

Fascia: Unlocking Its Secrets

Warren Hammer, MS, DC, DABCO | DIGITAL EXCLUSIVE

It is rare for chiropractic to be mentioned in a feature article of a prominent newspaper, let alone *The Washington Post*, but what may be even more significant is this article's mention of DCs who evaluate and treat the fascial system of the body.¹

In [the article](#), titled "Everywhere in Your Body Is Tissue Called Fascia. Scientists Are Unlocking Its Secrets," Grinnell, professor of cell biology at the UT Southwestern Medical School, says that while many researchers and body practitioners such as chiropractors focus on fascia, other scientists are less enthusiastic about its potential. "If you talk to most surgeons, they would think of it as 'something that you cut through'" and "within the medical community, there are widely diverse opinions about the importance of fascia."²

The article mentions Carla Stecco, an orthopedic surgeon and professor of human anatomy and movement sciences at the University of Padova in Italy, who wrote an anatomy textbook on fascia based on over 100 human dissections of unembalmed cadavers.³ Based on what is currently known about the fascial system, especially its influence on muscle proprioception and muscle contraction alone, I believe this work should be a standard textbook in every healing arts college in the world.

The Stecco family, including Antonio Stecco, MD, PhD, and Luigi Stecco, PT, the founder of fascial manipulation (FM), and many others are responsible for much of the evidence-based information on the function, evaluation and treatment of the fascial system.

Fascia: A Sensory Organ

Probably the most important breakthrough in anatomy in the past century is that fascia, which covers almost everything in the human body, is a sensory organ. It is not logical to believe that nature would provide a continuous tensional network of tissue throughout the body that covers and connects every organ, nerve, muscle (including every muscle bundle and muscle fiber) as just "white packing stuff that one first has to clean off, in order to see something."² So what has fascia being a sensory organ have to do with our practice of chiropractic?

Connecting Fascia and Chiropractic

Probably the most obvious is that the thoracolumbar fascia is considered the cause of nonspecific low back pain⁴ due to the amount of free nerve endings and nociceptive fibers within this fascia. But another sensory attribute of fascia may be more important.

The central nervous system (CNS), in order to be aware of complete muscle function, requires information from muscle receptors (muscle spindle cells). These receptors constantly supply the brain with necessary information concerning the ever-changing tone in muscles, as well as the present position of muscles in space at any time during a movement. The CNS also reports absolute length and rate of change (velocity) of the length of the muscle.

This function is called proprioception as performed by the spindle cell - the sense of oneself, providing a conscious awareness of the posture and movements of our own body. With normal proprioception, the spindle cell reports on absolute length and rate of change (velocity) of the length of the muscle. Proprioceptors measure muscle activity and joint position.⁵

Without normal proprioception, movements are clumsy, poorly coordinated and inadequately adapted to complex tasks. During movement, the spindle cell is stretched by the Gamma nerve. The CNS relies on afferent input from these spindle cell receptors (when stretched) to give it the information it needs to direct smooth and coordinated muscle movement.

Just based on this information, it becomes obvious that every approach we use for the treatment of the musculoskeletal system must include a method that helps to restore smooth and coordinated muscle movement. No matter what exercise, modality or manipulation is in your toolbox, restoring normal muscle tone and coordination must be accomplished.

Muscle Spindle Cells and Fascia

Most people in the healing arts are not aware that this most important receptor for muscles, the muscle spindle cell, is located in the fascia³ and not in the muscles. Carla Stecco thinks they should be called *fascial spindle cells* instead of muscle spindle cells.

Fascia normally glides on muscle fibers (endomysium), muscle bundles (perimysium) and muscle bellies (epimysium), as well as many other areas. It is hypothesized that injury, surgery, overuse, and poor posture can cause a densification of fascia (lack of gliding due to entanglement of hyaluron in the loose connective tissue) between muscles and fascia over time.⁶

However, since the spindle cells are entirely in fascia, fascial densification will prevent normal stretching of the spindle cell and other receptors during movement. There will be a lack of proper afferent stimulation to the CNS, resulting in a percentage of the stimulated muscle fibers supplied by the cord (alpha motor neurons) becoming weakened or delayed, with poor transmission of muscle force and loss of the correct muscle vector to the joint. The result: muscle and joint pain, and poor coordination.

For many years manual practitioners have been treating all types of points such as neurolymphatic, neurovascular, acupuncture and trigger points, to mention a few. Years ago, Luigi Stecco found specific points that he designated as Centers of Coordination (CCs) and Centers of Fusion (CFs) that are within fascial tissue and mostly over mechanoreceptors and proprioceptors.

While most spindle cells are in the belly of muscles (CCs), there are [other receptors](#) in the distal tendons of joints and joint fascia (CFs) that also report back to the CNS such as the Ruffini, Pacinian receptors and Golgi tendon organs (GTO). These receptors also register joint mechanical deformation, angle change and muscle tension (GTOs).

Langavini⁷ proposed that the anatomical relationship of acupuncture points and meridians to connective tissue planes is relevant to acupuncture's mechanism of action, and suggests a potentially important integrative role for interstitial connective tissue. The acupuncture system is within the fascial system, and most of the CCs and CFs are acupuncture points. However, unlike traditional acupuncture, the fascial points in the deep fascia require a manual pressure to free the fascia that contains the receptors.

As differentiated from other types of points, definite sequences / lines of fascia exist,⁸ and

densification within these lines can result in functional weakness and pain along particular directions (kinetic chain). FM practitioners know they are treating the correct sequence / line when, after treating one or two points along a line, there is an immediate restoration of muscle function and relief of pain.

Clinical Applications

Most trigger-point treatment is on the site of pain and not related to any type of pathway. For example, a scapular area can be treated, but why is the scapular area painful? Could it be related to a previous cervical, thoracic, lumbar or shoulder problem?

If there is a palpatory CC or CF relation between these segments, then comparative palpation of receptor densifications of these segments will reveal which sequence to treat. Often, based on the history of the patient, tender restricted fascial areas distant from the site of pain are treated and provide instant relief for the patient. These fascial receptors, along with their connecting fascia within the trunk and extremities, explain why an old ankle sprain is responsible for a chronic knee, hip or low back problem.

Treating fascia appears to decrease recidivism and restore function in record time. Professional teams such as the Arizona Diamondbacks, New York Mets and many others are achieving spectacular results using fascial manipulation methods.

Editor's Note: To learn more about fascial manipulation, go to www.pubmed.com (enter *stecco a*, *stecco c* or *fascial manipulation*) or visit www.fascialmanipulation.com.

References:

1. Damiani R, Spiker T. "Everywhere In Your Body Is Tissue Called Fascia." The Washington Post (Health & Science), Jan. 27, 2019.
2. Schleip R. Forward to Fascial Manipulation Practical Part - First Level, 2nd Edition. Stecco L, Stecco A. Italy: Piccin, 2018.
3. Stecco C. Functional Atlas of the Human Fascial System. Elsevier, 2015.
4. Tesarz J, et al. Sensory innervation of the thoracolumbar fascia in rats and humans. Neuroscience, 2011;194:302-308.
5. Kandel ER, et al. Principles of Neural Science 5th Edition. McGraw Hill, 2013.
6. Pavan PG, Stecco A, Stern C, Stecco C. Painful connections: densification versus fibrosis of fascia. Curr Pain Headache Rep, 2014;18:441.
7. Langevin HM, Yandow JA. Relationship of acupuncture points and meridians to connective tissue planes, Anat Rec, 2002 Dec 15;269(6):257-65.
8. Stecco A, Macchi V, Stecco C, et al. Anatomical study of myofascial continuity in the anterior region of the upper limb. J Bodyw Mov Ther, 2009 Jan;13(1):53-62

JULY 2019