

ISSUE ADAPTION TO MECHANICAL LOAD: A SUMMARY

Inadequate (Disuse/Immobilization)	Overload (Remobilization)	Excess Overload (Overload)
Loss of ground substance	Cell proliferation & activity	↑ tissue strain →
Water Loss	↑ collagen production	cell death
↓ inter-fiber distance	↑ matrix organization	Inflammation
↓ collagen fiber bundle size	↑ ground substance	Degeneration
↑ cross-linking between existing collagen	↑ inter-fiber distance	Fibrosis
	↑ blood flow	
↓ inter-fiber mobility	↑ skin temperature	
Collagen disorganization	↑ tissue extensibility	
Eventual net collagen loss	Release of adhesions	
Insertion site weakening	↓ muscle tone	
↓ structural properties	↑ structural properties	

SOFT TISSUE / TRIGGER POINTS

Multidisciplinary Perspectives on Soft-Tissue Treatment and Research

Warren Hammer, MS, DC, DABCO

"Addressing the Myofascial Component of Musculoskeletal Pain," a two-day conference held at the University of Pittsburgh on May 7-8, marked a historic first for the chiropractic profession. Over a year ago, four doctors of chiropractic got together and decided that with interest in soft tissue beginning to permeate our profession, why not create a conference and invite scientists and clinicians from all professions interested in soft-tissue research and treatment? Why not invite representatives from all areas of the soft-tissue world that have clinically proven successes? In short, this was a conference conceived by DCs who decided that they had enough of the petty bickering between professions as to who could achieve the best results.

More than 200 clinicians attended the conference, sponsored by the University of Pittsburgh School of Health and Rehabilitation Sciences and the University of Bridgeport College of Chiropractic. The conference was attended by chiropractors, physical therapists, medical doctors, Roling structural integrationists, massage therapists and others. An interesting touch was that no one's name tag designated their professional training.

I did not meet any attendee who was not extremely satisfied with this conference. The two-day event was divided between morning scientific lectures and afternoon workshops. Highlights from the conference included the following lectures and workshops:

Aaron Mattes, MS, RKT, LMT, discussed [active isolated stretching \(AIS\)](#) for the shoulder, wrist and hand. Aaron has used his system of stretching for many years on some of our most prominent athletes and professional sport teams. He uses a reciprocal inhibition technique that allows stretching while avoiding the Golgi tendon reflex.

For example, a supine patient brings their lower extremity up (using the quads) to the end-range and

the clinician then stretches the hamstrings while they are reciprocally relaxed. The muscles are gently stretched for 1½ to 2 seconds using only 1 pound of pressure while the patient actively contracts the antagonistic (quadriceps) muscle. Stretching is repeated for about 12 reps.

There is still a debate going on as to [whether a single bout of stretching acutely impairs muscle strength](#), with a lesser effect on power.¹ Since Mattes' method does not allow active muscle contraction during the stretch, this type of stretching would probably not result in injury or weakness.

Michael Leahy, DC, CCSP, originator of [active release techniques \(ART\)](#), presented some new ways of using ART. He described typical ART protocol as first shortening the affected tissue, placing a contact on the involved site and applying tension, then lengthening the tissue (causing relative motion) and releasing the area by using contact tension.

He privately told me about his recent success in treating frozen shoulders by applying tension in the axillary area to the anterior capsule and using a method of holding the area with tension and a twist. It is necessary to hold the contracture for awhile to affect the myofibroblasts. Hopefully he will be writing a paper on the subject soon.

[Thomas Hyde, DC, DABSP](#), spent his two-hour session demonstrating and informing the audience about functional and kinetic treatment with rehab, provocation and motion (FAKTR-PM). The essence of the technique is to treat patients during motion with and without load to see where pain is provoked, and then to treat that area. While Dr. Hyde primarily uses Graston Technique, he also recommended using all types of soft-tissue methods and instrument-assisted mobilization methods. He also demonstrated the use of kinesiology taping as taught in the FAKTR-PM course.

Julie Ann Day, PT, from Italy, gave an introductory course on [fascial manipulation](#). She represented Luigi Stecco, PT, who has written six textbooks on the fascial system and the use of this technique. "This technique now presents a complete biomechanical model that assists in deciphering the role of fascia in musculoskeletal disorders. Its mainstay lies in the identification of a specific, localized area of the fascia in connection with a specific limited movement. Once a limited or painful movement is identified, then a specific point on the fascia is implicated and, through the appropriate manipulation of this precise part of the fascia, movement can be restored."²

In this workshop, evaluation of the kinetic chain was emphasized, especially during the case history. It was demonstrated how, for example, a painless old ankle sprain might be related to a chronic compensatory lower back pain. In the case presented, the patient had completely forgotten about the ankle, but evaluation of the fascia of the foot based on gait testing revealed it. Treatment of specific tender fascial points related to the ankle immediately improved the gait and most interestingly, diminished the back pain.

Leon Chaitow, DO, ND, author of at least 70 books on soft-tissue methods, demonstrated [positional release techniques \(strain-counterstrain\)](#), muscle energy, and some of Mulligan's nag and snag techniques, among others. The basic concept in positional release is to passively move a joint into a position of greatest comfort or put muscles in a shortened position while feeling the tender point release and diminish in pain. While the originator of [strain-counterstrain](#) wanted the clinician to hold a point for 90 seconds, different authors have recommended from 20 seconds to 20 minutes to release the tension.

Tom Findley, MD, PhD, a structural integrationist, remarked on findings from the [International Fascia Research Congress](#), held in 2007 and again in 2009. He spoke on mechanotransduction between the cytoskeletal structure and the extracellular matrix and its implications for health and disease, the biomechanical properties of fascial tissues, innervations of the fascia, forms of mechanical signaling within the fascial matrix and tensegrity. Go to www.fasciaresearch.com for more information.

Michael Schneider, DC, PhD, reviewed the literature on fibromyalgia and myofascial pain. He discussed the fibromyalgia syndrome (FMS) guidelines as expressed by the European League Against Rheumatism and the American Pain Society. He concluded that FMS does not exist as a clinical entity and quoted Wolfe (2009) that *FMS* is a clinically convenient term to identify patients with high levels of poly-symptomatic distress on a continuum known as "fibromyalgianess."³

TISSUE ADAPTATION TO MECHANICAL LOAD: A SUMMARY

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Insertion site weakening	↓ muscle tone	
↓ structural properties	↑ structural properties	
↓ mobility	↑ mobility	

*This diagram was created by Dr. Terry Loghmani, conference presenter/speaker, to summarize existing research on how soft tissue is influenced by different types of mechanical load.

M. Terry Loghmani, PT, PhD, spoke on the subject of instrument-assisted soft tissue mobilization (Graston Technique): a conservative treatment alternative to enhance connective tissue healing. [She described the findings in her recent JOSPT article⁴](#); the use of instrument-assisted cross-fiber massage accelerated ligament healing, possibly via favorable effects on collagen formation and organization. An excellent chart created by Dr. Loghmani sums up much research on the effect of different types of mechanical load on soft tissue.

Siegfried Mense, MD, professor in the department of neuroanatomy at Heidelberg University and a

world authority on the neuroanatomy and neurophysiology of muscle pain, spoke about four sets of data that lead to four main conclusions: 1) Excitation of muscle nociceptors and hence the occurrence of muscle pain depends on the balance of sensitizing and desensitizing chemical factors in the muscle. 2) For central sensitization to occur, sub-threshold synaptic potentials are sufficient. 3) Spinal glial cells are important factors for muscle pain and hyperalgesia. 4) Many cases of unspecific LBP may be due to input from the thoracolumbar fascia, rather than from input from muscles of the low back.

Finally, Jay Shah, MD, spoke on how to evaluate and identify muscular trigger points and their referral patterns of pain. He demonstrated that active myofascial trigger points (MTrPs) have elevated levels of biochemicals such as inflammatory mediators, neuropeptides, catecholamines, cytokines, etc. ,known to be associated with persistent pain states, inflammation, and sensitization. He showed ultrasound techniques that visualized MTrPs and measured their stiffness properties and local blood flow.

Thanks to Drs. Michael Schneider, Richard Vincent and Thomas Hyde for initiating this conference. Special kudos to Dr. Schneider, who does research at the University of Pittsburgh and was responsible for most of the conference organization and administration. Stay tuned; the next conference is already in the works.

References

1. McHugh MP, Cosgrave CH. To stretch or not to stretch: [the role of stretching in injury prevention and performance](#). *Scand J Med Sci Sports*, 2010;20:169-81.
2. Manual for "Addressing The Myofascial Component of Musculoskeletal Pain," May 7-8, 2010, sponsored by the University of Pittsburgh and the University of Bridgeport.
3. Wolfe F. "[Fibromyalgianess](#)." *Arthritis Rheum*, June 15, 2009;61(6):715-6.
4. Loghmani M, Warden SJ. [Instrument-assisted cross-fiber massage accelerates knee ligament healing](#). *JOSPT*, July 2009;39(7):506-513.

If you're wondering why the fourth DC involved in bringing this conference to fruition was not mentioned, it's because it's Dr. Hammer himself. While modesty prevents him from pointing it out, we have no problem doing so.

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