

FOOT & ANKLE

SPECIAL INTEREST GROUP

Dry Needling for Plantar Pain: A Ten Year Follow-up

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As President of the Foot and Ankle SIG and a member of the New York State Board for Physical Therapy, answering questions about the current state practice of physical therapy (in New York and elsewhere) is a frequent activity. Questions regarding the use of dry needling (DN), by physical therapists for the treatment of orthopaedic conditions, often present as: “Is dry needling effective?” and “Can physical therapists perform it?” Now, I am not an authority on DN, but I can review current literature and pass along the state of the practice regarding DN. The following is what I learned.

Because FASIG members are interested, the intent of this column is to review the current and potential use of DN for plantar foot pain, including plantar heel pain and plantar fasciitis. This very publication is devoted to idea/treatment information sharing. So, why not encourage some of the most talented foot and ankle specialists to re-visit this area and perhaps kindle discussion, and even more importantly, spur research? In fact, this column celebrates the 10-year anniversary of a very similar column written by Jan Dommerholt, PT, MS, titled “Dry Needling in Orthopaedic Physical Therapy Practice.”¹ Since this publication, significant progress has transpired; more therapists have been trained in DN. Some physical therapists are trained at the university level (4 entry-level programs now teach DN), and more states specifically allow DN (4 in 2004: Maryland, New Mexico, New Hampshire, and Virginia; 26 in 2014).² Unfortunately, some of the same issues that hinder our progress in providing DN to our patients remain. In particular defining what DN is (a manual skill) and what it is not (acupuncture).

Confusion surrounding the research and applications of DN runs counter-productive to our collective use of this skilled intervention. Research has shown that DN can be effective in reducing pain and short-term disability.³⁻⁵ Dry needling deserves further exploration as a treatment for orthopaedic conditions, particularly with regard to the establishment of optimal protocols across different diagnoses. Orthopaedic physical therapists should closely critique the literature on DN for safety, efficacy for pain relief, and for the practical application patient care because the definitions of the various uses of DN are often misinterpreted.

Precisely What is Dry Needling?

Dry needling is the insertion of thin monofilament needles into and/or around muscles, tendons, ligaments, fascia, peripheral nerves, scar tissue, Ah-Shi (painful) points, and neurovascular bundles with the purpose of treating a number of neuromusculoskeletal syndromes. Wet needling, in contrast, uses hollow-bore needles to deliver agents, including corticosteroids, anesthetics, sclerosants, and botulinum toxins.

Precisely What is the Target of the Needle?

The target tissue specifically defines the purpose of DN performed:

Ah-Shi (painful) points: The practice of acupuncture targets the monofilament needle at body locations established by traditional Chinese/Oriental practice. The word “acupuncture” translates to “needle penetration” and “Ah-Shi” translates to “where it hurts,” which is the foundation of acupuncture needle placement.

Trigger points: The insertion of a monofilament needle into nodules within taught bands of muscle is a DN technique used in the treatment of myofascial pain. The literature abbreviates this type of DN as myofascial trigger point (MTrP) treatment, as needles are targeted to trigger points (TrPs).

Neuromusculoskeletal tissues: The insertion of a monofilament needle into and/or around muscles, ligaments, tendons, fascia, peripheral nerves, scar tissue, and neurovascular bundles. Research continues to investigate various applications of DN. These areas include the biomechanical, chemical, endocrinological, vascular effects of DN, and also treatment of tendonopathies. Furthermore local, proximal, and distal needling (regional interdependence), and the addition of manual manipulation or electrical stimulation to DN, are also under investigation.

Is Dry Needling Safe?

Dry needling while invasive, is safe. The insertion of a monofilament needle presents little risk to patients, provided the administrator of the treatment has sound anatomical knowledge.⁶

Interestingly, the discomfort that may be encountered during DN is considered an adverse event and as Cotchett et al⁷ estimated, one in 3 patients have an adverse event. However, Yamashita et al,⁸ in a study of 65,482 patients, found that no patients had a serious or severe adverse event such as pneumothorax, infection, or spinal cord injury and that minor adverse events occurred in only .04% of the cases. These adverse events were defined as failure to remove needles, ecchymosis or hematoma without pain, ecchymosis or hematoma with pain, burn injury, discomfort, dizziness, nausea or vomiting, pain in the punctured region, minor hemorrhage, aggravation of complaint, malaise, suspected contact dermatitis, fever, and numbness in the upper extremity. Directly from the CDC website the adverse effects of getting a flu vaccination include “soreness, redness, or swelling where the shot was given, fainting (mainly adolescents), headache, muscle aches, fever, and nausea. If these problems occur, they usually begin soon after the shot and last 1 to 2 days,” and these adverse effects are similar to those of DN. When comparing side effects of DN and influenza vaccinations, DN is as safe as getting a yearly vaccine for the flu.

Further validating the safety of DN, a 2012 review of the CNA insurance claims database revealed no significant claims were reported involving physical therapists performing DN and that the practice of DN by a physical therapist does not present

a significant risk factor. Presently, CNA does not foresee the administration of DN by a licensed physical therapist as having any immediate claim or rate impact.⁹

Is Dry Needling the Same as Acupuncture?

The actual procedure of inserting fine monofilament needles in acupuncture and DN is identical; however, acupuncture terminology, theoretical constructs, and philosophies are different than those of DN. Acupuncture theory claims to move qi along meridians or channels particularly with diagnoses such as bi syndrome, qi, blood (yin) stagnation, and kidney (yang) deficiency. These are terms, diagnoses, and theories not used in the context of western medicine's definition of DN and use of monofilament needles. Interestingly, acupuncture studies often use western medical diagnoses such as chronic neck pain, plantar fasciitis, knee osteoarthritis, and carpal tunnel syndrome as validation to insert needles into Ah-Shi points. Differentiating DN from acupuncture by physical therapists is not new. In fact, Dommerholt discussed the obvious similarities and differences 10 years ago.¹

Obviously, DN involves the use of needles inserted into and removed from the human body; however, that is the only similarity between DN and acupuncture. Similarly, if a hammer is associated with carpenters, do plumbers become carpenters every time they use a hammer? The objective of DN is not to control and regulate the flow and balance of energy and is not based on Eastern esoteric and metaphysical concepts. The fact that needles are being used in the practice of DN does not imply that an acupuncture board would automatically have jurisdiction over such practice. If so, physicians and nurses would also need to conform to the statutes of acupuncture, as they also "insert and remove needles."

Can Physical Therapists Legally Perform Dry Needling?

Yes. Physical therapists must be trained appropriately and the practice act of the state in which they practice must allow DN. Presently, 26 states (or jurisdictions), according to their practice acts, specifically allow DN by physical therapists. Two more states do not prohibit DN and 5 more leave it unresolved. A full 20 more states have no position or prohibit DN. The primary issues related to practice act or regulatory change include the perceived overlay of acupuncture and the insertion of a needle to penetrate the skin.²

Made available from the Federation of State Boards of Physical Therapy, a 2013 Resource Paper by the World Health Organization (WHO) published a number of reports on acupuncture. Specifically, the report discussing traditional medicine refers to DN in acupuncture, but in context, the reference is comparing needling alone with needling in conjunction with complements such as laser, TENS, and electro-acupuncture. The WHO report does not describe DN in the same context as intramuscular manual therapy or trigger point DN. Many of the WHO's reports regarding acupuncture including "Acupuncture: Review and Analysis of Reports on Controlled Clinical Trials," do not contain the term dry needling at all. According to WHO, dry needling is not acupuncture.

Are There Recommended Protocols and Dosages?

Optimal dosage (frequency of treatment), intensity (number of needles used and amount of manual manipulation or electrical stimulation), and duration (length of time needles are left in situ) have yet to be fully investigated. It seems clear that the duration of needle retention, meaning the amount of time the needle is left in situ, is important to effectiveness. It is also clear that continued research on all the variables related to needling, including, but not limited to, entry point of needle, angulation of needle, depth of needle, numbers and combinations of needles, and manipulation and electrical stimulation of needles, must be done.

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If One Wants to Dry Needle a Trigger Point, Can One Find the Correct Spot?

Maybe. Inter-examiner reliability for the palpation and location of trigger points is poor. If clinicians are not consistently and correctly determining TrP locations, then clinicians cannot consistently or reliably penetrate the nodules within the taut bands of an active TrP. Further, if researchers cannot reliably detect, isolate, and dry needle TrPs, then studies that claim to measure the effects of DN at TrPs are questionable.¹⁰ So far, the evidence suggests that TrPs cannot be reliably found, or needled.¹¹ Results of studies that attempt to determine the efficacy of DN TrPs should be viewed with extreme caution.¹²

What Research Exists Regarding Dry Needling for Plantar Fasciitis?

Typical of most research regarding DN techniques, DN is performed with or without acupuncture principles, with or without TrP principles, and often in comparison to wet needling; discerning the impact of DN alone is impossible. As an example of the inconsistencies in research regarding DN, a recent trial by Cotchett et al,⁷ suggested that DN "provided significant reductions in plantar heel pain," but the level of minimally important difference was insufficient. The goal of the study was to use DN, but to do so (1) at palpated TrPs and (2) with needles left in situ for 5 minutes. (Note: this article has been cited as having needle treatment for 30 minutes, but the actual protocol called for 5 minutes needle placement duration over multiple sites.)

1. Multiple studies report that the reliability of an examiner accurately and consistently locating and needling TrPs is poor.
2. No previous case study, cohort study, or randomized trial limited needle duration dosage to 5 minutes.

To date, limited evidence exists for the effectiveness of DN associated with plantar heel pain. Research that could include greater clarity and control of variables and which might include principles of highly effective DN at the knee and for carpal tunnel syndrome has not occurred for the past 10 years begs the question...where is the research regarding plantar heel pain and dry needling?

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