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Dry Needling in Orthopaedic Physical Therapy Practice

Jan Dommerholt, PT, MPS

NOTE: Consistent with ethical guidelines, the author wishes to disclose that he is co-founder and co-program director of the Janet G. Travell, MD Seminar SeriesSM, the only US-based continuing education program that offers courses for physical therapists in the technique of dry needling. Readers, check with your own state practice acts on the use of this technique.

INTRODUCTION

Orthopaedic physical therapists employ a wide range of intervention strategies to reduce patients' pain and improve function. From time to time, new treatment approaches are being introduced to the field of physical therapy. The arrival of manual therapy in the United States is a good example. Although for several decades, manual physical therapy was already an essential part of the scope of orthopaedic physical therapy practice in Europe, New Zealand, and Australia, manual therapy did not make its debut in the United States until the 1960s.¹ Initially many US state boards of physical therapy opposed the use of manual therapy. In spite of the early resistance, manual physical therapy has become a mainstream treatment approach. Manual therapy techniques are now taught in academic programs and continuing education courses. During the past few years, physical therapists, the APTA, and the AAOMPT even have had to defend the right to practice manual therapy especially when challenged by the chiropractic community! A similar development is in progress with the relatively new technique of dry needling. While some physical therapy state boards have already decided that dry needling falls within the scope of physical therapy practice, others are still more hesitant. The goal of this paper is to introduce the American orthopaedic physical therapy community to the technique of dry needling.

DRY NEEDLING

Dry needling is commonly used by physical therapists around the world. For example, in Canada, many provinces allow physical therapists to use dry needling techniques. In Spain, several universities

offer academic programs that include dry needling courses. The University of Castilla-La Mancha offers a postgraduate degree in conservative and invasive physical therapy. At the University of Valencia, dry needling is included in the curriculum of the master's degree program in manipulative physical therapy. In Switzerland, dry needling courses are offered via the accredited continuing education program of the 'Interessengemeinschaft für Manuelle Triggerpunkt Therapie' (Society for Manual Trigger Point Therapy). Physical therapists in the UK are increasingly being trained in joint injection techniques.²

In the United States, dry needling is not included in physical therapy educational curricula and relatively few physical therapists employ the technique. Dry needling is erroneously assumed to fall under the scopes of medical practice or oriental medicine and acupuncture. However, physical therapy state boards of Maryland, New Hampshire, New Mexico, and Virginia have already ruled that dry needling does fall within the scope of physical therapy in those states. The Tennessee Board of Occupational and Physical Therapy recently rejected dry needling by physical therapists. The general counsel of the Illinois Department of Regulation advised that dry needling would not fall within the scope of practice of physical therapy but should be covered by the board of acupuncture. In the mean time, physical therapists who are adequately trained in the technique of dry needling are successfully employing the technique with a wide variety of patients.

DRY NEEDLING TECHNIQUES

Several dry needling approaches have been developed based on different individual theories, insights, and hypotheses. The 3 main schools of dry needling are presented: the myofascial trigger point model, the radiculopathy model, and the spinal segmental sensitization model.

Myofascial Trigger Point Model

Dry needling is used primarily in the treatment of myofascial trigger points (MTrPs), defined as "hyperirritable spots in skeletal muscle associated with hypersensitive palpable nodules in a taut band."³ The

MTrPs are the hallmark characteristic of myofascial pain syndrome (MPS). A recent survey of physician members of the American Pain Society showed general agreement that MPS is a distinct syndrome.⁴ Throughout the history of manual physical therapy, MPS and MTrPs have received little or no attention, although several studies have demonstrated that MTrPs are commonly seen in acute and chronic pain conditions, and in nearly all orthopaedic conditions.⁵ Vecchiet and colleagues demonstrated that acute pain following exercise or sports participation is often due to acutely painful MTrPs. Myofascial trigger points are often responsible for complaints of pain in persons with hip osteoarthritis,⁶ pain with cervical disc lesions,⁷ pain with TMD,⁸ pelvic pain,⁹ headaches,¹⁰ epicondylitis,¹¹ etc. Hendler and Kozikowski concluded that MPS is the most commonly missed diagnoses in chronic pain patients.¹² A brief review of the current knowledge of MTrPs and MPS is indicated to better understand the place of dry needling within orthopaedic physical therapy.

Already during the early 1940s, Dr. Janet Travell (1901-1997) realized the importance of MPS and MTrPs. Recent insights in the nature, etiology, and neurophysiology of MTrPs and their associated symptoms have propelled the interest in the diagnosis and treatment of persons with MPS worldwide. The mechanism that underlies the development of MTrPs is not known, but altered activity of the motor end plate, or neuromuscular junction, is most likely. Changes in acetylcholine receptor (AChR) activity, in the number of receptors, and changes in acetylcholinesterase (AChE) activity are consistent with known mechanisms of end plate function, and could explain the changes in end plate activity that occur in the MTrP. There is a marked increase in the frequency of miniature end plate potential activity at the point of maximum tenderness in the taut band in the human, and in the neuromuscular junction end plate zone of the taut band in the rabbit model and in humans.

Normally, ACh is broken down by AChE. Preliminary results of studies by Shah and associates at the National Institutes of Health indicate that a number

of biochemical alterations are commonly found at the active MTrP site using microdialysis sampling techniques.¹³ Among the changes found are elevated bradykinin, substance P, and calcitonin gene-related peptide (CGRP) levels, and lowered pH when compared to inactive (asymptomatic) MTrPs and to normal controls.¹³ The combination of increased levels of CGRP and lowered pH suggest that the milieu of a MTrP is too acidic for AChE to function efficiently. The possible implications for the development of MTrPs is outside the scope of this article and will be addressed in a future article.¹⁴ The administration of botulinum toxin can block the release of ACh, and is therefore now widely used in the management of chronic and persistent MPS.

Abnormal end plate noise (EPN) associated with MTrPs can be visualized with electromyography using a monopolar teflon-coated needle electrode and a slow insertion technique.^{15,16} Active MTrPs are spontaneously painful, refer pain to more distant locations, and cause muscle weakness, mechanical range of motion restrictions, and several autonomic phenomena. One of the unique features of MTrPs is the phenomenon of the local twitch response (LTR), which is an involuntary spinal cord reflex contraction of the contracted muscle fibers in a taut band following palpation or needling of the band or trigger point.¹⁷ The LTR can be visualized with needle electromyography and ultrasonography.^{18,19}

To make a diagnosis of MPS, the minimum essential features that need to be present are the taut band, an exquisitely tender spot in the taut band, and the patient's recognition of the pain complaint by pressure on the tender nodule.²⁰ Simons, Travell, and Simons add a painful limit to stretch range of motion as the fourth essential criterion.³ Referred pain, the LTR, and the electromyographic demonstration of end plate noise are confirmatory observations and not essential for the clinical diagnosis.

From a biomechanical perspective, National Institutes of Health researchers Wang and Yu hypothesized that MTrPs are severely contracted sarcomeres whereby myosin filaments literally get stuck in titin gel at the Z-band of the sarcomere (Figures 1 and 2).²¹ Titin is the largest known protein that connects the Z-band with myosin filaments within a sarcomere. Approximately 90% of titin consists of 244 repeating copies of fibronectin

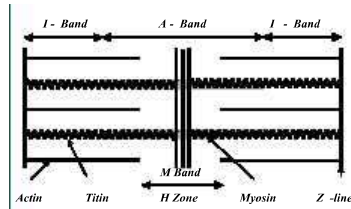


Figure 1. Schematic representation of a normal sarcomere.

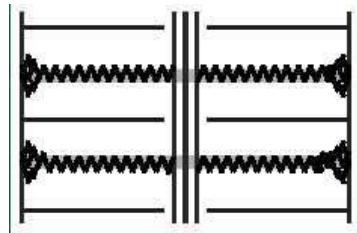


Figure 2. Schematic representation of a MTrP with myosin filaments literally stuck in titin gel at the Z-line (after Wang K, Yu L. Emerging Concepts of Muscle Contraction and Clinical Implications for Myofascial Pain Syndrome. Presented at Focus on Pain 2000, Mesa, AZ: Janet G. Travell, MD Seminar Series²¹.)

type III and immunoglobulin domains, which may contribute to the sticky nature of titin once muscle fibers are contracted.

Histological studies have confirmed the presence of extreme sarcomere contractions, resulting in localized tissue hypoxia.²² Brücke and colleagues established that the local oxygen saturation at a MTrP site is less than 5% of normal.²³ Hypoxia leads to the release of local release of several nociceptive chemicals, including bradykinin, CGRP, and substance P, among others, which have been detected in abnormal high concentrations at MTrPs.¹³ Bradykinin is a nociceptive agent that stimulates the release of tumor necrosis factor and interleukins, some of which in turn can stimulate the further release of bradykinin. Calcitonin gene-related peptide modulates synaptic transmission at the neuromuscular junction by inhibiting the expression of AChE, which is another likely mechanism that contributes to the excessively high concentration of ACh.

Split fibers, ragged red fibers, type II fiber atrophy, and fibers with a moth-eaten appearance have been detected in MTrPs.²⁷ Ragged red fibers and moth-

eaten fibers are also associated with muscle ischemia and represent an accumulation of mitochondria or a change in the distribution of mitochondria or the sarco-tubular system respectively.

Combining these various lines of research, it can be concluded that MTrPs function as peripheral nociceptors that can initiate, accentuate, and maintain the process of central sensitization.²⁴ As a source of peripheral nociceptive input, MTrPs are capable of unmasking sleeping receptors in the dorsal horn, resulting in spatial summation and the appearance of new receptive fields, which clinically are identified as areas of referred pain. The MTrPs are commonly associated with other pain states and diagnoses, including complex regional pain syndrome, and should be considered in the clinical management.²⁵ Treatment of MTrPs is only one of the components of the therapeutic program, and does not replace other therapeutic measures, such as joint mobilizations, posture training, strengthening, etc. As MTrPs are easily accessible to trained hands, inactivating MTrPs is one of the most effective and fastest means to reduce pain. Dry needling is the most precise method currently available to physical therapists.

Myofascial trigger points can be identified by palpation only. There are no other diagnostic tests that can accurately identify an MTrP, although new methodologies using piezoelectric shockwave emitters are being explored.²⁶ Excellent inter-rater reliability has been established.^{20,27} Simons, Travell, and Simons describe 2 palpation techniques for the proper identification of MTrPs. A flat palpation technique is used for example with palpation of the infraspinatus, the masseter, temporalis, and lower trapezius. A pincher palpation technique is used for example with palpation of the sternocleidomastoid, the upper trapezius, and the gastrocnemius.

Trigger point dry needling

Janet Travell pioneered the use of MTrP injections that eventually led to the development of dry needling. Her first paper describing MTrP injection techniques was published in 1942, followed by many others. Together with Dr. David Simons she wrote the 2-volume Trigger Point Manual.¹³⁸ Many studies have confirmed the benefits of trigger point injections even though a recent review article could not demonstrate clinical efficacy

beyond placebo.⁵²⁹ In 1979 Lewit confirmed that the effects of needling were primarily due to mechanical stimulation of a MTrP with the needle.³⁰ Dry needling of a MTrP using an acupuncture needle caused immediate analgesia in nearly 87% of needle sites. In over 31% of cases, the analgesia was permanent. Twenty percent had several months of pain relief, 22% several weeks, and 11% several days. Fourteen percent had no relief at all.³⁰

Dry needling an MTrP is most effective, when local twitch responses (LTR) are elicited.³¹ A LTR has been shown to inhibit abnormal end plate noise. Current (unpublished) research strongly suggests that a LTR is essential in altering the chemical milieu of an MTrP (Shah, 2004, personal communication). Patients commonly describe an immediate reduction or elimination of the pain complaint after eliciting LTRs. Once the pain is reduced, patients can start active stretching, strengthening, and stabilization programs. Eliciting a LTR with dry needling is usually a rather painful procedure. Post-needling soreness may last for 1 to 2 days, but can easily be distinguished from the original pain complaint. Patients with chronic pain frequently report to have received previous trigger point injections; however, many state that they never experienced LTRs. Accurate needling requires clinical familiarity with MTrPs and excellent palpation skills.

Dr. Peter Baldry has adopted the Travell and Simons trigger point model, but prefers a gentler and less mechanistic approach to needling MTrPs when possible. According to Baldry, using a superficial needling technique is nearly always effective. With superficial dry needling, the needle is placed in the skin and cutaneous tissues overlying an MTrP. Baldry agrees that both superficial and deep dry needling have their place in the management of MTrPs.³² A recent study confirmed that both superficial and deep dry needling are effective with dry needling having a stronger and more immediate effect.³³

Radiculopathy Model

In Canada, Dr. Chan Gunn developed his 'radiculopathy model' and coined the term 'intramuscular stimulation' instead of dry needling.³⁴ Gunn has expressed the belief that myofascial pain is always secondary to peripheral neuropathy or radiculopathy and therefore, myofascial pain would always be a reflection of neuropathic pain

in the musculoskeletal system. Because of muscle shortening, which in this model is always due to neuropathy, 'supersensitive nociceptors' may be compressed, leading to pain. The radiculopathy model is based on Cannon and Rosenblueth's "Law of Denervation." According to this law, the function and integrity of innervated structures is dependent upon the free flow of nerve impulses to provide a regulatory or trophic effect. When the flow of nerve impulses is restricted, the innervated structures become atrophic, highly irritable, and supersensitive. Striated muscles are thought to be the most sensitive innervated structures and according to Gunn, become the "key to myofascial pain of neuropathic origin." Because of the neuropathic supersensitivity, Gunn states that muscle fibers "can overreact to a wide variety of chemical and physical inputs including stretch and pressure." The mechanical effects of muscle shortening may result in commonly seen conditions, such as tendonitis, arthralgia, and osteoarthritis. Shortening of the paraspinal muscles is thought to perpetuate radiculopathy by disc compression, narrowing of the intervertebral foramina, or by direct pressure on the nerve root.

Gunn found that the most effective treatment points are always located close to the muscle motor points or musculotendinous junctions. They are distributed in a segmental or myotomal fashion in muscles supplied by the primary anterior and posterior rami. In Gunn's model, MTrPs do not play an important role. Because the primary posterior rami are segmentally involved in the muscles of the paraspinal region, including the multifidi, and the primary anterior rami with the remainder of the myotome, the treatment must always include the paraspinal muscles as well as the more peripheral muscles. Gunn found that the tender points usually coincide with painful palpable muscle bands in shortened and contracted muscles. He suggests that nerve root dysfunction is particularly due to spondylotic changes. He maintains that relatively minor injuries would not result in severe pain that continues beyond a 'reasonable' period, unless the nerve root would already be in a sensitized state prior to the injury.

Gunn's assessment technique is based on the evaluation of specific motor, sensory, and trophic changes. The main objective of the initial examination is to determine which levels of neuropathic dys-

function are present in a given individual. The examination is rather limited and does not include standard medical and physical therapy evaluation techniques, including common orthopaedic or neurological tests, laboratory tests, electromyographic or nerve conduction tests or radiologic tests, such as MRI, CT scan, or even X-rays. Motor changes are assessed through a few functional motor tests and through systematic palpation of the skin and muscle bands along the spine and in the peripheral muscles of the involved myotomes. Gunn emphasizes to assess trophic changes in the paraspinal regions segmentally corresponding to the area of dysfunction. Trophic changes may include orange peel skin (peau d'orange), dermatomal hair loss, differences in skin folds, and moisture levels (dry vs. moist skin).³⁴

Unfortunately, Gunn's radiculopathy model as a hypothesis to explain chronic musculoskeletal pain has not really been developed beyond its initial inception in 1973. Although Gunn has published numerous interesting case reports and review articles restating his opinions, most components of the model have not been subjected to scientific investigations and verification. In fact, many of Gunn's underlying assumptions are contradicted by more recent research findings. For example, Gunn's notion that persistent nociceptive input is uncommon contradicts many recent neurophysiological studies confirming that persistent and even relative brief nociceptive input can result in pain producing plastic dorsal horn changes.

The major contributions of Gunn to the field of MPS and dry needling are the emphasis on segmental dysfunction and the suggestion that neuropathy may be a possible cause of myofascial dysfunction. Certainly with regard to motor dysfunction associated with MPS, the combined impact of the primary anterior and posterior rami is an important consideration. For example, from a segmental perspective, it would be likely to see dysfunction of the C5-C6 paraspinal muscles when MTrPs are present in the more peripheral infraspinatus muscle.

The Spinal Segmental Sensitization Model

The Spinal Segmental Sensitization Model is developed by Dr. Andrew Fischer and combines aspects of Travell and Simons' trigger point model and Gunn's radiculopathy model.³⁵ Fischer proposes that the "pen-

tad of the vicious cycle of discopathy, paraspinal muscle spasm and radiculopathy” consists of paraspinal muscle spasm frequently responsible for compression of the nerve root, narrowing of the foraminal space, and a sprain of the supraspinous ligament with radicular involvement. Fischer advocates a comprehensive medical evaluation. According to Fischer, the most effective methods for relief of musculoskeletal pain include preinjection blocks, needle and infiltration of tender spots and trigger points, somatic blocks, spray and stretch methods, and relaxation exercises. Based on empirical observations, Fischer routinely infiltrates the supraspinous ligament, which “inactivates tender spots/trigger points in the corresponding myotome, relaxing the taut bands, and increasing the pressure pain thresholds as documented by algometry.” The MTrP injections with Fischer’s needling and infiltration technique are thought to “mechanically break up abnormal tissue” and “a layer of edema.” The main differences between Fischer’s and Gunn’s approach are the extent of the physical examination, the use of injection needles by Fischer, and acupuncture needles by Gunn. Fischer’s recognition of the importance of MTrPs, and the infiltration of the supraspinous ligament. Furthermore, Fischer’s model seems more dynamic. He has integrated many new research findings into his approach; for example, Fischer acknowledges that central sensitization is often due to ongoing peripheral nociceptive input. Fischer’s proposed interventions use multiple injection techniques and are therefore not that useful for physical therapists. As far as is known, the Maryland Board of Physical Therapy Examiners is the only physical therapy board that has ruled that physical therapists may perform MTrP injections.

MECHANISMS OF DRY NEEDLING

Although muscle needling techniques have been used for thousands of years in the practice of acupuncture, there is still much uncertainty about their underlying mechanisms. The acupuncture literature may provide some answers, however, due to its metaphysical and philosophical nature, it is difficult to apply traditional acupuncture principles to the practice of using acupuncture needles in the treatment of MPS.

Mechanical Effects

Dry needling of an MTrP may mechanically disrupt the integrity of the dysfunction-

al motor end plates. From a mechanical point of view, needling of MTrPs may be related to the extremely shortened sarcomeres. It is plausible that an accurately placed needle provides a localized stretch to the contracted cytoskeletal structures, which may disentangle the myosin filaments from the titin gel at the Z-band. This would allow the sarcomere to resume its resting length by reducing the degree of overlap between actin and myosin filaments.

If indeed a needle can mechanically stretch the local muscle fiber, it would be beneficial to rotate the needle during insertion. Rotating the needle results in winding of connective tissue around the needle, which clinically is experienced as a ‘needle grasp.’ Comparisons between the orientation of collagen following needle insertions with and without needle rotation demonstrated that the collagen bundles were straighter and more nearly parallel to each other after needle rotation.³⁶ Langevin and colleagues report that brief mechanical stimulation can induce actin cytoskeleton reorganization and increases in proto-oncogenes expression, including cFos and tumor necrosis factor and interleukins.³⁶ Moving the needle up and down as is done with needling of a MTrP may be sufficient to cause a needle grasp and a resultant LTR. As a result of mechanical stimulation, group II fibers will register a change in total fiber length, which may activate the gate control system by blocking nociceptive input from the MTrP and hence cause alleviation of pain.³²

The mechanical pressure exerted via the needle also may electrically polarize the connective tissue and muscle. A physical characteristic of collagen fibers is their intrinsic piezoelectricity, a property that allows tissues to transform mechanical stress into electrical activity necessary for tissue remodeling, possibly contributing to the LTR.³⁷

Neurophysiologic Effects

In his arguments in favor of neurophysiological explanations of the effects of dry needling, Baldry concludes that with the superficial dry needling technique, A-delta nerve fibers (group III) will be stimulated for as long as 72 hours after needle insertion. Prolonged stimulation of the sensory afferent A-delta nerve fibers may activate the enkephalinergic inhibitory dorsal horn interneurons, which would imply that superficial dry

needling causes opioid mediated pain suppression.³²

Another possible mechanism of superficial dry needling is the activation of the serotonergic and noradrenergic descending inhibitory systems, which would block any incoming noxious stimulus into the dorsal horn. The activation of the enkephalinergic, serotonergic, and noradrenergic descending inhibitory systems occurs with dry needle stimulation of A-delta nerve fibers anywhere in the body.³² Skin and muscle needle stimulation of A-delta and C-(group IV) afferent fibers in anesthetized rats was capable of producing an increase in cortical cerebral blood flow, which was thought to be due to a reflex response of the afferent pathway, including group II and IV afferent nerves and the efferent intrinsic nerve pathway, including cholinergic vasodilators.³⁸ Superficial needling of certain acupuncture points in patients with chronic pain showed similar changes in cerebral blood flow.³⁹

Gunn’s and Fischer’s techniques of needling both the paraspinal muscles and peripheral muscles belonging to the same myotome, appear to be supported by several animal studies. For example, Takeshige and Sato determined that both direct needling into the gastrocnemius muscle and into the ipsilateral L5 paraspinal muscles of a guinea pig resulted in significant recovery of the circulation, after ischemia was introduced to the muscle using tetanic muscle stimulation.⁴⁰ They also confirmed that needling of acupuncture points and non-acupuncture points involved the descending pain inhibitory system, although the actual afferent pathways were distinctly different. Acupuncture analgesia involved the medial hypothalamic arcuate nucleus of the descending pain inhibitory system, while non-acupuncture analgesia involved the anterior part of the hypothalamic arcuate nucleus. In both kinds of needle stimulation, the posterior hypothalamic arcuate nucleus was involved. There is no research to date that clarifies the role of the descending pain inhibitory system with needling of MTrPs.

Chemical Effects

The studies by Shah and colleagues demonstrated that the increased levels of various chemicals, such as bradykinin, CGRP, substance P, and others, at MTrPs are immediately corrected by eliciting a LTR with an acupuncture needle. Although it is not known what happens

to these chemicals when a needle is inserted into the MTrP, there is now strong albeit unpublished data that suggest that eliciting a LTR is essential.¹³

STATUTORY CONSIDERATIONS

Whether from a legal or statutory perspective, physical therapists can perform dry needling techniques, has not been considered in most states. However, the physical therapy state boards of Maryland, New Mexico, New Hampshire, and Virginia have officially determined that dry needling falls within the scope of physical therapy practice in those states.

Dry needling by physical therapists must be regulated by state boards of physical therapy and not by state boards of acupuncture or oriental medicine. Dry needling is not equivalent to acupuncture and should not be considered a form of acupuncture. For example, the New Mexico Acupuncture and Oriental Medicine Practice Act^a defines acupuncture as “the use of needles inserted into and removed from the human body and the use of other devices, modalities and procedures at specific locations on the body for the prevention, cure or correction of any disease, illness, injury, pain, or other condition by controlling and regulating the flow and balance of energy and functioning of the person to restore and maintain health.”

Obviously, dry needling involves the use of needles inserted into and removed from the human body; however, that is the only similarity between dry needling and acupuncture. Similarly, if a hammer is associated with carpenters, do plumbers become carpenters every time they use a hammer? The objective of dry needling 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 dry needling 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.”

Many boards of physical therapy in the United States have adopted a variation of the “Model Practice Act for Physical Therapy” developed by the Federation of State Boards of Physical Therapy (<http://www.fsbpt.org>). Neither the Model Practice Act or any of the actual state practice acts address whether dry needling falls within the scope of physical

therapy practice. However, based on the definitions of physical therapy practice, dry needling may well fall within the scope of practice in nearly all states. The respective statutes commonly include statements like “the practice of physical therapy means administering treatment by mechanical devices,” “mechanical modalities,” or “mechanical stimulation.” Exclusions to the practice of physical therapy are frequently defined as “the use of roentgen rays and radioactive materials for diagnosis and therapeutic purposes, the use of electricity for surgical purposes, and the diagnosis of disease.” Most state physical therapy acts do not specifically prohibit the use of needles.

Whether physical therapists are legally allowed to penetrate the skin has been addressed in few statutes and usually only in the context of performing electromyography and nerve conduction tests. The Model Practice Act does include “electrodiagnostic and electrophysiologic tests and measures.” For example, the Missouri Revised Statutes^b indicate that “physical therapy [...] does not include the use of invasive tests,” yet, the statutes state specifically “physical therapists may perform electromyography and nerve conduction test” even though they “may not interpret the results.” The California Physical Therapy Act^c does address the issue of “tissue penetration:” “A physical therapist may, upon specified authorization of a physician and surgeon, perform tissue penetration for the purpose of evaluating neuromuscular performance as part of the practice of physical therapy [...] provided the physical therapist is certified by the board to perform tissue pen-

etration and provided the physical therapist does not develop or make diagnostic or prognostic interpretations of the data obtained.” It is not clear whether the California practice act would allow dry needling at this time. In any case, it appears that physical therapists would need to be certified by the board to perform tissue perforation.

The definition of physical therapy practice in the 2004 Florida Statutes^d includes “the performance of acupuncture only upon compliance with the criteria set forth by the Board of Medicine, when no penetration of the skin occurs.” The Florida board does not indicate how acupuncture or for that matter, dry needling, would be performed without penetrating the skin and this remains a mystery. Interestingly, the physical therapy practice act in Florida does include “the performance of electromyography as an aid to the diagnosis of any human condition.”

In order to practice dry needling, physical therapists would have to be able to demonstrate competency or adequate training in the examination and treatment of persons with MPS and in the technique of dry needling. Many statutes address the issue of competency by including language like “a physical therapist shall not perform any procedure or function for which he is by virtue of education or training not competent to perform.” Obviously, physical therapists employing dry needling must have excellent knowledge of anatomy and be very familiar with the indications, contraindications, and precautions.

In summary, most physical therapy practice acts may allow dry needling, according to the various definitions of “practice of physical therapy.” Whether individual state boards would interpret their statutes in a similar fashion as the Maryland, New Mexico, New Hampshire, and Virginia physical therapy state boards have, remains to be seen.

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^a New Mexico Statutes Annotated 1978, Chapter 61, Professional and Occupational Licenses, Article 14A, Acupuncture and Oriental Medicine Practice, 3, Definitions

^b Missouri Revised Statutes, Chapter 334, Physicians and Surgeons – Therapists – Athletic Trainers, Section 334.500, Definitions

^c California Business and Professions Code, Division 2, Healing Arts, Chapter 5.7, Physical Therapy, Section 2620.5

^d The 2003 Florida Statutes, Title XXXII, Regulation of Professions and Occupations, Chapter 486, Physical Therapy Act, Section 486.021, Definitions, 11, Practice of Physical Therapy

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