissues for the management of neuromusculoskeletal pain and movement impairments.” (APTA 2012)

Dry Needling Examples

• Brennan KL (2017)
  – Dry Needling vs. Cortisone for GTPS (n=43)
  – Cortisone did not provide greater pain relief or functional improvement than DN
• Lane E (2017)
  – UE Numbness & Tingling Tx w/ DN: Case report
  – 60 y/o F c/o neck pain, R UE Numbness
• Nunez-Cortes, Cruz-Montecinos et al. (2017)
  – DN+PT for Chronic Pain Post-TKA (n=14)
  – Symptoms 6.3 +/- 3.1 mths
  – Significant improvements in:
• Pain
• WOMAC – pain, stiffness, & function
• ROM – flexion & extension
• TUG

• Gattie, Cleland et al. (2017)
  – SR & MA - TDN for Musculoskeletal Conditions by PT
  – DN at least as effective as other treatments
  – Better than sham or no treatment
  – Limited, low-to-moderate quality evidence

11 History of DN

• Karl Lewit, MD (Lewit 1979)
  – First to advocate DDN of TrPs
  – described as ‘the needle effect’
  – stated that the effectiveness of DDN is related to:
    • the intensity of the pain produced at the trigger zone
    • aimed to find the location of maximal tenderness.

12 Travell and Simons (Simons D, J et al. 1999)
  – Three different approaches to the needle-inactivation of TrPs (DN, anesthetic, Botox A)
  – The mechanical disruption and inactivation of the active loci in a TrP without the use
    of anesthetics
  – Stated as effective as local injection of anesthetic for relief of TrP symptoms if LTR
    elicited

13 Acupuncture and Oriental Medicine (AOM)
  • an ancient and empirical system of medicine based on the concept of qi (pronounced
    “chee”)
  • AOM treatments aim to restore energetic balance within a patient through:
    – acupuncture needling
    – Cupping
    – Acupressure
    – tai ji quan and qi gong
    – herbal preparations

14 Main Differences:

1. Education:
   • Comparison of education is the obvious differentiation
2. Application:
   • PTs focus on movement behaviors
   • NOT generally looking to impact systemic disease as direct effect of DN

15 What are the basic entry-level training requirements at AOM programs?
  • A professional acupuncture curriculum must consist of:
– at least 47 semester credits (705 hours) in Oriental medical theory, diagnosis and treatment techniques in acupuncture and related studies
– 22 semester credits (660 hours) in clinical training
– 30 semester credits (450 hours) in biomedical clinical sciences
– 6 semester credits (90 hours) in counseling, communication, ethics, and practice management.

SIMILARITIES

Basic Science Research
• Diagnostic US sonoelastography
  – visualization of TrPs from surrounding tissue
    • (Turo, Otto et al. 2015, Sikdar, Shah et al. 2009)
• MR elastography
  – identify and quantify the myofascial taut band
    • (Chen, Wang et al. 2016)
• Biochemical environment
  – Active TrPs have a distinct biochemical environment associated with pain, inflammation and intercellular signaling
  – Appears to change with the occurrence of a LTR

Basic Science Research
• EMG
  – Latent TrPs demonstrate increased activity at rest and during movement
  – Can alter motor control
    • (Ge, Monterde et al. 2014, Lucas, Rich et al. 2010)

Basic Science Research
• Spontaneous Electrical Activity (SEA) found in TrPs can induce & maintain pain.
  • (Ge, Fernandez-de-Las-Penas et al. 2011)
• DN has been shown to reduce the TrP sensitivity and SEA.
  • (Chen, Chung et al. 2001, Kuan, Hsieh et al. 2007)
• DN of TrPs has been shown to have a segmental anti-nociceptive affect (increase in pain pressure threshold).
  • (Srbely, Dickey et al. 2010)

Conceptual Models
• Trigger Point Model
  – Energy Crisis Theory
  – Motor End Plate Hypothesis
• Radiculopathic Model
  – Intramuscular Stimulation (IMS)

Energy Crisis Theory

Motor End Plate Hypothesis
27 **Trigger Point Model**

- Developed by Travell & Simon’s
  - Continued by Jan Dommerholt, PT and Robert Gerwin, MD
- Treatment focus:
  - elimination of TrPs
  - source of constant peripheral nociceptive input that can contribute to or maintain central sensitization.
    - (Dommerholt 2011)
  - contribution to altered muscle activation and abnormal movement patterns.
    - (Lucas, Rich et al. 2010, Ge, Monterde et al. 2014)

28 **Trigger Point Model**

- Diagnostic Essential Criteria
  - Taut band
  - Exquisite spot tenderness of a nodule
  - Patient’s recognition of current pain complaint by pressure on the tender nodule (identifies active trigger point)
  - Painful limit to full stretch
    - (Dommerholt 2011)
- Emphasizes the importance of eliciting a local twitch response (LTR)
  - important with clinical efficacy
    - (Chu 1997, Chu and Schwartz 2002, Hong 1994)

29 **Trigger Point Model**

- Tx techniques mostly utilize:
  - “pistoning”
  - “sparrow pecking”
  - other variations to elicit the LTR
- Technique stopped when:
  - trigger point stops twitching
  - practitioner feels the optimal result has been achieved
  - patient requests for the practitioner to stop

30 **Radiculopathic Model**

- Dr. Chan Gunn, MD
- Premise: Chronic MFP is the result of peripheral neuropathy or radiculopathy
- Shortening of the multifidi:
  - disc compression
  - narrowed IV foramen
  - direct nerve root pressure
- Muscle shortening, ANS changes and pain are normal occurrences of radiculopathy
  - (Gunn 1997)

32 **Radiculopathic Model**

Treatment Principles
• Necessary to treat the paraspinal muscles segmentally in order to decompress the nerve root
• Needling of shortened paraspinal as well as muscles innervated by the affected myotome
• Described the different sensations that are perceived through the needle
  – A spasm = muscle grasping the needle
  – Fibrotic tissue = grating resistance
  – (Gunn 1997)

**Dry Needling Evidence**

**DN Techniques**

**Pistoning**

• Use of rhythmic and multidirectional passes of the needle into the target tissue
  – Mainly to *elicit a LTR*
  – may result in proliferate response secondary to the micro trauma to the tissue
*Technique typically utilized with the trigger point model*

**Eliciting a Local Twitch Response (LTR)**

• Reaction of the local muscle from the influence of the needle into the loci of tenderness
  – Causes the muscle to twitch
  – most likely associated with the muscle spindle and a reflex arc with the segmental level of innervation of that muscle
  – (Niddam, Chan et al. 2007)

**Pistoning & Eliciting LTR**

**DN Techniques**

**Superficial Dry Needling**

• Developed by Dr. Peter Baldry
• Initially influenced by deep dry needling (DDN) approach advocated by Lewit
• Concern with DDN muscle surrounding safety concerns
  – e.g., DDN the scalene with the concern of the apex of the lung beneath the muscle
• Suggests leaving the needle in the subcutaneous tissues overlying the TrP in the deeper muscle is equally efficacious
  – (Baldry 2002)

**SDN Technique**

• Palpate for location of exquisite tenderness that results in a jump sign or a withdrawal response (Active TrP)
• Insert needle 5-10mm into tissue overlying the TrP
• Leave in place for 30 sec.
• Remove the needle and re-palpate
• If initial response not abolished, insert for another 2-3 min.
  – May need to intermittently twirl the needle
• **SDN Efficacy** - one clinical trial found on PubMed
  – SDN followed by active stretching is more effective than stretching alone in deactivating TrPs (reducing their sensitivity to pressure)
  – more effective than no treatment in reducing subjective pain
  – (Edwards and Knowles 2003)
• Superficial dry needling is preferred over deep dry needling
  – DDN will be used when there is apparent nerve root or peripheral nerve compression
• The emphasis on SDN is to reduce or eliminate post treatment soreness
  – (Baldry 2002)

**DDN**

**Dry Needling with Electrical Stimulation Proposed Response**

• Low intensity, low frequency electrical stimulation induces:
  – *central pain modulation by activation of the peri-aqueductal grey (PAG)*

• Main findings:
  1. Intervention modulated PAG activity to painful stimuli more in responders than in non-responders
  2. Change in PAG activity from the whole patient population correlated with change in pressure pain threshold
  3. A network known to regulate affective qualities of the pain experience was (subsignificantly) engaged more in responders than in non-responders.

• Most likely involves supraspinal pain control mechanisms related to both anti-nociception and regulation of pain
  – (Niddam, Chan et al. 2007)

• No evidence-based clinical guidelines of optimal tx parameters
  – Frequency, type, duration, amplitude

• Frequencies
  – 2-4 Hz thought to trigger the release of endorphins and enkephalins
  – 80-100 Hz may release gammaaminobutyric acid (GABA), galanin and dynorphin

• Little evidence to support the ideal needle placement
  – In the skin within a specific dermatomal level
  – In and around a TrP
  – In the taut band
  – At the location of an elicited LTR
  – (Dommerholt and Fernandez-de-las Penas 2013)

• Electrical Stimulation + DN
  – Yet to be researched for efficacy; mostly case reports and case series

• Examples of e-stim protocols:
  – Unilateral segmental stimulation
  – Bilateral segmental stimulation
  – Myotomal stimulation (could consider dermatomal if staying superficial)
  – Spinal segmental/myotomal circuit

**DN with ES - Vastus Intermedius**

**IMS with Electrical Stimulation**

**Why E-stim?**
• Electroacupuncture studies have provided mixed results

• Yet

• Electrical stimulation + DN has become more popular secondary to:
  – Ease of eliciting multiple twitch responses
  – Decreasing soreness from other techniques
  • (Rock and Rainey 2014, Krey, Borchers et al. 2015)

Other DN Techniques

• Neurofunctional
  • Perineural
  • Tendon or Ligament
  • Twisting, Rotating, Pulling

Neurofunctional
• a relatively new concept
• focus is on how the nervous system drives function and dysfunctional movement and behavioral patterns resulting in specific diagnoses
• very similar to the trigger point method
• technique will likely not use pistoning
  – incorporates leaving the needles indwelling/in situ for periods of time
  – may include electric stimulation for sensory or motor response

Perineural
• All types of needling; always affecting the nervous system with DN
  • (Baldry 2002)

Tendon/Ligament
• SR supported use of dry needling of tendinous structures
  – subjective VAS in two studies
  – Victorian Institute of Assessment-Achilles
  – improvement in subjective pain and shoulder disability index in another
  • (Krey, Borchers et al. 2015)

Dry Needling Technique Variations

Dry Needling Theory

Dry Needling Application Principles

Adverse Events
• Brady et al
  – Reported adverse events associated with 19.18% of dry needling cases
- mild AE’s
  - (Brady, McEvoy et al. 2014)
- Witt et al
  - 229,230 patients; 2.2 million sessions
  - Self-report
    - 8.6% at least one AE
    - 2.2% required further tx
  - Most common AE = bleeding and pain
    - (Witt, Pach et al. 2009)

Whether dry needle or EMG needle, two key concerns:
1. Vasovagal response
2. Pneumothorax
   - Two cases (Witt, Pach et al. 2009)
   - Miller (1990)
   - Honet (1988)

Vasovagal Response
- Triggers - any painful response, such as a needle
- Common in young adults
- Pathophysiology
  - Heart rate slows
  - Blood pressure drops
- Confusion
- Fainting

APTA

PHYSICAL THERAPY PROFESSIONAL ORGANIZATIONS’ POSITIONS ON DRY NEEDLING
- APTA recognizes dry needling as being part of the physical therapist professional scope of practice. APTA Board Directors Guideline BOD G02-14-18-12 titled Guidelines: Physical Therapist Scope of Practice lists dry needling as 1 of the interventions provided by physical therapists:
  - Physical therapy, which is limited to the care and services provided by or under the direction and supervision of a physical therapist, includes:
  - (2) alleviating impairment and functional limitation by designing, implementing, and modifying therapeutic interventions that
  - include, but are not limited to:
    - Dry needling

Federation of State Boards of Physical Therapy
- “Dry needling is a skilled technique performed by a physical therapist using filiform needles to penetrate the skin and/or underlying tissues to affect change in body structures and functions for the evaluation and management of neuromusculoskeletal conditions, pain, movement impairments, and disability.”
Henry et al vs. NC Acupuncture

• On January 30, 2017, the United States District Court for the Middle District of North Carolina issued its Opinion and Order in the case of Henry et al. v. the North Carolina Acupuncture Licensing Board et al.

• Henry et al. v. the North Carolina Acupuncture Licensing Board et al, is an antitrust lawsuit arguing that the North Carolina Acupuncture Licensing Board (NCALB) is violating antitrust law and due process rights in its actions to prevent PTs from practicing the skilled intervention of dry needling.

• The court ruled “that Plaintiffs have satisfied their obligation, at this stage, to plausibly allege an impact on interstate commerce.”

• As far as we know, this is the first Federal ruling in favor of dry needling by physical therapists in the United States, which could have far-reaching implications for acupuncturists in other states who are still attempting to stop the practice of dry needling by physical therapists.

• http://myopainseminars.com/resourcesnews-rulings/

Recognized by 35 State Licensing Boards
- 7 No opinion
- 6 Not allowed
- 2 In review
- http://myopainseminars.com/resourcesnews-rulings/

MO Practice Act

334.500
- “Practice of physical therapy”
- the examination, treatment and instruction of human beings to assess, prevent, correct, alleviate and limit physical disability, movement dysfunction, bodily malfunction and pain from injury, disease and any other bodily condition
- the planning, administration, evaluation and modification of treatment and instruction, including the use of physical measures, activities and devices, for preventive and therapeutic purposes

MO Practice Act

• Physical therapists may perform electromyography and nerve conduction tests but may not interpret the results of the electromyography or nerve conduction test.

• Physical therapists shall practice physical therapy within the scope of their education and training as provided in sections 334.500 to 334.620.

QUESTIONS?

• Resource Paper: Description of Dry Needling in Clinical Practice. 2012 [cited 2017 March];

