




**The Functional Manual Therapist:**  
Resets to Improve the Success of  
Reinforcement and Reloading

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**Objectives**

- What is dry needling?
- Historical Significance DN to Functional DN
- Why FDN?
- Research
- Demonstrate the technique (Cause I was told I had to)


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**Background and Disclosure**

- Owner and developer of Kinetacore (functional dry needling education)
- Co-Owner of Professional Rehabilitation Consulting LLC
- Co-Owner of FIT (Functional Integrative Technology)
- Co-Owner of US Dry Needling and Physio Products
- Developer of Functional Dry Needling courses
  - FDN 1, FDN 2, FT1, FT2 and Future Advanced FDN
- Education
  - Doctor of PT, Regis University
  - Manual Therapy (eclectic background)
  - SFMA and FMS
  - Intramuscular Stimulation
  - Trigger Point Dry Needling
  - Neuro-functional Needling
  - Various other intervention and assessment paradigms

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**The Question**

**Why do we chase pain rather than “heading it off and the “functional” pass?”**

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### FAI: An example of Myopic thinking

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### Case Example

- History of posterior hip pain
- Military PT involved in high level cycling and running (last year ran 2000 miles and cycled 5000 miles)
- Imaging identified acetabular osteophytes and CAM lesion
- C/O limited hip flexion with a feeling of a bony block at 90-100 degrees of flexion

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### Many Causes of Pain

- Must move away from the pain and discover the cause.**
- Clinical Approach focused on the "Why" rather than the "What"**

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### Posture?

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Effect of global posture reeducation and of static stretching on pain, range of motion, and quality of life in women with chronic neck pain: a randomized clinical trial. *CLINICS* 2008;63(6):763-70

RESULTS: Significant pain relief and range of motion improvement were observed after treatment in both groups, with a slight reduction at follow-up time. Quality of life also improved after treatment, except for the global posture reeducation group in one domain; at follow-up, there was improvement in all domains, except that both groups reported increased pain. There were no significant differences between groups

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Trauma



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Injury largest predictor of future injury?

Clinical Journal of Sport Medicine:  
April 2000 - Volume 10 - Issue 2 - pp 89-97  
Clinical Investigations

The Relationship Between Lower Extremity Injury, Low Back Pain, and Hip Muscle Strength in Male and Female Collegiate Athletes

Nadler, Scott F. DO\*; Malanga, Gerard A. MD\*†; DePrince, Melissa MS\*; Stitik, Todd P. MD\*; Feinberg, Joseph H. MD\*†‡

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Manual Therapy (2003) 8(1), 21-28  
1356-689X/03/\$ - see front matter © 2003 Elsevier Science Ltd. All rights reserved.  
doi:10.1054/math.2002.0476

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Original article

Neuromuscular control of walking with chronic low-back pain


L. Vogt\*, K. Pfeifer<sup>†</sup>, W. Banzer\*

\*Department of Sports Medicine, Institute for Sport Sciences, Johann Wolfgang Goethe-University, Frankfurt/Main, Germany; <sup>†</sup>Otto-von-Guericke University Magdeburg, Training and Health, Germany

SUMMARY. The reported association of low-back pain and musculoskeletal disorders contributed to the examination of the lumbar spine and hip extensor activation patterns in back pain sufferers during walking. Seventeen idiopathic low-back pain male subjects and 16 healthy volunteers participated in the study. Hip joint ROMs in the sagittal plane and neuromuscular activities of erector spinae [L3, T12], gluteus maximus and biceps femoris were recorded on one randomly selected body side in each group. Analysis using the Student's *t*-test revealed significant differences for hip joint range of motion, stride time and significantly earlier onsets of the lumbar spine and hip extensors of the back pain sufferers compared with the healthy controls. It is assumed, that low-back disorders are related to changes of the lumbar spine and hip extensor recruitment pattern.

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### Repetitive Strain



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### THE LANCET

Volume 349, Issue 9066, 29 March 1997, Pages 943-947

Series

#### Repetitive strain injuries

Annalee Yassi, FRCP<sup>C</sup>

#### Summary

Repetitive strain injuries (RSI) present an increasingly common challenge to clinicians. They consist of a variety of musculoskeletal disorders, generally related to tendons, muscles, or joints, as well as some common peripheral-nerve-entrapment and vascular syndromes. These disorders generally affect the back, neck, and upper limbs, although lower limbs may also be involved. Although RSI may occur as a result of sports and recreational activities, occupational RSIs, affecting the patient's livelihood, are particularly important. These injuries result from repetitive and forceful motions, awkward postures, and other work-related conditions and ergonomic hazards. Occupationally induced RSIs are generally costly, creating a strong incentive for physicians to become familiar with the symptoms, signs, and risk factors so that they can be diagnosed early and appropriate interventions facilitated.

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### Phantom Limb?



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[Spine \(Phila Pa 1976\)](#). 2011 Oct 1;36(21):1721-7.

**ISSLS prize winner: Smudging the motor brain in young adults with recurrent low back pain.**

[Tsao H<sup>1</sup>](#), [Danneels LA](#), [Hodges PW](#).

[Psychiatry Res](#). 2012 May 31;202(2):175-9. doi: 10.1016/j.psychres.2011.08.012. Epub 2012 Jun 27.

**Imaginative resonance training (IRT) achieves elimination of amputees' phantom pain (PLP) coupled with a spontaneous in-depth proprioception of a restored limb as a marker for permanence and supported by pre-post functional magnetic resonance imaging (fMRI).**

[Meyer P<sup>1</sup>](#), [Matthes C](#), [Kusche KE](#), [Maurer K](#).

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**Stress?**



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**+**


**SYMPATHETIC AND EMOTIONAL**

- McNulty WH, Gevirtz RN, Hubbard DR, Berkoff GM. *Needle electromyographic evaluation of trigger point response to a psychological stressor.* Psychophysiology 1994;31:313-316.

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**Stupidity**



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Maybe we are looking at this from the wrong end.



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**Pain:** It is rare we treat something other than pain

*"an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described by the patient in terms of such damage"*

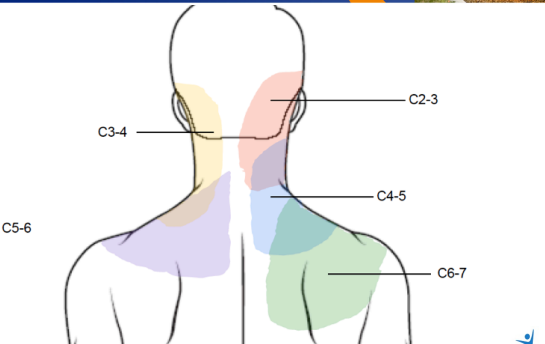
International Association for the Study of Pain.



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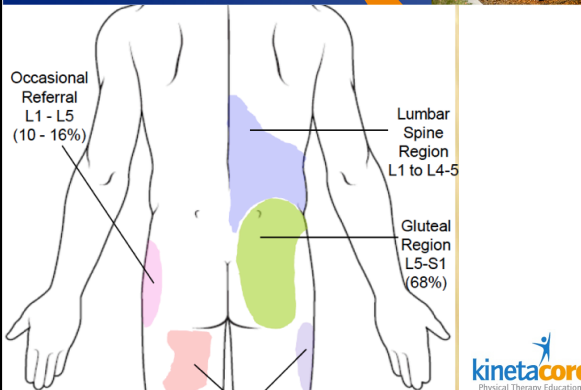
**Facet Joint Pain**



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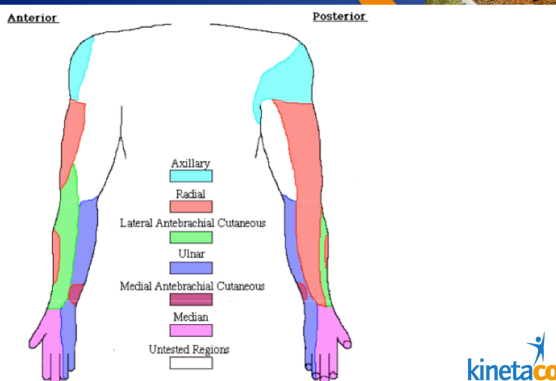
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**Lumbar Facet or Disc**

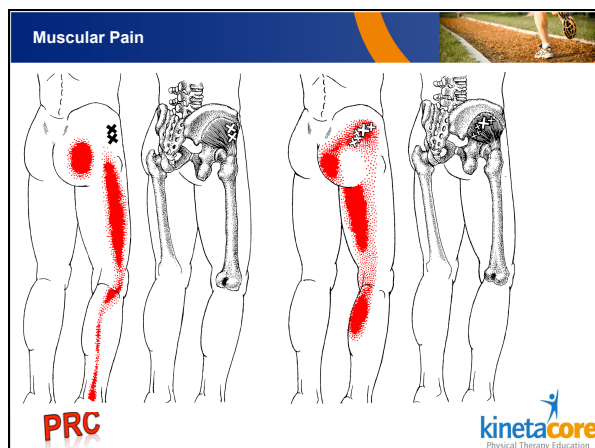


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**Referred Pain**



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**Joint BY Joint!**  
**Joint Pain = What?**

- Limited mobility, strength, control/coordination....
- What innervates peripheral joints?
- Cutaneous nerves overlying the joint
- Muscles overlying and impacting that particular joint
- What's the point?

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**Soft Tissue?**

- Soft tissue is overlooked and considered less important than joint pathology
- That is an incorrect focus for evaluation and treatment.
- What does an orthopedic test tell us?

**Do We?**


- Consider the:
  - Myotome
  - Dermatome
  - Sclerotome?

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### What is Dry Needling?

- Dry Needling:** a skilled intervention performed by a physical therapist (PT) 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.
- Called **dry** needling because it does not involve injecting a "wet" substance.
  - Affect is from the interaction of the needle and tissue.
- Goal is to illicit a local twitch response in the involved muscle.



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PubMed search results for "dry needling".

Results: 1 to 20 of 145

1. The effect of dry needling for myofascial trigger points in the neck and shoulders: A systematic review and meta-analysis. Ong J, Clayton LS. J Body Mov Ther. 2014 Jul;18(3):390-8. doi: 10.1016/j.jbmt.2013.11.009. Epub 2013 Nov 9. PMID: 25042309 [PubMed - in process] [Related citations](#)
2. Temporomandibular disorders, Part 2: conservative management. Shaffer SM, Brimble JM, Sizer PS, Courtney CA. J Man Manip Ther. 2014 Feb;22(1):13-23. doi: 10.1177/2042618613Y.0000000061. Review. PMID: 24975744 [PubMed] [Related citations](#)
3. Trigger point-related sympathetic nerve activity in chronic sciatic leg pain: a case study. Skowronka E, Ruffin M, Poremba W, Bednarski A, Bartkowski W. Acupunct Med. 2014 Jun 26. pii: asupmed-2013-010504. doi: 10.1136/acupmed-2013-010504. [Epub ahead of print] PMID: 24975043 [PubMed - as supplied by publisher] [Related citations](#)
4. Effects of Spray and Stretch On Postneedling Soreness And Sensibility After Dry Needling Of A Latent Myofascial Trigger Point. Martín-Prinziele-Sugrís A, Rodríguez-Fernández AL, García-Muro F, López-López A, Mayoral O, Merch-Jiménez JA, Fernández-Camero J. Arch Phys Med Rehabil. 2014 Jun 10. pii: S0003-9993(14)00416-X. doi: 10.1016/j.apmr.2014.05.021. [Epub ahead of print] PMID: 24928191 [PubMed - as supplied by publisher] [Related citations](#)
5. Dry needling for management of pain in the upper quarter and craniofacial region. Curry DM, Paterson RM, Menzies JB. Curr Pain Headache Rep. 2014 Aug;18(8):437. doi: 10.1007/s11916-014-0437-0. PMID: 24913453 [PubMed - in process] [Related citations](#)
6. Acupuncture for treating whiplash-associated disorder: a systematic review of randomized clinical trials. Moon TW, Poddaki P, Choi TY, Park TY, Kim HJ, Lee MS, Ernst E. Evid Based Complement Alternat Med. 2014;2014:1870271. doi: 10.1155/2014/1870271. Epub 2014 May 6. Review. PMID: 24899912 [PubMed] [Free PMC Article](#) [Related citations](#)
7. Autologous growth factor injections in chronic tendinopathy. Sandry MA. J Athl Train. 2014 Jun;49(3):428-30. doi: 10.4089/1062-6060-49.3.06. Epub 2014 May 19.

### The Evidence



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### Building The Evidence

Diagnostic Imaging	Other Diagnostics	Palpation
MRE	EMG	Interrater Reliability
Diagnostic Ultrasound Imaging	Tissue Sampling	Pain Pressure Thresholds (PPT)



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### Evidence for Energy Crisis Theory

Shah JP, et al. An invivo microanalytical technique for measuring the local biochemical milieu of human skeletal muscle. *J Appl Physiol* 2005.

Shah JP, et al. Biochemicals associated with pain and inflammation are elevated in sites near to and remote from active myofascial trigger points. *Archive Phys Med Rehabil* 2008



### Types of DN

- TPDN: Trigger Point Dry Needling
- IMS: Intramuscular Stimulation
- Neurofunctional Dry Needling
- Functional Dry Needling
- Acupuncture/TCM
  - Energetic system not based on anatomy, physiology or movement






### Trigger Point Dry Needling

- Deactivate a Trigger Point causing pain
- The classical and most commonly used description of trigger points is that defined by Travell and Simons (1992)
  - The presence of exquisite tenderness at a nodule in a palpable taut band (of muscle)
  - Trigger points produce referred pain, either spontaneously or by digital compression
- Clinical definition
  - localized areas of deep tenderness within a taut band of muscle, major clinical feature includes:
    - exhibit a local twitch response (muscle fasciculation) or jump sign (whole body movement) in response to digital pressure or dry needling
    - Pt may exhibit autonomic phenomena
- Developed by Janet Travell MD, and Dave Simons MD (and others)
- Purpose is to recognize muscles cause pain and can be treated through deactivation of Trigger Points
- Used by PT's, MD's, DC's, DO's, and TCM providers

### Intramuscular Stimulation

- Reduce stress on the peripheral nervous system caused by degenerative changes at the segment and entrapment of the nerves at the segment and in the periphery
- Intension is to elicit a noxious input to desensitize supersensitive structures, not just muscle tissue.
  - Based on Cannon and Rosenbleuth's work (1949)
- Developed by C. Chan Gunn MD while working as a Work Comp doctor in Western Canada
- Used by PTs, Acupuncturists, MDs and Chiro's
- Mainly for pain management

### Neurofunctional Needling

- Transition of theoretical concepts of energetics-based acupuncture to recognizing that the nerves are likely the system that is being treated by stimulation of acupuncture points
- Being developed by numerous practitioners and professions, namely Alejandro Eliorriaga MD of Toronto Canada
- Focus is to stimulate the nervous system to reduce neurological dysfunction and pain caused by that dysfunction

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**All of those Focus on Pain!**

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**Progression to the Future of Rehabilitation**

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### Functional Dry Needling

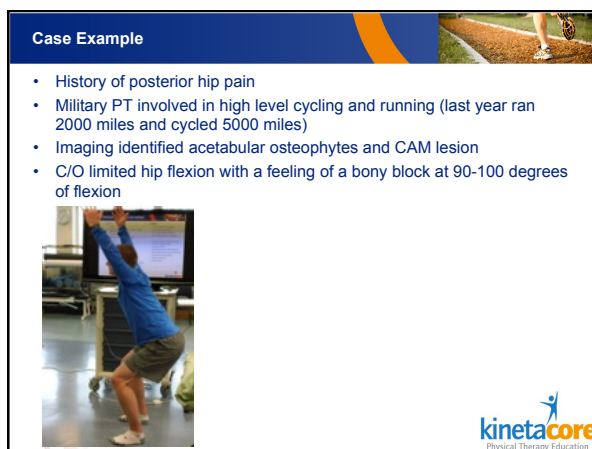
- Transition of needling for pain relief, trigger point deactivation, and muscular tension/release to functional restoration and a diagnostic tool
- Developed by Edo Zylstra and KinetaCore Staff with input from and interaction with numerous others (Large input from FMS group)
- Based on a functional assessment to guide treatment
  - Needling is the end result of the assessment
  - Sniper vs Carpet Bomber

RE-SET (then Re-inforce & Re-load)

Diagnose?

No longer focusing on pain but the CAUSE of that PAIN

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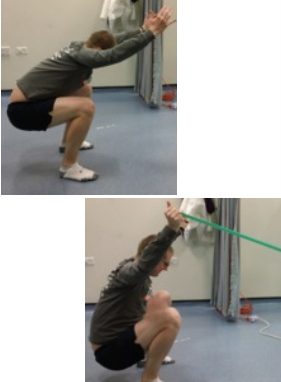
### Treatment

- Course participant
- Hip and Lumbar spine FDN had minimal effect

Right hip demonstrated positive scours, **Thomas Test**, FABERE's, FADIR's and ROM passively of 15-0-100 degrees with solid end feel and apprehension with end range hip flexion, FADIR's and FABERE's tests. Active ROM 5-0-100 degrees.

Squat corrected significantly after treatment of: ?

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### Why Did Rectus Femoris change the Squat?

- Must have a solid understanding of anatomy and its function

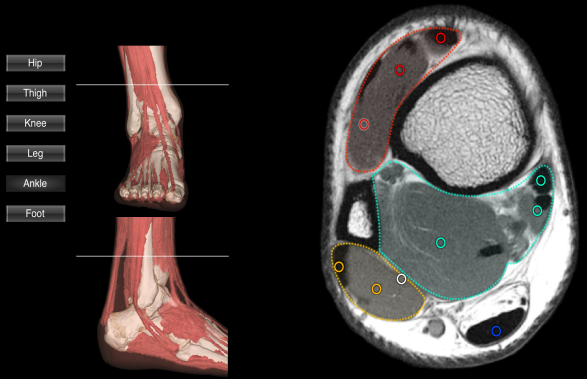
For Example

- Lumbar multifidus
- Rectus Femoris
- Short head of the Biceps
- Popliteus
- Tibialis Posterior and Anterior
- Flexor Hallucis Longus

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### Flexor Hallucis? Really?



Just in case you think we can't make long-term changes

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**Reliance on Symptoms**

- What are symptoms?
- Patient/Athlete sees the symptom as Pain and something limiting their ability to play at a high level.
- We see clinical symptoms.
  - ROM
  - Strength
  - Facilitation
  - Control
  - Gait
  - FMS
  - SFMA
- This should guide us to the cause for the Patient/Athlete's symptoms

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**Our Goal with FDN**

- Have a clear idea for why the athlete/patient has pain/movement dysfunction
- Utilize objective data to determine outcome.
- Utilize needling to both treat pain and dysfunctional tissue limiting proper movement and control AND as a diagnostic tool.
  - Reproduce discomfort
  - Correct movement pattern
  - Improve recruitment

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**Future?**  
Get Away from Surgery and the Idea that Pain is bad.  
Research

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**Questions?**

Demonstration

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