# Myofascial Lines

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*Fascia has been enjoying the limelight our field as one of the hottest topics in recent conference programming, workshops and publications. If it's new to you, please know that we'll be sending out myofascial information in little bits just to members (like we have the joint-specific articles these past couple months) AND we'll be offering more information at conferences on fascia and myofascial release.* Ruth Sova

A great place to start is with the writings of Thomas Myers book *Anatomy Trains: Myofascial Meridians for Manual and Movement Therapists* (Churchill Livingstone 2001), which offers a unique perspective on the body's internal design and has sparked research into fascia (or connective tissue) and its role in human movement and function.

***Fascia forms a whole-body, continuous three-dimensional matrix of structural support*** around our organs, muscles, joints, bones and nerve fibers. This multidirectional, multidimensional fascial arrangement also allows us to move in multiple directions (Myers 2001; Huijing 2003; *Stecco 2009).*

***Fascia assists in absorbing biomechanical stress – it's a Force Transmitter.*** The internal force (from muscle) and external force (gravity and ground reaction) are transmitted and dispersed within the body primarily via the fascial network (so long as the force is not too great). Fascia helps prevent or minimize localized stress in a particular muscle, joint or bone, and it helps harness momentum created from the operating forces mainly through its viscoelastic properties. This protects the integrity of the body while minimizing the amount of fuel used during movement.

The myofascial lines depicted in *Anatomy Trains* give us a clearer picture of how the fascia mitigates stress—and force—through the body depending on the direction and application of force (Myers 2001; Huijing 2003; Sandercock & Maas 2009).

***Davis's law states that soft tissue, a form of fascia, will remodel itself*** (becoming stiffer and denser) along lines of stress (Clark, Lucett & Corn 2008). This can have short-term benefits and long-term consequences. When we practice a movement repetitively, soft tissue will remodel itself in the direction of the desired movement so that the tissue becomes stronger at dealing with the forces in that particular direction. Long-term repetition can make fascia stiffer along the line of stress, but weaker in other directions, resulting in a possible higher frequency of tears in the fascia itself or immobility in the surrounding joints when moving in different directions. The same can be said of repetitive nonmovement, such as sitting or standing, for long periods across days, months and years.

***Fascia Can Heal and Hypertrophy.*** A 1995 study demonstrates that mechanical stress (exercise) can induce hypertrophy of a ligament, a form of fascia (Fukuyama et al. 1995). New studies demonstrate the fascia system's ability to heal itself after being torn. One such study found some people with anterior cruciate ligament (ACL) tears were able to return to full function without

surgery and that the ACL healed completely (Matias et al. 2011). As we learn more, we may see new types of rehabilitation techniques, as well as changes in what we believe to be ideal form for some exercises.

***Fascia Can Act Independently of the Central Nervous System.*** Fascia is always under tension as long as gravity is present. This passive pre-tension has been called human resting myofascial tone—which Myers discusses using the principle of tensegrity (Alfonse et al. 2010; Myers 2001). Resting myofascial tone provides a low-level stabilizing component that helps our posture and allows us to perform movements like getting in and out of a car without thinking about them.

Because connective tissue has 10 times more proprioceptors than muscle (Myers 2011), the fascial matrix helps us react to our environment faster than the conscious mind can respond, whether we are unexpectedly stepping off a curb, reacting the person moving quickly in the store aisle or drawing a hand off a hot stove.

This pre-tension may also give us the ability to maintain posture with less fatigue and fascial strain as compared with constant muscle activation and energy expenditure.

***Mood Influences Fascia.*** In their book *The Endless Web: Fascial Anatomy and Physical Reality* (North Atlantic 1996), R. Louis Shultz and Rosemary Feitis discuss how our emotions are stored within the body, including the connective tissue.

*"The physical response to emotion is through the soft tissue*," they write. "*The fascia is the emotional body. . . . Ideally, feelings are felt in the total body—emotions travel through the fascial web. We then interpret the physiological sensation as anger, affection, love, interest and so forth. . . . The reason your neck can't straighten and lengthen may be because of the shock of being continually bullied in childhood. Physical work will only partially open that problem unless there is recognition that there may be an emotional origin."*

Using this concept, the health wellness aquatic professional can develop a holistic approach to understanding posture and movement—an approach that sees them, not just as physical, but as emotional and psychological as well. Fascia may become stiffer and less compliant when a client is depressed, anxious and fearful (Shultz & Feitis 1996; Lowe 1989). Trainers see this when clients show up after having a miserable day. Mood greatly influences posture, movement and proprioception. Perhaps enhancing mood may enhance the physical state through the fascial web.

***Fascia Allows Us to Train the Body as a Whole.*** In Myers's work, dissections demonstrated that connective tissue not only envelops muscle, bone and organs but does so continuously through many layers (Myers 2001). This link connects us holistically in movement and function. For those looking to improve or maximize function, the fascial web gives us a rationale for incorporating whole-body movements into our training regimens. This is very like Loaded Movement Training.

***Training myofascial lines with whole-body exercises has unique benefits***. It dissipates force throughout the entire system, minimizing excessive isolated joint tension while giving our joints freedom to move in all three planes of motion and improving total-body awareness and

coordination. Choosing exercises that vary in direction, force and speed also promotes fascial health (Myers 2011).

To place force through a line, the line must first load to unload, or stretch to shorten. This allows us to take advantage of the viscoelastic properties of fascia, helping us generate and transmit force throughout the entire body while minimizing energy expenditure. Based on the force profile (mass, acceleration, momentum, direction and application) of a given exercise, we can emphasize which myofascial line to upregulate (load).

We cannot isolate myofascial lines during a movement, but we can emphasize a particular line based on our basic understanding of biomechanics, so you may notice multiple lines being loaded in these exercises.

***Functional Results.*** The more we learn about connective tissue, the more we can integrate it with the other systems of the body (muscular, nervous, skeletal) and gain further insight into human movement and performance. Using myofascial lines can give us a unique perspective on how to maximize our ability to mitigate force, save energy and build endurance while improving multijoint mobility and strength. Training the body as a whole in three dimensions, as opposed to training isolated, segmented parts, may be exactly what we need.

**Summary**

Whole-body integrated movements are ideal for force mitigation.

Movements must load to unload rhythmically.

All myofascial lines are working during a total-body exercise.

Movements that are more subconscious allow for better rhythm and timing (less interference from the conscious centers of the brain).

Movements should be multidirectional and should vary in force and tempo.

Movements should have intent and create positive emotions.

Biomechanics dictate which myofascial line is being upregulated (loaded).

Movements should stay within the client's threshold to prevent unwanted stiffness and immobility.

## References

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