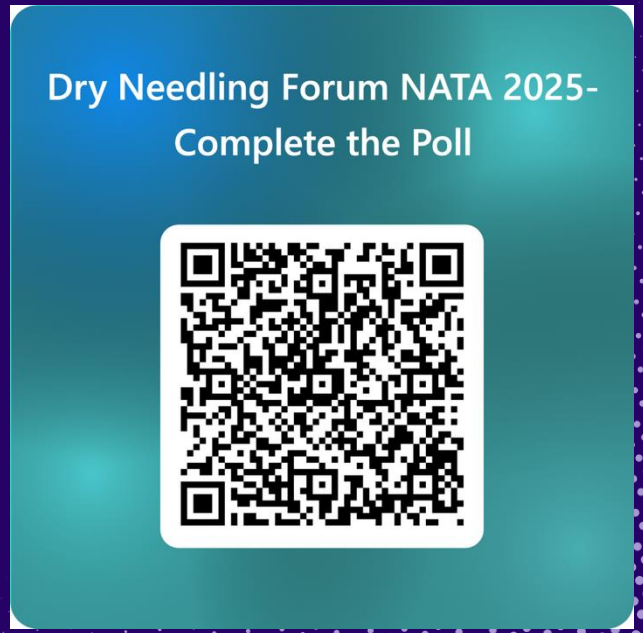
Dry Needling for Soft Tissue Injury Management: Current Issues and Concerns

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President and Founder, Structure & Function Education
Associate Professor, Athletic Training, A.T. Still University
Senior Advisor, LA Dodgers

Brian V. Hortz, PhD, ATC
Director of Research and Education, Structure & Function Education
Adjunct Professor, Athletic Training, A.T. Still University



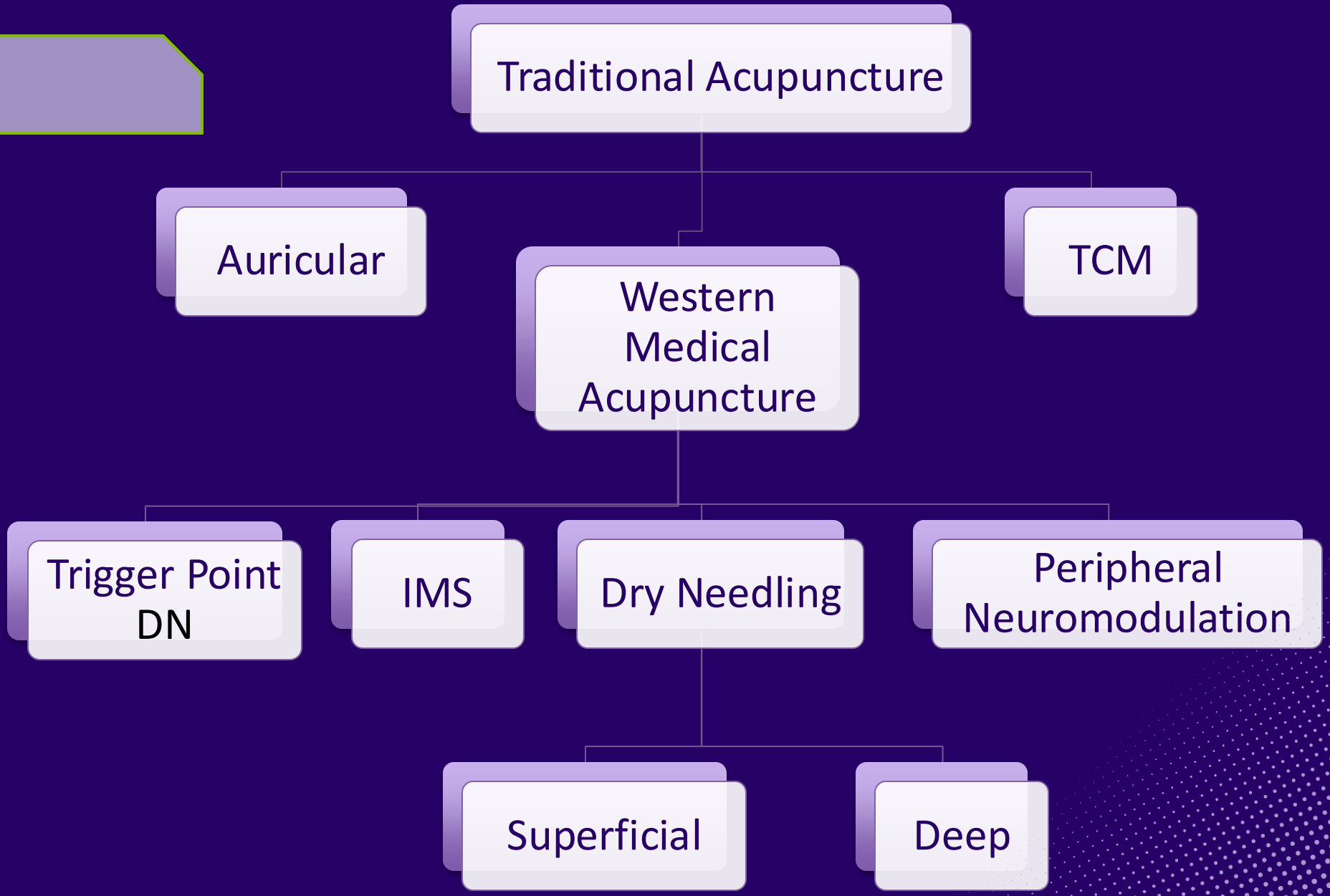
Relationship Disclosure

- *Sue Falsone:*
  - *I have relevant financial relationships and arrangements with:*
    - Structure & Function Education, PLLC
      - President and Founder
      - In-person and online education
    - On Target Publications
      - Products: Book, DVDs, Audio lectures
- Brian Hortz
    - Structure & Function Education, PLLC
      - Director of Research and Education
      - In-person and online education

What is Dry Needling?

- A skilled intervention 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

McAphee D, Bagwell M, Falsone S. Dry Needling: A Clinical Commentary. Int J Sports Phys Ther. 2022 Jun 1;17(4):551-555. doi: 10.26603/001c.35693. PMID: 35693854; PMCID: PMC9159711.
Dommerholt, Jan, César Fernández-de-las-Peñas, and Shannon Mbravo Petersen. “Needling: Is There a Point?” *The Journal of Manual & Manipulative Therapy* 27, no. 3 (July 2019): 125–27. https://doi.org/10.1080/10669817.2019.1620049.


Traditional Acupuncture
Auricular
Western Medical Acupuncture
TCM
Trigger Point DN
IMS
Dry Needling
Peripheral Neuromodulation
Superficial
Deep

Tools in the Tool Box

- No one discipline owns a specific technique
  - Homeopathic and Naturopathic Physicians, Nutritonists and Acupuncturists all prescribe herbs
  - Athletic Trainers, Physical Therapists, Chiropractors, and Osteopaths all perform manipulation
  - Athletic Trainers, Physical Therapists, and Chiropractors all use tape, exercise and physical agent modalities
  - Everyone uses AEDs

APTA Resource paper: PT & The Performance of Dry Needling, Accessed July 18,2018

The Dry Needling Issue, Dommerholt, 2008

Indications and Common Uses

- Typical injuries and conditions
  - Muscle pain
  - Myofascial pain syndromes
  - Tendinopathies
  - Other sports injuries
- Benefits observed
  - Pain reduction
  - Increased range of motion
  - Shortened recovery time

Current State of Dry Needling

- States vary in their regulation of dry needling
  - But AT use is increasing over time
- Evolution of dry needling in musculoskeletal management
  - Its expansion into athletic training
- This use has led to questions
  - The efficacy of DN
  - How dry needling fits into a comprehensive injury treatment plan
  - How it fits with multimodal approaches with other modalities (e.g., manual therapy, strengthening)

Efficacy and Evidence Base

- Evidence is consistent, but more research is needed.
  - RCT models/ issues
  - EBP models/ issues

Q&A

- This is a discussion. What would you like to explore?
  - What do our polls say?

EDUCATION AND LEGISLATION

Dry Needling Adoption & Integration

- States have varied stances on dry needling for athletic trainers
  - Explicit Laws & Rules
  - View it as “Under the Direction of Physician” or however their law is written. “Silent/Grey States”
  - Prohibited as part of their practice due to how licensure law is written
  - Remember the purpose of Boards!

Legislative/Practice issues

- Licensure issues
  - Board and legislative stances vary by state
    - Functions of Boards
  - Educational preparation and safety

Does Athletic Training Education Prepare AT's for Dry Needling?

- **To some**
- **FSBPT-** ical Therapi
  - Outlin
  - An ex y needling tasks as defined by the
  - Result pecific and these tion. Howe ducation.

Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association

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Article 5

March 2019

Current Athletic Training Educational Preparation for Dry Needling

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Hortz, Brian V.; Falsone, Sue; and Tulimieri, Duncan (2019) "Current Athletic Training Educational Preparation for Dry Needling," Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association: Vol. 4: Iss. 3, Article 5.
DOI: https://doi.org/10.25035/jsmahs.04.03.05 Available at: https://scholarworks.bgsu.edu/jsmahs/vol4/iss3/5


QUESTIONS

DOES DN REALLY HAVE AN IMPACT ON PAIN AND FUNCTION?

Does DN Work For Musculoskeletal Pain?

- 36 systematic reviews were included in this review.
- DN has a short-term analgesic effect in all body regions and may be of additional value to the interventions currently used in clinical practice.
- Results on physical functioning outcomes were contradictory across body regions.
- Compared to these interventions in isolation, combining DN with physiotherapeutic interventions appears to have an additional treatment effect.



Journal of *Clinical Medicine*

MDPI

Systematic Review

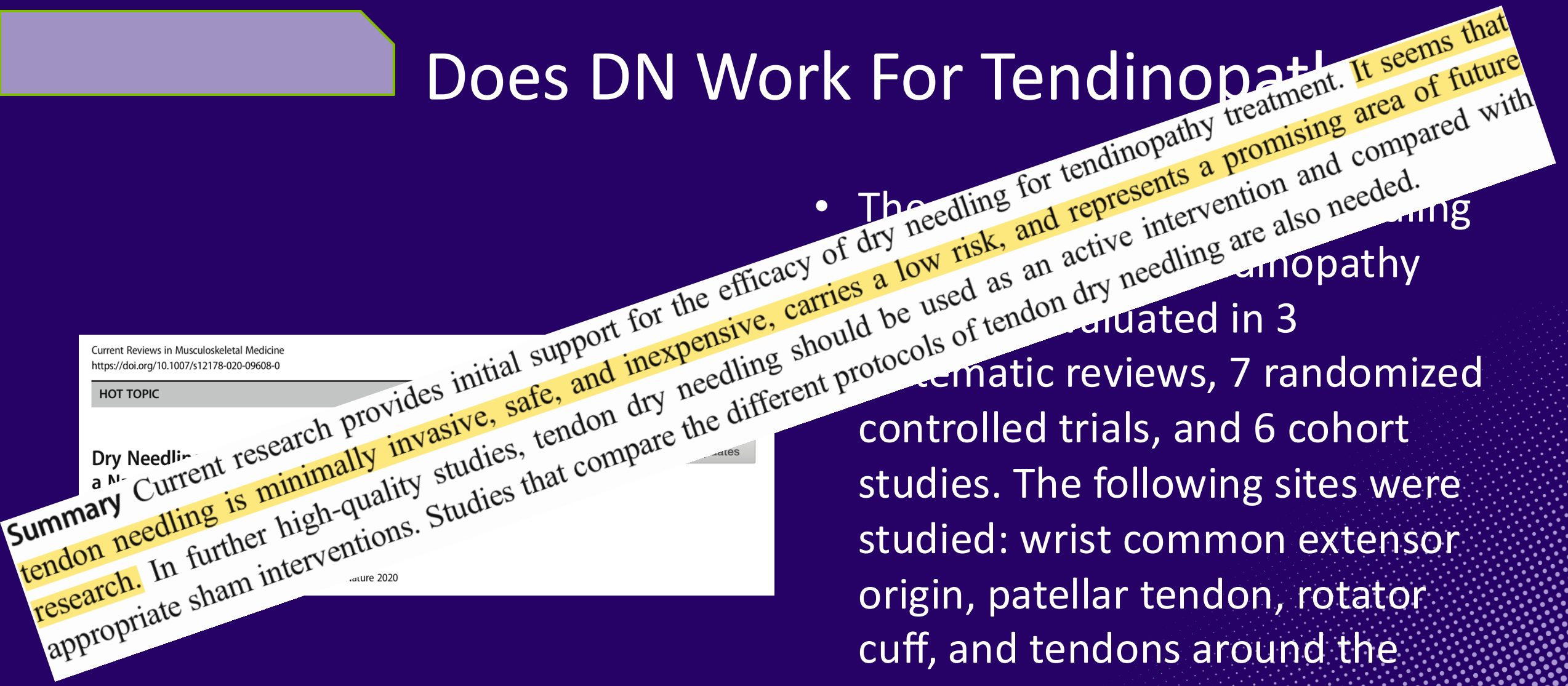
Clinical Effectiveness of Dry Needling in Patients with Musculoskeletal Pain—An Umbrella Review

Marjolein Chys [1,*], Kayleigh De Meulemeester [1], Indra De Greef [1], Carlos Murillo [1,2], Wouter Kindt [1], Yassir Kouzouz [1], Bavo Lescroart [1] and Barbara Cagnie [1]

[1] Department of Rehabilitation Sciences, Ghent University, 9000 Ghent, Belgium
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* Correspondence: marjolein.chys@ugent.be

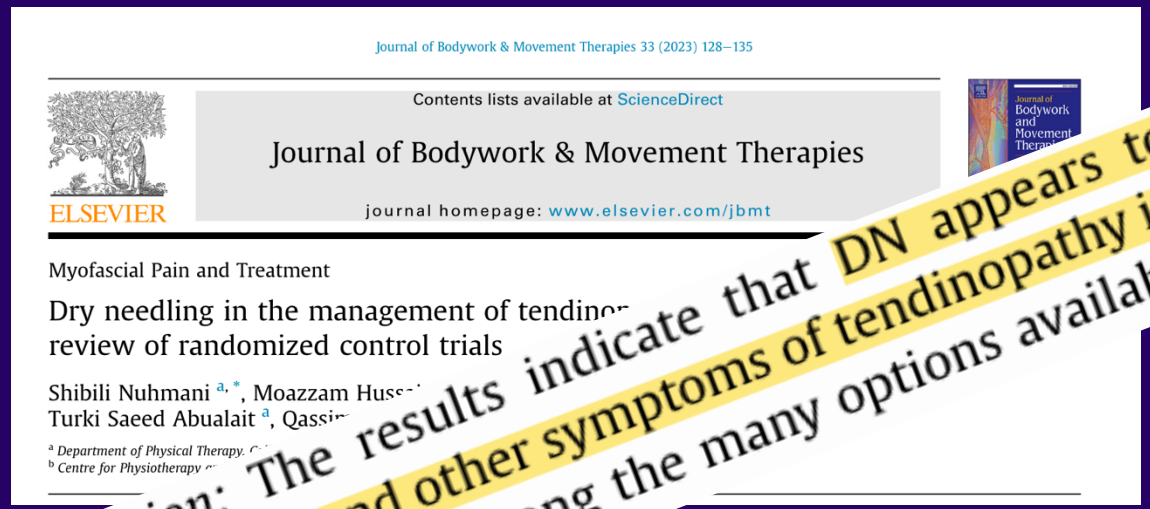
Chys, M.; De Meulemeester, K.; De Greef, I.; Murillo, C.; Kindt, W.; Kouzouz, Y.; Lescroart, B.; Cagnie, B. Clinical Effectiveness of Dry Needling in Patients with Musculoskeletal Pain—An Umbrella Review. J. Clin. Med. 2023, 12, 1205. https://doi.org/10.3390/jcm12031205

Does DN Work For Tendinopath



- The ling
  inopathy
  uated in 3
  matic reviews, 7 randomized controlled trials, and 6 cohort studies. The following sites were studied: wrist common extensor origin, patellar tendon, rotator cuff, and tendons around the greater trochanter.

Does DN Work For Tendinopathy?



Journal of Bodywork & Movement Therapies 33 (2023) 128–135

Contents lists available at ScienceDirect

Journal of Bodywork & Movement Therapies

journal homepage: www.elsevier.com/jbmt

ELSEVIER

Myofascial Pain and Treatment

Dry needling in the management of tendino
review of randomized control trials

Shibili Nuhmani [a, *], Moazzam Huss
Turki Saeed Abualait [a], Qassi

[a] Department of Physical Therapy.
[b] Centre for Physiotherapy

Conclusion: The results indicate that DN appears to be as effective as other treatment methods at relieving pain and other symptoms of tendinopathy immediately after treatment and up to 6 months. DN can be considered among the many options available for the management of tendinopathy.

- A total of 357 participants
the seven included st
greater troch
epicond
an
lateral
tendinopathy
with various
ns, including platelet-rich
a injection, autologous blood
injection, and non-steroidal anti-inflammatory medication.
- All the selected studies reported a significant positive effect of DN on pain intensity and other outcome measures.


QUESTIONS

THE USE OF E-STIM AND NEEDLES

Indications:
Why should we use it?

1. Turn something on
   - Muscle Activation
2. Turn something off
   - Muscle Fatigue
3. Scar
   - Mechanotransduction
4. Pain

What Hz Do We Use?

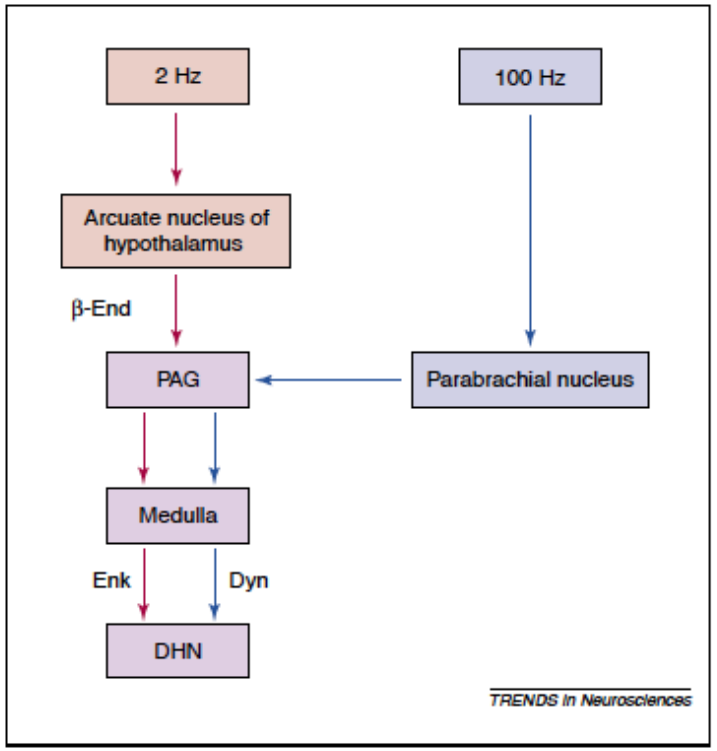


Fig. 2. Neural pathways mediating the analgesic effect elicited by low-frequency (2 Hz, red) or high-frequency (100 Hz, blue) electroacupuncture stimulation. Abbreviations: DHN, dorsal horn neuron of the spinal cord; Dyn, Dynorphin A; β-End, β-endorphin; Enk, enkephalin; PAG, periaqueductal grey matter. Modified, with permission, from Ref. [23].

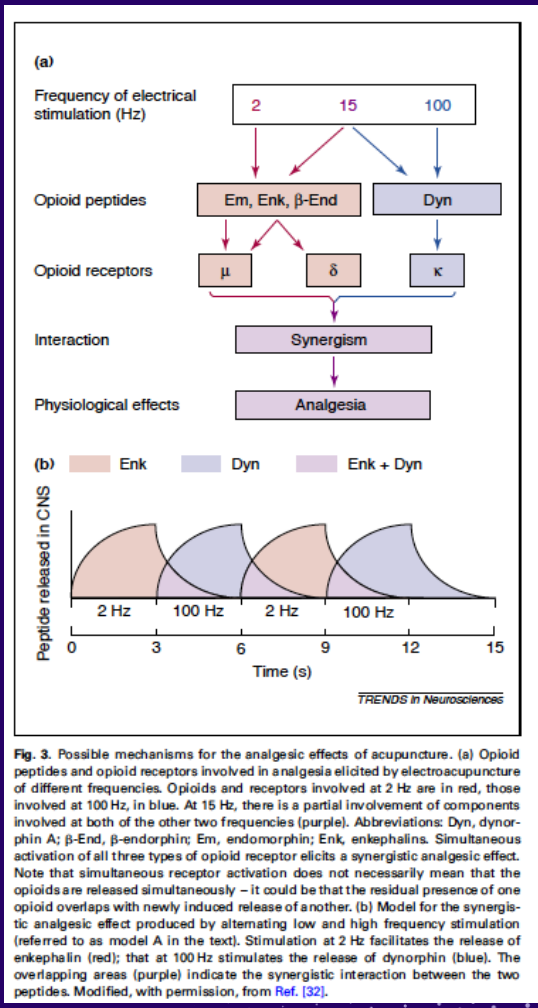


Fig. 3. Possible mechanisms for the analgesic effects of acupuncture. (a) Opioid peptides and opioid receptors involved in analgesia elicited by electroacupuncture of different frequencies. Opioids and receptors involved at 2 Hz are in red, those involved at 100 Hz, in blue. At 15 Hz, there is a partial involvement of components involved at both of the other two frequencies (purple). Abbreviations: Dyn, dynorphin A; β-End, β-endorphin; Em, endomorphin; Enk, enkephalins. Simultaneous activation of all three types of opioid receptor elicits a synergistic analgesic effect. Note that simultaneous receptor activation does not necessarily mean that the opioids are released simultaneously – it could be that the residual presence of one opioid overlaps with newly induced release of another. (b) Model for the synergistic analgesic effect produced by alternating low and high frequency stimulation (referred to as model A in the text). Stimulation at 2 Hz facilitates the release of enkephalin (red); that at 100 Hz stimulates the release of dynorphin (blue). The overlapping areas (purple) indicate the synergistic interaction between the two peptides. Modified, with permission, from Ref. [32].

Han, 2004


QUESTIONS

PHYSIOLOGY

How Does It Work?

- Dry needling stimulates the body's natural healing process.
  - Local Effects
  - Segmental Effects
  - Systemic Effects



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Cho ZH, Hwang SC, Wong EK, et al. Neural substrates, experimental evidences and functional hypothesis of acupuncture mechanisms. *Acta Neurologica Scandinavica*. 2006;113(6):370-377. doi:10.1111/j.1600-0404.2006.00600.x

Local Physiological Effects

- Overall:
  - Needle insertion stimulates A Beta, A Delta and C Fibers
  - Creates a local inflammatory response
  - Brings satellite cells to the area
    - Differentiate themselves to replace lesioned tissues
- Local effects happen almost immediately

Basbaum et al, 2009 *Physiological Effects of Dry Needling, Cagnie, 2013*

Dry Needling for Manual Therapists, Gyer, 2016

Segmental Effects

- Segmental
  - Afferent stimulus activates the body's descending control mechanisms.
  - Causing the release of:
    - Opioids (Beta-endorphin, Met-Enkephalin, Endomorphin, Dynorphin)
      - These are presynaptic inhibitors
    - Monoamines (Noradrenaline, Norepinephrine, Serotonin)
      - These are postsynaptic inhibitors

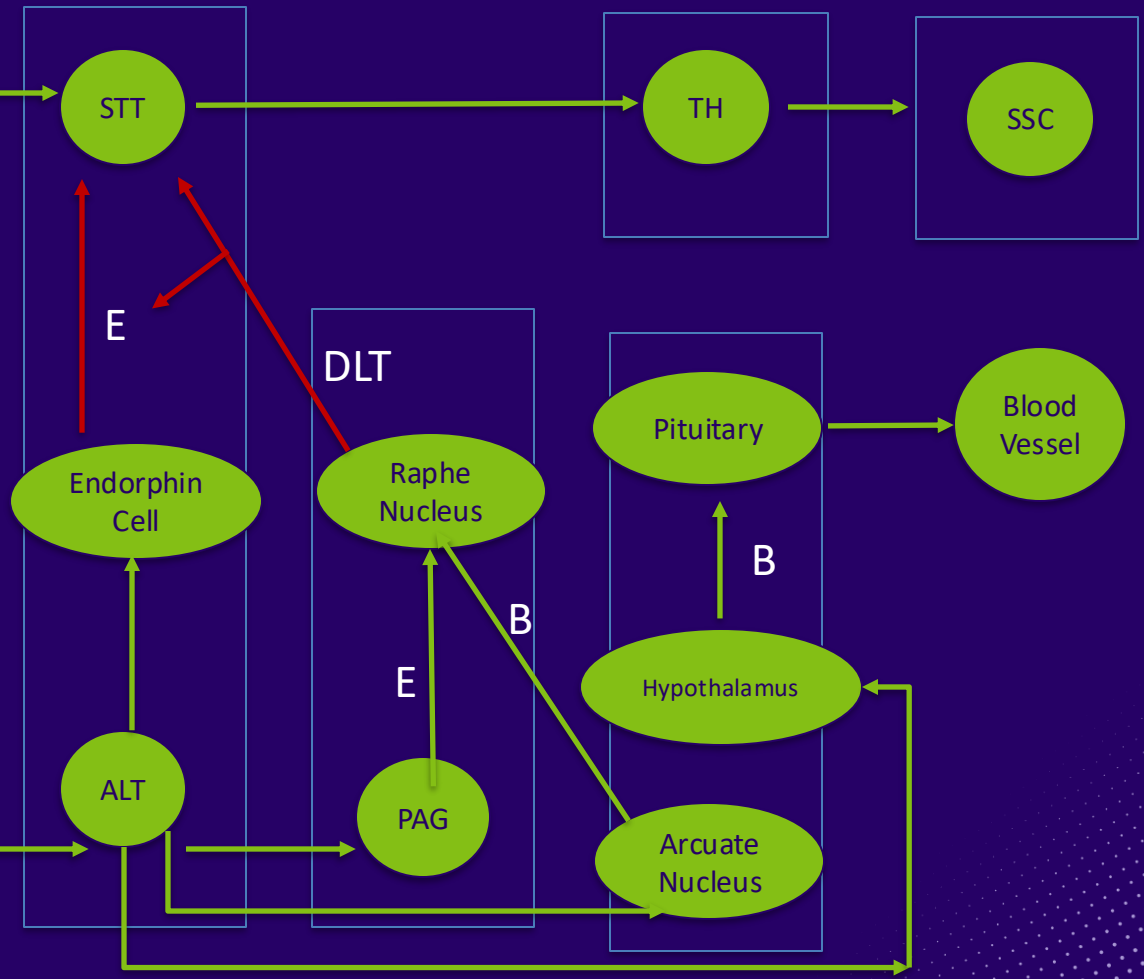
Butts et al., 2017
Millan, 2002

Systemic Effects

- Stimulates the HPA axis (Hypothalamus-Pituitary-Adrenal Axis)
  - Regulates the body's inflammatory processes







E = Met-Enkephlin or Dynorphin **M** = Monoamines (Seratonin, Norepinephrine, Noradrenaline) **B** = Beta Endorphin

Pre-synaptic Inhibition Post-synaptic Inhibition

ACTH = Adrenocorticotropic Hormone


QUESTIONS

CONTRAINDICATIONS AND PRECAUTIONS

Contraindications

- Metal allergy
- Skin lesions/ rashes/ spray tan/ make up
  - Need clean, intact skin
- Blood and systemic diseases, including but not limited to:
  - Leukemia and lymphoma
  - Severe aplastic anemia
- True needle phobia
- Cancerous tissue
- True lymphedema
- Specific to the LB
  - Moderate scoliosis
  - Spina bifida
  - Laminectomy/ Laminotomy (true precaution)
- Transplant patients
  - Immune issues
- Implants
  - Breast, calf, glute, etc
- Patients with cognitive impairment or are not communicative

Contraindications

- Patients with known compromised immune systems (true precaution- more education needed)
  - HIV/ AIDS/ Hepatitis B and C
  - Any viral infection including general sickness
  - If *you* have a known BBP you should not dry needle your patients until consulting with an infectious disease control professional
- Pregnancy (true precaution- more education needed)
  - If SFDN1 is the only DN class you take, then pregnancy is a contraindication
- Valve related heart disease/Even when repaired
  - Even replacement valves generate abnormalities in flow which are associated with an increased risk of endocarditis from significant bacteraemia


QUESTIONS

PATIENT EDUCATION AND ADVERSE REACTIONS

Dry Needling Specific Reviews

- Dry Needling literature
  - 223 physical therapists, 20,493 treatments over 6 weeks
    - 7,531 minor adverse events, 36.7% of total treatments resulted in a minor AE

Table 2. *Minor Adverse Events Reported with Dry Needling (20,494 treatments).*

Event	Number Reported	Percentage per Total Treatments
Bleeding	3288	16.04%
Bruising	1581	7.71%
Pain During	1216	5.93%
Pain After	558	2.72%
Aggravated Symptoms	312	1.52%
Drowsiness	190	0.93%
Feeling Faint	159	0.78%
Headache	133	0.65%
Nausea	94	0.46%

Boyce et al, 2020

Dry Needling Specific Reviews

- Twenty major AE's were reported out of the 20,494 treatments for a rate of <0.1%, which equates to roughly 1 per 1024 treatments

Table 3. *Major Adverse Events Reported with Dry Needling (20,494 treatments).*

Event	Number Reported	Percentage per Total Treatments
Prolonged Symptom Aggravation	6	.03%
Fainting	4	.02%
Forgotten Needles	3	.01%
Flu Like Symptoms	2	.009%
Infection	2	.009%
Excessive Bleeding	1	.004%
Lower Limb Weakness	1	.004%
Numbness	1	.004%
Total Major Adverse Events	20	.1%

Boyce et al, 2020

Informed Consent

- Hall DE, Prochazka A V, Fink AS. *Informed consent for clinical treatment.* CMAJ . 2012; 184(5): 533-540.

  “(1) develop a practice of involving patients in decisions

  (2) explicitly establish the goals of care, and prioritize them in the context of the patient’s other life goals

  (3) recognize that the informed consent process serves more than one purpose (legal, ethical, administrative, and the development of patient trust)

  (4) document the process thoroughly, using an electronic medical record whenever possible to ensure permanence”

Musculoskeletal Science and Practice 66 (2023) 102778

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Musculoskeletal Science and Practice

journal homepage: www.elsevier.com/locate/msksp

Original article

Creation of a risk of harms informed consent form for dry needling: A nominal group technique

Edmund C. Ickert [a,*], David Griswold [b], Ken Learman [b], Chad Cook [c]

[a] Department of Physical Therapy, Youngstown State University, 1 University Plaza, Youngstown, OH, 44555, USA
[b] Youngstown State University, USA
[c] Duke University, USA

Adverse Event	Likelihood	Additional Information
Serious Risks (may require hospitalization)		
Collapsed Lung (Pneumothorax)	Rare	Symptoms may include shortness of breath or chest pain that can last for many days to weeks. A more severe lung puncture can require a visit to the hospital.
Fainting (Syncope)	Rare	Symptoms leading to fainting may include lightheaded, dizzy, or sweating. Let your healthcare provider know if you have any of these symptoms while being treated. People usually recover quickly but a medical exam may be needed if problems occur.
Significant Risks (May continue for days/weeks and can require medical care)		
Bleeding under skin resulting in a bump (Hematoma)	Uncommon	May result in a bruise.
Nerve Injury	Uncommon	May cause temporary numbness, tingling, weakness, or sensation changes. Needles are small, flexible, and do not have a cutting edge. Significant tissue trauma is unlikely.
Skin Irritation	Rare	Local redness, small bumps, and itching that may last a few hours.
Mild Risks (May cause temporary symptoms and little inconvenience)		
Bleeding (Droplet)	Common	Droplet is cleaned by healthcare provider, but it may result in a bruise.
Bruising	Common	May last a few days
Sweating (Diaphoresis)	Common	Usually occurs during or after treatment and may last minutes to a few hours
Dizziness	Common	
Fatigue	Common	
Drowsiness	Uncommon	
Temporary Symptom Increase	Common	Usually occurs during or after treatment and may last a few hours up to a few days.
Pain During/After	Common	
Soreness	Uncommon	

Fig. 1. Dry needling risk of harm statement.

Ickert et al. 2023


QUESTIONS

STAY IN TOUCH!

VISIT
STRUCTUREANDFUNCTION.NET
TO LEARN MORE ABOUT OUR DRY NEEDLING COURSES, MANUAL THERAPY COURSES, AND ONLINE EDUCATION PLATFORM

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