

# The Web of Life

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Just beneath your skin lies a complex network of connective tissue called fascia. It helps you move well, stand straight and play hard. Keeping it healthy might be one of the fastest — and most overlooked — ways to improve your health and fitness.

There's a good chance you've never heard of fascia: the stretchy, mesh-like substance that interweaves through and around your musculature, surrounds and supports your organs, and shrink-wraps your entire internal structure like a second skin.

But if you were able to peek beneath your epidermis, you'd probably be surprised to see that this messy, elastic white stuff — made of collagen fibers, and similar to the material that makes up your ligaments and tendons — is virtually *everywhere*.

Unlike muscles and bones, though, fascia has historically been given so little attention by therapists, trainers and other fitness pros that it's not even on the standard gym-wall anatomy chart.

“From an anatomical perspective, fascia is often seen as ‘the gunk you cut through to get to the good stuff,’” says corrective exercise specialist Anthony Carey, MA, owner of Function First in San Diego, Calif., and a leading fascia expert.

In recent years, however, some forward-thinking trainers and therapists have begun to recognize that this seemingly inconsequential webbing plays a far more important role in everyday functioning than was once believed.

Building on ideas outlined by anatomy teacher and bodyworker Thomas Myers in his book *Anatomy Trains: Myofascial Meridians for Manual and Movement Therapists* (Churchill Livingstone, 2009), these therapists have begun to devise ways to improve the quality and elasticity of the fascia directly through bodywork, stretches and targeted exercises.

Among these novel methods are Kinesis Myofascial Integration (KMI) — an approach to Rolfing developed by Myers — and Fascial Stretch Therapy (FST), founded by the husband and wife stretch-therapy team of Chris and Ann Frederick. These methods can significantly enhance the benefits of a stretching and strength program, making you stand taller, run faster and play harder. At the same time, fascial work often provides relief from chronic back and joint pain where many more conventional, muscle-based stretching and massage methods fail. “Everybody needs to start incorporating the fascia into their conception of the musculoskeletal system,” says Myers. To his way of thinking, however, that may mean a fairly substantial shift in the way we think about how we’re made and how we move. So if you still think “the foot bone’s connected to the ankle bone,” get ready to expand your thinking.

## FACING THE FASCIA

Anatomy textbooks will tell you that the musculoskeletal system consists of thousands of separate parts: a couple hundred bones held together by more than 600 muscles and a near-countless number of ligaments and tendons. But Myers and Carey both assert that these divisions are largely artificial, created not by nature but by an anatomist’s scalpel.

“The fascia links the entire muscular system, not just muscle to bone but muscle to *muscle*, along with all the structures in the body, like organs, ligaments and tendons,” says Carey. “Whether you’re exercising or treating pain, it doesn’t make sense to treat it like a machine with separate parts because of this head-to-toe continuity.”

Seen from this perspective, Myers contends, “You don’t have 600-some-odd muscles, as we’ve always been taught: You have a single muscle with 600-odd stopping points, all linked by the fascial web.”

Far from the haphazard mesh that the first anatomists perceived, this fascial network is now described by researchers as sensitive, dynamic and extraordinarily adaptable. “There are 10 times as many more nerve endings in your fascia as there are in your muscles,” says Myers, making

fascia far more susceptible to pain and sensation in general than your muscles are. “Most sports injuries are in fact failures of fascial structures, not muscle tissue.

“We say ‘muscles attach to bones,’” he continues, “but muscle can’t attach to anything. It’s formless, like hamburger. It’s the fascia that goes over and around and through your muscles that organizes that tissue into linear pulling machines.” When you perform a biceps curl, for example, the fascia of the biceps muscle shortens, tugging on your tendons and drawing your hand closer to your shoulder. And when you perform a quick, athletic movement — a layup in basketball, for instance — it’s the whip-fast elastic action of the fascia in your legs that transfers the force of those contracting muscles into the floor and launches you off the hardwood.

Through decades of experience as a bodyworker and an extensive study of anatomy, Myers began to notice that the fascial webbing appeared to be organized into distinct meridians, or “trains” — dense bands connecting multiple muscles and spanning multiple joints, tacked down at numerous bony “stations” along the way. If you were to think of the entire fascial network as a suit of clothing, these “anatomy trains” would be a series of elastic straps, suspenders and seams that give it structure and shape. Myers has found about a dozen of these fascial superhighways, which seem especially effective in understanding human movement and treating pain and dysfunction. Some run the length of your body, head to toe; others spiral the torso, shoot over the top of your head, and run down the middle of your back.

Like guy-wires on a well-rigged boat, a balanced, harmonious tension among these myofascial meridians helps support fluid, effortless movement. Too much chronic tension or slack in key meridians can, however, lead to poor posture and pain — and not always in the places you expect. Trace the fascial lines through the muscles and across the skeleton, and it’s possible to see, for instance, how shoulder pain might be caused by dysfunction in your opposite ankle, or how “tight hamstrings” might actually be caused by tension in the soles of the feet.

According to Myers’s model, it is through these myofascial lines, moreso than through individual muscles, that the body adapts to and reinforces alignment and movement. Says Carey, “Fascia adapts to every move you make — good, bad or indifferent.” Over time, a competitive rower, for example, might develop thicker fascia in her back and shoulders to support the repetitive movement of pulling oars. The fascia in the front of the rib cage of your typical desk jockey, on the other hand, may become thick and short to reinforce a habitually caved-in posture. And injuries, even minor ones, often result in fascial “patches” in the muscles that can cause restricted motion, leading to compensations in gait and movement. These might remain long after the injury itself has healed.

“Injured or poorly adapted fascia can start to act like glue, binding to muscles, other fascia, even your ligaments,” says Carey. In a sense, your entire individual life history — exercise habits, injuries, common sitting and sleeping positions — is written in your fascia.

Depending on these and other behavioral factors, fascial adhesions can subtly accrue over years and decades, leading to movement inhibition and sometimes chronic pain.

“Certain things in our bodies become tight, certain things become weak, and before you know it, our joints and limbs begin to make subtle twists and turns, making us a human game of Jenga,” jokes Sue Falsone, vice president of physical therapy at Athletes Performance and Team Sports in Phoenix.

## THE TANGLED WEB

So, think you might have a few kinks in your fascia? In a sense, if you’re already exercising and stretching regularly, you’re ahead of the game.

“Muscles and fascia are so interwoven that you can’t affect one without affecting the other,” says Falsone.

Nevertheless, standard, static stretching and muscle-isolating exercises, while beneficial in some ways, often have little effect on deeply ingrained fascial tension, especially if, like most people, you spend a large portion of your day sitting down.

“If we spend months, years, even decades sitting at a desk and think that a few hours in the gym per week are going to undo all that, we’re probably fooling ourselves,” says Carey. Stretching a muscle with bound-up or poorly adapted fascia is a bit like trying to stretch a knotted bungee cord: You’ll get much better results if you get the knots out first. Some of the best methods for untying these knots take a therapeutic approach, in which a practitioner works with an athlete or client on a massage-style table. Other methods have the client participate more actively, moving and stretching him- or herself in fascia-friendly patterns.

“Table work helps a client find more pliability and elasticity throughout the body,” says Carey. “Exercises help the client integrate the new range into their daily lives.” (For suggested exercises, see the Anatomy Trains at Work sidebar.)

Although KMI and FST are among the first treatments to fully integrate Myers’s anatomy-trains concept into their methodology, other treatments have had measurable impact on the suppleness of the fascia, including active release therapy, resistance flexibility and strength training, and even self-myofascial release with foam rollers and other implements. As Myers’s research gains wider recognition, it’s likely that massage therapists, bodyworkers and trainers in other fields — from yoga to Feldenkrais — may well begin to emphasize fascial relationships in their teachings as well. (For more on Feldenkrais, read “The Feldenkrais Fix.”)

Myers’s KMI approach, which builds on the Structural Integration model developed by Ida Rolf (of Rolfing fame), takes the form of about 12 structured, progressive hands-on sessions with a KMI-certified practitioner. (Find one in your area at [www.anatomytrains.com/kmi/practitioners](http://www.anatomytrains.com/kmi/practitioners).)

Initially, the practitioner takes photos and makes detailed observations about the client’s carriage and posture, noting especially where his or her fascial meridians appear shortened or contracted. From that point, each session focuses on a specific area of the body, starting with more superficial muscles, working gradually inward toward the core as the

sequence progresses, and, finally, incorporating fully integrated movement.

Throughout the treatment, the practitioner manually works out the fibrotic knots and scarring in the fascial tissues, restoring balance among the meridians by applying direct, sometimes fairly intense, pressure directly along the affected fascial lines. Although treatment can be painful at times, the results often feel terrific. Many people report marked improvements in everyday activities like sitting and standing, and even more impressive strides in active pursuits.

## FLEXIBILITY RECLAIMED

Forty-seven-year-old Nancy Di Benedetti, from Calgary, Alberta, began her KMI treatments with therapist Nadine Samila with the goal of touching her toes. “After the first session I was already walking differently. And after 12 sessions not only was I able to touch my toes, but I actually started skiing again,” she says.

Chris and Ann Frederick bring to bear many of Myers’s principles in their Fascial Stretch Therapy (FST) system, which takes an unusually gentle approach to athletic flexibility training. “When you stretch too quickly or intensely, as many athletes do, the muscles go into a protective mode, contracting and resisting,” says Ann. “To get around these protective mechanisms, you’ve got to romance — not attack — the nervous system for optimal results. If the client is in a relaxed, calm state, his or her muscles and connective tissue will be much more responsive to the work. So you can’t yank on a muscle or deliberately push past a person’s comfort zone.”

In practice, FST can be almost dancelike, as the practitioner slowly and rhythmically moves the client’s limbs in a series of slowly expanding arcs.

These gentle, oscillating movements can elicit a soothing, parasympathetic response from the client’s nervous system, much like rocking in a chair or swinging in a hammock. “I never push the joints to their limits. I just gently test the boundaries of what’s possible for them at that moment,” says Carey. “A rhythmic tempo lowers apprehension,

allowing the trainer to get past resistance in the fascia and into the muscles themselves.”

This calm state also primes the client for learning new movement patterns, while at the same time, the broad, multidimensional movements stretch the entire fascial fabric in ways that conventional, single-plane stretching and many other types of therapy don't.

“I once worked on an insurance executive who had knee pain from years of high school and college athletics. His doctors were at a loss because the joints themselves seemed fine,” says Chris Frederick. “Through soft-tissue work and some well-chosen stretches, I was able to create space in his hip joints and relax the tension in his hip flexors, which took the pressure off his knees. And the pain he had had for 10 years was gone.”

Frederick emphasizes that treating the whole person — rather than a single symptom or a single part of the body — can often mean paying attention to issues farther up and down the various meridian lines from the site of pain or dysfunction: “Where there's pain,” he says, “ain't usually where the problem is.”

## DIY ANATOMY TRAINS

Although working with a qualified therapist is the best way to deal with acute problems in the fascia, smart exercise choices involving the fascia can also help address some imbalances.

One very effective option is to focus on full-body movements like Olympic lifts (and their regressions) and medicine-ball throws. Working with implements like battling ropes, Indian clubs and kettlebells, rather than trying to build or work different body parts in isolation, can also be helpful. Many of these movements require a dynamic transfer of force from the ground, through the body, and out through the arms or hands, in a pattern that simulates a wave. Done correctly, these wavelike motions parallel the sequential, muscle-to-muscle transfer of force that occurs along the fascial meridians just below the skin. As a result, they help reinforce healthy, integrated relationships among the myofascial meridians.

You can approach flexibility training with a similar mindset: Rather than stretching one muscle group at a time, think about stretching an entire plane of the body at once, and of long movements that extend and spiral the body head to toe.

Myers recommends stretching in *multiple* planes, adding rotation of the feet to a toe-touching stretch, for example, in order to more fully stretch the fascia across the hamstrings, calves and lower back. The asanas in yoga and the gentle oscillations of Feldenkrais are good examples of fascia-releasing work that helps enhance flexibility. (For more specific exercise and stretching choices, see the “Anatomy Trains at Work,” sidebar.)

For greater suppleness throughout the fascial network, Myers also encourages people to incorporate bouncing of some kind in their workouts: skipping rope, jogging, jumping on a trampoline. “You lose elasticity in your fascia as you age. Kids exemplify that bouncy elasticity in their fascia, and bouncing helps you hold on to what you have.”

Variety, however, may be your best safeguard against tightness and adhesions in the fascia, notes Myers: “If there’s one thing I could say to people who wanted to get fit or stay fit, it would be ‘Stop repeating yourself!’”

Repetitive physical action — including forms of exercise like running or cycling — can leave its mark on the fascia, unnaturally tightening certain areas and eventually leaving you more susceptible to injury. The take-home lesson? Mix things up. Hike or cycle on uneven terrain, switch strength-training exercises frequently, and seek out new ways to move, through dance, sports, martial arts or other activities.

For some time now, progressive fitness professionals have been emphasizing integrated forms of exercise, from dynamic flexibility work to full-body strength training to outdoor exercise and Eastern-style movement. In a sense, the anatomy-trains model represents the anatomical basis for this approach: Just as the fascia links the muscles together in interconnected chains, so integrated exercise and movement

link the muscles functionally, through dynamic, coordinated movement patterns.

In all likelihood, the more we can shift our perspective to see the body that way — as a whole system working together — the healthier we'll be.

## ANATOMY TRAINS AT WORK

To experience the interconnectedness of your own fascial webbing, try some of the following exercises, and consider building similar moves into your workouts. Activities that include long, sweeping patterns, full extension of the limbs, and spiraling gestures through the torso (notably yoga, tai chi and Feldenkrais) can enhance awareness and foster optimum balance of your body's major fascial lines. Many types of dance as well as racquet and ball sports, which require jumping, leaping, throwing and reaching, also have similar benefits.

"The World's Greatest Stretch"

- Stand and step forward with your left foot into a deep lunge position.
- Lean forward and place both hands on the floor, with your left knee outside your left arm and shoulder.
- Keeping your right leg straight and your back long (aim for a perfect line between your head and right heel), gently press your left elbow against the inside of your left knee for a two-count.
- Still keeping your right leg fully extended, slowly straighten your left leg as much as possible, rocking your weight back onto the heel of your front foot. Hold for a two-count.
- Rebend your left knee and lift your torso from the bent-over position, assuming a standing lunge position with your right knee floating 2 inches off the floor. Hold for a two-count, then step forward with your right foot and repeat on the opposite side.
- Perform six to eight repetitions on each side.

“The World’s Greatest Stretch,” recommended by Sue Falsone, vice president of physical therapy at Athletics Performance and Team Sports in Phoenix, mobilizes both front-of-the-hip and back fascial lines in their entirety, head to toe.

### Side Bend with Rolling Feet

- Stand upright with your feet parallel and about shoulder-width-and-a-half apart.
- Keeping your hips and shoulders square, reach your right hand directly overhead.
- Perform a side-bend to your left, reaching your right arm over your head and as far to your left as possible.
- Once in this position, roll both feet to the right, shifting your weight onto the outside edge of your right foot, and the inside edge of your left foot. Hold for 10 seconds and repeat on the opposite side.

Although the standard side bend is traditionally seen as a stretch for the lats and obliques (the muscles on the sides of your torso), rolling the feet in this position — which inevitably intensifies the stretch — makes it clear that you are in fact extending a unified fascial line that extends along the side of the body from the outside edges of your feet all the way up to your ear.

### A Better Hip Mobilization

- Lie flat on your back on a firm surface. Bend both knees with feet flat on the floor.
- Lift your right leg in the air.
- Take hold of your leg with both hands — behind your knee, on the outsides of your thigh, or wherever feels comfortable.
- Keeping your neck relaxed and your head on the floor, gently pull your leg toward your upper body until you feel a gentle stretch.
- Maintaining your hold on the leg, gently rotate your foot, circling your leg to the outside, then to the inside of your torso.

- Continue to experiment with easy movements of your leg in whatever range and plane of motion feels comfortable for about two minutes, then repeat on the other side.

Many people stretch their hips and hamstrings in one plane of motion: generally straight forward (as in, touch your toes). Since the fascia runs through and around the entire musculature, it can be more thorough to stretch in this multiplanar way: up, down, forward, back. And, avoiding the pain threshold can be more effective because you fly beneath the radar of the protective mechanisms of the joints, which tighten and shorten muscles when you stretch forcefully.

## SNUFFING OUT FASCIAL INFLAMMATION

Long-term inflammation and irritation in the fascia — the intricate web of connective tissue that holds your body together — is fairly common, and can sometimes aggravate and make worse certain arthritic conditions.

What causes fascial inflammation? “No one knows for sure. It’s partly genetic, but it’s often related to overdoing one particular type of movement,” says Nadine Samila, a practitioner of Kinesis Myofascial Integration (KMI) and Myofascial Release Therapy (MRT) from Calgary, Alberta.

Inflammation and tightness in the iliotibial, or “IT,” band (the thick fascial strap that runs along the outside of your thigh), for example, is common in avid runners. “A tight IT band can pull the kneecap off its track, which irritates the knee joint and can eventually lead to arthritis,” says Chris Frederick, PT, coauthor of *Stretch to Win* (Human Kinetics, 2006).

Similarly, habitual slumping and slouching can cause the fascia in the front of the chest to shorten and tighten, restricting freedom of movement in the arms and shoulders. Desk-sitters, for example, will often be unable to reach behind themselves comfortably from a seated position because the fascia in and around their pectoral muscles is so short and tight. As a result, the smaller, weaker muscles of the rotator cuff can get strained or injured, even during seemingly harmless

movements. “I’ve had clients who have torn their rotator cuffs trying to reach something in the back seat of their car,” says Frederick.

Perhaps the worst-case scenario of fascial inflammation is called compartment syndrome, which is a restriction of the fascia surrounding the muscles of the lower leg. It often occurs in seriously overtrained athletes and exercisers. Let this condition go on too long, says Frederick, “and you could even lose your leg.”

But it’s plain old inactivity that causes the most fascial troubles. Healthy fascia is well hydrated and smooth, like the fine membrane that covers fresh, uncooked chicken. But the connective tissue in older and inactive people, explains Samila, “gets fuzzy and sticky, like cobwebs. It doesn’t move well. That’s partly due to age, but inactivity makes it much worse. We just don’t move enough!”

The antidote? Move. As much as you can, and in as many different ways. “The more you move, and the more ways that you move,” says Samila, “the more you keep the fascia soft, hydrated, and healthy.”

## TENNIS BALL TRICK

- Perform a standing toe-touch in bare feet, with your knees soft, and note how far down your legs you can comfortably reach without straining.
- Stand, and carefully roll the bottom of your right foot over a tennis ball, paying particular attention to spots where your feet are tender or sensitive. Hold on to something stable for balance if necessary. Continue for at least a full minute, then repeat on the left foot.
- Perform the standing toe-touch test again.

Fascia Facts: After a quick foot massage, many people will feel as though their hamstrings suddenly got looser. The hamstrings are affected as the tennis ball helps loosen the Superficial Back Line as a whole, a fascial train that runs from the bottoms of your feet to your head, allowing many people to reach further on their second try.