Expanding Your Orthopedic Toolbox:

Additional Options in Physical Therapy

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Additional / Alternative Tools in Your Box? Really?
Orthopedic Special Tests for the Shoulder:

(UUUGGGGHHH. Here we go):

1. Acromioclavicular (AC) Joint Distraction Test
2. Acromioclavicular (AC) Shear Test
3. Adson’s Maneuver
4. Allen Test
5. Anterior Drawer Test
6. Apley’s Scratch Test
7. Apprehension Test
8. Brachial Plexus Stretch Test
9. Biceps Load Test
10. Clunk Test
11. Crank Test
12. Cross-Over Impingement Test
13. Drop Arm Test
14. Empty Can (Supraspinatus) Test
15. Feagin Test
16. French Horn Test
17. Grind Test
18. Hawkins Test / Hawkins-Kennedy Impingement Test
19. Jobe Relocation Test
20. Load and Shift Test
21. Ludington’s Sign
22. Neer Impingement Test
23. O’Brien’s Test
24. Pectoralis Major Contracture Test
25. Piano Key Sign
26. Posterior Drawer Test
27. Roos Test
28. Shoulder Abduction Test
29. Speed’s Test / Speed’s Maneuver
30. Sternalclavicular (SC) Joint Stress Test
31. Sulcus Sign
32. Tegason’s Test
33. Yocum Test
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Why Talk About “Alternative” Therapies?

I roamed the countryside searching for answers to things I did not understand.

~ Leonardo da Vinci
Myofascial Trigger Point (MTrP): “A hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction, and autonomic phenomena.”

Myofascial Pain Syndrome: “The sensory, motor, and autonomic symptoms caused by MTrP.”

Soft Tissues Include Fascia
Splenius muscle of the neck

Levator scapulae muscle

Rhomboids detached from the spine and lifted laterally together with the scapula

Serrati posterior fascia

Trapezius muscle with its fascia

Serratus posterior inferior muscle
skeletal muscle
perimysium
epimysium

regularly arranged collagen bundles
Fascia Is Well Innervated

<table>
<thead>
<tr>
<th>Per cm²</th>
<th>Brachial Fascia</th>
<th>Lacertus Fibrosis</th>
<th>Antebrachial Fascia</th>
<th>Flexor Retinaculum</th>
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</thead>
<tbody>
<tr>
<td>Free Nerve Endings</td>
<td>48.5</td>
<td>27.36</td>
<td>44.37</td>
<td>53.55</td>
</tr>
<tr>
<td>Pacini Corpuscles</td>
<td>0.43</td>
<td>0.26</td>
<td>0.26</td>
<td>0.66</td>
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<tr>
<td>Ruffini Corpuscles</td>
<td>0.29</td>
<td>0.1</td>
<td>0.26</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Idealized image of the deposition profile of hyaluronan

HYALURONIC ACID
**A** The two fibrous layers are free to glide thanks to the presence of low viscous loose connective tissue. This permits these layers to transmit the forces (represented by the orange arrows) independently and in different directions.

**B** The densification of the loose connective tissue represented with a red flash, alters the gliding between the two fibrous layers. The transmission of the forces can be altered in a way that is not easily defined. The tissue around the densification point can be subjected to intense mechanical stress.

Fascial Densification
Shah and colleagues demonstrated significantly higher concentrations in active MTrP of:

1. Interleukin 1 & tumor necrosis factor (inflammatory cytokines)
2. Calcitonin gene related peptide, substance P (pain-associated neuropeptides)
3. Bradykinin (peptide/protein causing vasodilation)
4. Serotonin (neurotransmitter, vasoconstrictor, affects muscle contractions)
5. Norepinephrine (hormone/neurotransmitter, vasodilation)

“We have confirmed that biochemicals associated with pain, inflammation, and intercellular signaling are elevated in the vicinity of active MTrP’s. Furthermore, subjects with active MTrP’s in the upper trapezius have elevated levels of these biochemicals in a remote, unaffected muscle, suggesting that these conditions are not limited to localized areas of active MTrP’s.”

Biochemicals associated with pain and inflammation are elevated in sites near to and remote from active myofascial trigger points. Jay P. Shah and colleagues, Archives of Physical Medicine and Rehabilitation 89.1 (Jan 2008): p16(8).
Fascial Densifications and MTrP are Thought to Arise from Soft Tissue Overload

30 min computer work leads to the development of MTrP in the upper trapezius

Dry Needling/Intramuscular Manual Therapy

- Causes deformation of muscle fiber when needle contacts MTrP.
- Induces a local twitch response by activation of the nociceptive receptor by means of a spinal cord reflex.
- Causes an immediate reduction in Interleukin 1, tumor necrosis factor, calcitonin gene related peptide, substance P, bradykinin, serotonin, norepinephrine.
Fascial Manipulation

Mathematical Analysis of the Flow of Hyaluronic Acid Around Fascia During Manual Therapy Motions

Center of Coordination (CC) – where vectors from muscle fiber contractions converge.

Center of Perception (CP) – where movement occurring at the joint is perceived.
Antelateral

Retrolateral

Antemedio

Retromedio

**AN-LA-GE 1, 2, 3**
1: above upper/outer border of patella where VL terminates fusing with fascia
2: lateral to lower pole of patella over joint space and lateral retinaculum
3: over insertion of TA onto lateral surface of tibial tuberosity

**RE-LA-GE 1, 2**
1: medial to distal part of biceps femoris tendon
2: proximal part of lateral gastroc, behind fib head

**AN-ME-GE 1, 2, 3**
1: distal portion of VM
2: medial joint space
3: area between pes anserine insertions to beneath medial condyle of tibia, against the medial gastroc

**RE-ME-GE 1, 2**
1: between semimebranosus & semitendinosus tendons
2: over proximal part of medial gastroc tendon
Fascial Densification

MTrP

Acupuncture Point
1. Patient History
Regional Interdependence: A Musculoskeletal Examination Model Whose Time Has Come

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TIMOTHY W. FLYNN, PT, PhD, ECS, OCS, FAAOMPT4

“Regional interdependence is the concept that seemingly unrelated impairments in a remote anatomical region may contribute to, or be associated with, the patient's primary complaint.”
KINETIC (MOVEMENT) CHAIN

CONCEPT SUPPORTING DYSFUNCTION REMOTE TO THE SITE OF PAIN:

1. Takes into consideration that muscles, joints, nerves, and connective tissues are a continual matrix and their movements are interrelated.

2. Assumption is that when elements of the “chain” are not providing normal support or alternatively, flexibility, then movement anywhere along the chain can be adversely effected and symptoms arise.

3. Necessitates consideration that the site of pain or dysfunction may be arising from a movement dysfunction remote to the site.
APTA VISION STATEMENT

“Transforming society by OPTIMIZING MOVEMENT to improve the human experience.”
II. **Movement Assessment**
Movement Testing Standards:

1. Test is Reliable & Valid
2. Minimal equipment & time
3. Test performance is modifiable
4. Results are actionable
5. Programming using Test-Retest
III. PALPATION
Palpate the Site of Pain
Bilateral Simultaneous Palpation
AN-LA-TH 1, 2
1: 4th intercostal space, halfway between midclavicular line and midaxillary line (serratus anterior insertion)
2: 5th intercostal space (serratus anterior insertion)

RE-LA-TH
Inferior border of trapezius between T5-T7

AN-ME-TH 1, 2, 3
1: in 1st & 2nd intercostal space against sternum
2: in 3rd & 4th intercostal space against sternum
3: in 5th intercostal space and to side of xiphoid process
*explore entire region between 1-3

RE-ME-TH 1, 2, 3
1: T2-3
2: T4-6
3: T7-11
*explore entire region between erector spinae and spinous processes of 1-3

THORAX

Antelateral
Retrolateral
Antemedio
Retromedio
Demonstrations
Case Reports
Dry Needling.mp4
Fascial Manipulation

- https://www.youtube.com/watch?v=-JvdxxYOjEs
- AAOMPT SSIG
Trigger Point Dry Needling

Jan Dommerholt, PT, MPS, FAAPM
Orlando Mayoral del Moral, PT
Christian Gröbli, PT

From Clinical Experience to a Model for the Human Fascial System

Julie Ann Day, PT, Lorenzo Copetti, PT, Giorgio Rucli, PT

An Evidence-Informed Review of the Current Myofascial Pain Literature - January 2015

Jan Dommerholt, PT, DPT, DAAPM
Rob Grieve, PT, Ph.D
Michelle Layton, PT, DPT, OCS, FAAOMPT
Todd Hooks, PT, ATC, OCS, SCS, FAAOMPT

Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual (2-Volume Set)
by David G. Simons and Janet G. Travell

Trigger Point Dry Needling: An Evidence and Clinical-Based Approach, 1e 1st Edition
by Jan Dommerholt PT, DPT, MPS, DAAPM, Cesar Fernandez de las Penas, PT, PhD

Myofascial Trigger Points: Pathophysiology and Evidence-Informed Diagnosis and Management (Contemporary Issues in Physical Therapy and Rehabilitation Medicine) 1st Edition
by Jan Dommerholt & Peter Huijbregts


