Moving Beyond Muscle

Kevin J. Kula asks why CrossFitters use muscle-based soft-tissue therapies. For chronic problems, he says fascially-based therapies are the solution.

CrossFitters demand more from their exercise program than the average gym rat schooled in the outdated exercise science of the biceps and leg curls. Why, then, do we have exercise standards consisting of high-level gymnastics movements and Olympic weightlifting while relying on outdated muscle-based therapies like trigger-point therapy and deep-tissue massage?
Individuals partaking in an exercise program like CrossFit can benefit from understanding the difference not only between isolation exercises and functional movements, but also between muscle-based therapies and those that address the body globally in a functional way.

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The poor flexibility and orthopedic imbalances many CrossFitters display aren't a result of CrossFit—as some contend—but from poor work posture and old injuries. While movement patterns improve with CrossFit, it is my own experience from coaching athletes, teaching self-care and providing soft-tissue work to CrossFitters that some of these imbalances do not just go away with CrossFit but are chronic and continue to limit performance. It is these chronic restrictions that muscle-based therapies fail to resolve and only are addressed with a fascially-based approach like structural integration, or SI.

**The Problem: Muscle-Based Kinesiology**

The basis for personal-training programs, physical therapy, athletic training and massage therapy is muscle-based kinesiology. In traditional anatomy/kinesiology, the skeletal system is taught first. Then the muscles are learned from origin to insertion (where they attach to bone). Movements are taught from this understanding of how each muscle individually operates. Each muscle acts as a lever directing the bones through a certain range of motion. The problem with this logic is muscles are being conceptualized as isolated structures in the body. Muscles do not exist independently in the body; they are distinctions an anatomist creates with a scalpel. True muscle function then needs to be studied from a viewpoint that looks at the body as an integrated whole.

Massage therapists are taught to treat muscles in a variety of ways, often focusing on trigger points, which are contracted spots in the muscle bellies. In massage, lotion is applied so that the therapist’s hand, knuckle or elbow can glide over the body’s skin/muscle. In a deep-tissue massage, the therapist’s elbow glides across the length of the muscle while applying pressure at a deeper level. This can be compared with a car’s wheels hydroplaning over the road; the tires are not actually in contact with the road but with a thin layer of water. Fascially-based therapies, on the other hand, require the tissue be “hooked” so traction—like the tire gripping the road—can be applied. By first sinking into or hooking the tissue with an elbow and then scooping (lifting or dropping) the tissue in a specific direction, the layers of tissue in the body are able to regain their sliding motion on one another, improving hydration and pliability.

Active release technique, or ART, is one of the highest level soft-tissue therapies I have encountered but is mostly muscle-based. ART grew out of the chiropractic community due to the need for soft-tissue training for chiropractors and is very detailed and constantly evolving. But the nature of chiropractic scheduling makes this therapy merely a very effective pain-reduction approach. I first heard about ART from Brian MacKenzie of CrossFit Endurance. I went through the training, and I found success with some clients (treating their symptoms) and more limited success with others.

**SI … treats the whole body, correcting the source of the problem, not the symptoms.**

ART primarily uses pin-and-stretch techniques and is generally focused on a particular problem. For example, a person with plantar fasciitis would be treated by having the tissue on the bottom of his or her foot pinned down with the therapist’s thumb while the person moves the toes up and down. This therapy does help remove fascial restrictions, as does some types of massage, such as myofascial release.
SI, on the other hand, treats the whole body, correcting the source of the problem, not the symptoms. It is worth noting that many holistic therapies operate from a symptom-based philosophy using natural solutions but relying on the same logic as our current medical system. Massage therapists, for example, spend a lot of time treating the neck and shoulders, which are often symptomatic due to other factors in the body. ART and high-level massage are effective for continuous maintenance, but the focus of this article is more profound.

What if, through corrective structural work, the body was better aligned? What if maintenance work was minimized and chronic pain eliminated? The body’s ready state would enable you to exponentially increase your level of fitness through CrossFit.

**Structural Integration**

Last year, I was fortunate to work with Luke Kayyem, co-owner of CrossFit Scottsdale. I took Luke, an incredible athlete and Games competitor, through a 12-session series of SI. When I approached him, he asked me, “How is structural integration different from ART or deep-tissue massage?” I told him it’s like trading in your car for a Ferrari instead of putting rims on your broken-down Chevy. SI rebalances the entire body, not just focusing on tight areas or localized pain, ensuring long-term results and optimal performance, rather than just maintenance. To see an example of this, I have included my before and after pictures from my training.

Below is a great example of the poor alignment I had before undergoing SI. The photo on the left was taken before I received any work, and the photo on the right was taken after a series of 12 weekly 90-minute sessions. You can see how this drastic imbalance (left shift of the rib cage) limited overhead mobility. I was also easily fatigued after workouts, limited in breathing and very tight in the shoulders and lats.

In the second photo, you can see the greater support going up the legs and much improved alignment above. My spinal curvature also changed for the better (confirmed through X-rays). The centered rib cage, level clavicles and relaxed arms made for a much better Fran time.

![Before and after 12 sessions of structural integration. Major imbalances in left photo: Left rib cage shift relative to pelvis; right-shift neck relative to rib cage; right-tilt neck relative to rib cage; right-tilt shoulder girdle relative to rib cage (left shoulder higher); X-leg pattern in lower (knock knees); tensional bowstring in arms.](image-url)

Courtesy of Kevin J. Kula
To get a sense of my old pattern, stand up, and without moving your head or neck, shift your rib cage to the left. Now, tilt your head to the right and raise your left shoulder. Now try doing a shoulder press. How does that feel? No matter how well you get set for the movement—elbows forward of the bar, sternum down, chin tucked—the movement is going to be limited. In my case, I became very strong around my imbalances before plateauing in my work capacity.

“If your symptoms get better, that’s your tough luck.”
—Ida Rolf

“Your body will find ways to compensate for any imbalances. That can create inefficient movement patterns and limit performance,” Dr. John Zimmer convincingly states in his October 2010 CrossFit Journal article Sub-Failure Injury.

The intention of SI is not directed by the source of the pain but informed by realigning the entire body, creating support. This produces better movement, flexibility and overall energy and endurance. When someone comes into my office, I listen to his or her complaints and note the site of pain. But I am more interested in the overall alignment of the body.

“If your symptoms get better, that’s your tough luck,” said Ida Rolf, the founder of SI, meaning the problem will often self-correct when the body’s inherent stability is supported through proper alignment.

I start with a standing assessment and look for rotations, shifts, tilts and bends. I then take into account how this lack of alignment is contributing to pain. Jon, who came to me with neck/shoulder pain, presented the following imbalances as seen in the left photo on this page.

The photo on the right was taken after Jon received three sessions of SI. To eliminate the strain on the neck and shoulders, I had to rebalance the rib cage over the pelvis, eliminating the posterior tilt. Notice in the first photo how the forward neck is associated with the tilted rib cage. By getting the rib cage more vertical—think of the top of the rib cage coming forward and the bottom shifting back—I was able to create better support for the shoulder girdle and the neck. I then rebalanced the shoulder girdle, eliminating the strong anterior tilt of the scapula tilting forward on the rib cage.
I can describe what I did in a muscular way—activated the overstretched deep-neck flexors, lengthened pec minor and serratus anterior—but to get an idea of the global configuration of Jon’s pattern, looking at the fascial bowstring, or outline, of his entire body is useful.

The posterior tilt of the rib cage in the upper body is a common compensation of an anterior shift in the lower body. Notice the head of his femur is forward of his heel, the weight falling more on the ball of the foot. Upper-body imbalance often affects the lower body, and vice versa. It doesn’t matter what caused the imbalance; the relationships between the contributing elements need to be addressed. Stand up and try rocking forward on the balls of your feet until you almost fall forward. Now tilt your rib cage back and notice how this displaces the center of gravity backward. As the rib cage tilts back, feel how your head wants to come forward. Imagine being stuck in that pattern.

Now you can understand that to fully address Jon’s neck complaint, I also had to lessen the anterior shift of his pelvis, which was supporting the pattern of the posterior rib cage. Looking at the second photo, you can see the changes best by again looking at this outline of the entire body: the lower shift has lessened, the rib cage straightened and the neck and shoulders are better supported.

No other therapy specializes in addressing the whole body. There is a place for a focused lens, but the alignment of the body needs to be examined. In this way we can look at optimizing posture and movement relative to that person and his or her lifestyle. Problems arise when every professional hammer treats every client’s problem as a nail; chiropractic focusing on the spine, massage on the muscles and physical therapy on the joints. SI, in a sense, is the Western counterpart to Chinese medicine, using a wide-angle lens and looking at the person as fluid and adaptable. I often have to adapt my original strategy based on how the person responds. It is important to note I am not just looking for ideal posture in a standing position. I am looking for fluid and adaptable movement that comes from the core.

**Who Benefits From SI?**

Anyone with the following can be helped by SI treatment:

- Fallen or lifted arches/foot immobility.
- Strong pelvic tilt/chronically tight hamstrings.
- Excessive or insufficient lumbar curve.
- Recurring plantar fasciitis or ITB syndrome.
- Scar tissue and prior surgery.
- Poor posture and restricted breathing.
- Forward head posture/chronic neck or shoulder tension.
- Range-of-motion/flexibility limitations.
- Movement imbalances and plateaued fitness.
- Unresolved complaints after seeing other health professionals.

**Understanding SI**

**The ABCs of SI**

The events of your life have shaped your body over time. How your body feels and functions is affected by old injuries, poor posture, immobility and stiffness. Over time, these limitations create compensations in the body that seem normal and unavoidable. Pain is merely the symptom of these imbalances.

SI improves your body’s alignment, which improves posture, range of motion and flexibility. The symptoms of these chronic imbalances—neck, shoulder and low-back pain—will be permanently resolved once balance is restored.

These lasting changes will improve your energy, movement and body awareness—all of which will empower you to return to the active lifestyle you want to live.
The Sessions

SI always is done in a series of sessions, ranging from 10 to 12, depending on the school the practitioner attended. Sessions range from 60 to 90 minutes and are generally once a week.

Some structural integrators offer an intensive three-session series as a starting point. The first session addresses the lower body: creating support through the arches of the feet and freeing the pelvis from shifts, tilts or rotations.

The second session looks at the relation of the rib cage to the pelvis, the shoulder girdle and breathing. The third session focuses on the neck and spine, tying everything together—integrating movement with body alignment—once support in the lower body is created.

Trigger points often resolve on their own—minus all the pain—when the fascial covering of the affected muscle and surrounding layer is rebalanced.

The sessions consist of long, slow massage strokes that create space in the body and bring length to short and tight muscles and connective tissue. Directed ankle, knee, hip and shoulder movements help to free restrictions, resulting in a feeling of freedom and openness. On the left is an in-class photo of me going through SI.

The Strategy and Technique

Restrictions are often between muscles or muscle groups. “The goal is to get surfaces to slide on one another,” Kelly Starrett said.

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To give an example of the techniques involved in SI, I will focus on the arches of the feet. Many people ask if the changes hold over time and how permanent changes are possible. Another important question is, “How is the body able to quickly adapt to the work in some people yet take much more time in others?” I will address these questions from a kinesis myofascial integration (KMI) perspective. KMI is the school for SI that I attended, it was founded by Tom Myers, author of the book Anatomy Trains.
Myers points out there are three components that hold the arch in place: the shape of the bones, the plantar ligament/muscles and the upward pull from the lower leg myofascculature (muscles, tendons and fascia). He explains that the arches are pulled into existence through walking and running. The foot has three arches that form an upside-down triangle when traced on the bottom. Take your finger and trace the bone under the big toe (left foot) to the bone under the little toe (covering the ball of the foot). This is the transverse arch. Now take your finger down to the heel, this is the lateral longitudinal arch. Lastly, take your finger from your heel back to the bone under the big toe to complete the triangle; this is the medial longitudinal arch.

If a client has fallen arches (medially tilted or collapsed medial arch), I will examine the musculature itself as well as the relationship of pelvic tilt to the arches. For the sake of simplicity, I will look at the strategy and techniques for the lower leg. Keep in mind that a posteriorly tilted pelvis (possibly due to short hamstrings) will affect my strategy differently than an anteriorly tilted pelvis. There are multiple patterns as the pelvis itself can be tilted relative to the femur but also anteriorly shifted relative to the feet.

After doing my visual assessment, I observe the client has fallen (medially tilted) arches with an anteriorly tilted pelvis. She wears custom orthotics to raise the medial arch. Here is how the first five sessions would affect the arches specifically. Keep in mind that there is no recipe based on what imbalance is seen or what restriction is felt. Everyone’s restrictions differ and need to be addressed accordingly; there is no standard recipe. In the 12-session series, the first four sessions address the superficial layers of muscles and fascia: pec major/abdominals, quads/hamstrings/IT band, tibialis anterior/calves. The next four sessions address the core: tibialis posterior, adductors, pelvic floor, QL, diaphragm and deep neck flexors. The last four sessions (integration sessions) are critical to long-term success, helping the person integrate alignment and movement.

Session 1: Superficial Front Line

On a superficial level, I would start by freeing up the crural fascia that is a connective-tissue-like sock of the lower leg and is similar to the fascia lata (covering) of the thigh. This is accomplished by sinking the flat of my knuckles into the lower leg (hooking the tissue) before “scooping” the layer upward while the client moves the ankle up and down. The movement itself helps to mobilize the layer while reinforcing proper movement throughout the ankle. This often-used method of scooping the superficial layer is why no lotion is used.

Think of this connective-tissue layer functioning like the pork or lamb casing used to hold together the contents of a sausage. Before addressing the inside layers, the outer layers are loosened. The muscles of the lower leg are separated by connective tissue, similar to how the segments of an orange are individually wrapped.

I also would free up the ankle retinaculum that holds down the tendons of the lower leg. I would ensure the connective-tissue layer is allowing the tendons to glide underneath. This is a big factor in ankle mobility; ankle dorsiflexion is crucial to a good squat. I would then hook tibialis anterior (the muscle on the front of the lower leg) with the flat of my knuckles. By lifting the tissue superiorly while the client moves the ankle up and down, I would help lift this component of support for the medial arch. Tibialis anterior has a central tendon and is a very deep muscle that often gets adhered to the layer underneath. Part of lifting the muscle superiorly involves this freeing of the muscle from the deep layer. The territory of this session would guide me to continue to lift the entire front line from foot to hip (possibly lifting rectus femoris as well).
Session 2: Superficial Back Line

I might begin by lengthening the tissue associated with the transverse, medial and lateral arches. I would then lengthen the plantar fascia with the intention of creating a suppler and more supportive bottom of the foot. I would also hook the soleus (calf muscle) and pull it away from the deeper connective tissue layer while I drop it inferiorly toward the ankle. This is one technique that helps create more space at the heel (behind the ankle). CrossFitters who shift forward to the balls of their feet during the squat often lack the ability to ground the heel. The work in the front and back of the lower leg in the first two sessions really helps with ankle dorsiflexion in the squat.

Sessions 3 and 4: Lateral and Spiral Lines

The tendons of the tibialis anterior and the fibularis longus (lateral line) connect under the bottom of the foot, creating a sling that bridles the ankle. Sitting in a chair, place your right foot flat on the floor and lift the inside of the foot off the floor (supination). Now lower the inside and take your right hand and lift the outside of your foot (pronation). Can you see how if the muscle on the outside (fibularis longus) was pulled up, it would collapse the arch medially? Rock your ankle to the left and to the right (toes should stay forward pointed) and notice how the pull from the muscle above tenses the foot. Whereas the superficial front line (tibialis anterior) is raised to try and support the arch, fibularis longus (outside leg muscle) is freed from the surrounding layers and then dropped in Session 3.

To get a sense of the spiral line, step on a jump rope with your right foot and hold the handles taut next to your right hip. The spiral line forms a sling from the foot to the hip and has a significant effect on the arches (as mentioned) and pelvic tilt. By pulling on one handle you can see the connection between the pelvis and hip. The spiral line is often responsible for superficial rotations in the body, rotations that often counter deeper rotations. Many body workers treat the psoas (one of the deep hip flexors) and deep work that affects the connective tissue between and surrounding the bones. This work is very different than deep-tissue massage or other therapies that might just be compressing muscle tissue. Two-handed pressure (above and below) is used with the intention of working deeply.

SI: After the Series

The cumulative effect of these sessions would be to build the arch from foot to hip, creating more support and stability each session. Once the body has enough support (lower leg myofasculature, especially) the arches can maintain themselves. Some of my clients gradually transition to minimal footwear, helping to strengthen the connective tissue of the lower leg that supports the arch. Some people have more of the lines involved and more restrictions, so they take longer to change; other people have greater awareness that helps to support the change.

Assuming the person does not engage in a behavior that puts the body back into the compromised position, the body does not regress over time. It continues to strengthen and develop into its new pattern. The client needs to commit to the process and trust in the work while doing his or her own part to change patterns. CrossFit is the perfect complement to SI, helping to develop and heighten global movement patterns.

Resources

Fascial Stretch Therapy

The other major fascially-based therapy that is emerging is called “fascial stretch therapy,” or FST. CrossFit coaches can become certified through workshops offered globally by Ann and Chris Frederick of Stretch to Win.

FST uses tractioning, fascially based stretching and contract-relax and works with breath, tuning the nervous system. The Fredericks book Stretch to Win is a great resource for trainers and for self-stretching. Chris Frederick, physical therapist, structural integrator, dancer/martial artist, reminds me of Starrett in his innovative methods and cutting-edge philosophy. Ann Frederick is one of the most gifted body workers I have ever encountered. She transmits her skill and touch directly. At their workshops, you learn “feel” and “presence”—something that takes years in different manipulative fields.
Muscle ... (continued)

Fascial Anatomy: Tom Myers and the Anatomy Trains

For years, the medical community that named the muscles in medical textbooks we reference today discarded the body’s connective tissue that wraps, connects, separates and protects the body’s structures. The resulting anatomy that early anatomists created has been very helpful and is not wrong but simplistic. People like Myers have been arguing for years that muscles and ligaments are not separate; the distinction is created artificially with a sideways scalpel. He has revolutionized anatomy and manual and movement therapy with his concept of anatomy trains.

What are Anatomy Trains?

We have four cardinal lines: front, back and two lateral lines. We can zoom in and look at muscles or use the anatomy trains concept to take a wide-angle-lens view.

The IT band is part of the lateral line. Its role is largely to help stabilize and lend support to the front (quads) and back (hamstrings) lines, while opposing the deep front line (adductors). People who have been saying “it’s all connected” now have a basis for evaluation and treatment and a common language that can be used across professions. The anatomy trains explain fascial continuities (connectedness of muscles, tendons and fascia) in the body. This creates a framework for assessing shifts, tilts, bends and rotations in the body.

The superficial back line, for example, originates at the bottom of the foot, continues via the Achilles tendon up the calf muscles, then the hamstrings, only to connect to the long ropy erector spinae muscles of the back through the sacrotuberous ligament. This longitudinal fascial line ends at the back of the neck, is stretched in a down dog, and its restrictions vary—for example, having to bend your knees to pick up your keys.

Anatomy Trains Short Courses

Manual/movement therapists can hugely benefit their clients by understanding how to body read, assess and apply fascial techniques—even in a limited way through workshops. The range of practitioners studying SI varies widely. My classmates included physical therapists, yoga/Pilates teachers, ART/massage practitioners, acupuncturists, shiatsu/Thai massage practitioners, strength and conditioning coaches, visceral manipulators and cranio-sacral therapists. Information about a wide variety of courses also is available through the Anatomy Trains website. Myers offers many short courses through his website. To learn more about fascial anatomy, strategy and technique, consult his books *Anatomy Trains, Body3: A Therapist’s Anatomy Reader* and *Fascial Release for Structural Balance*.

Fascial Fitness Courses

Fascia’s role in movement has been largely ignored for years. Myers and Robert Schleip are pioneers and have recently created a new term, “fascial fitness,” that looks at the role of the connective tissue in movement. People wearing Vibram FiveFingers, for example, are strengthening not just the muscles but also the connective tissue in the lower leg and ankle, which current research shows takes 18 months to accomplish. Integral CrossFit in Boulder, Colo., is the first affiliate I know of that is hosting a fascial fitness course.

To SI practitioners, it doesn't make sense to treat the body as a isolated parts.
Muscle ... (continued)

SI

There are at least 12 main SI schools in the United States and many worldwide. The International Association of Structural Integrators is the main organization, and its website has information about the various schools and profession.

Maintenance vs. Optimization

CrossFit is constantly evolving. The level of training staff, trainers, athletes and the whole community is exponentially growing. The importance of mobility and recovery has recently been elevated in the community as Starrett has provided an invaluable resource in the MobilityWOD and in his Movement and Mobility Seminar.

While MobilityWOD helps correct structural imbalances, there is a difference between high-level maintenance and corrective/structural work with a professional. Depending on the level of misalignment, some people might find maintenance sufficient, while other people might benefit from structural (fascially oriented) work.

Self-Assessment Exercise

Try this exercise: Look in the mirror and notice if your shoulders are level. Is your head tilted to one side? Do your arms hang at about the same distance from your rib cage on both sides? Take a big breath in and notice where breathing is restricted. Are your sides expanding/ribs flaring out to allow for breath? Looking at the side of your body, determine if your hip is centered over the foot. Is your hip shifted forward, moving the weight onto the balls of your feet?

Close your eyes and notice where your weight falls. Is it evenly distributed across both feet or is your weight on the front of one foot and back of the other? These exercises will help determine the level of alignment, what areas to address and if more extensive work is needed.

Just as CrossFit and our understanding of exercise continue to evolve, so will the understanding of complementary therapies.

An All-Inclusive View

Daniel Christie’s explanation of neuromuscular therapy/myoskeletal alignment techniques and Christian Lemburg’s description of pain referral are both highly valuable resources. Almost everyone can attest to the benefits of massage, neuromuscular therapy and active release. There is no question that those methods are valuable. These advanced practitioners are especially beneficial to CrossFitters.

However, we must acknowledge limitations in certain approaches, recognize the role of fascially based methods and learn how to use innovative new therapies. Getting a series of SI sessions will enable more effective integration of other soft-tissue methods and more effective maintenance work, and it will unquestionably increase work capacity/fitness.

In March 2012 I will be attending The Third Annual Fascial Research Conference in Vancouver, Canada, where scientists and practitioners from all over the world will be getting together to discuss how the latest fascial research affects treatment strategies. Future research will help all soft-tissue practitioners better understand how they can work together, incorporating and integrating their methods. Just as CrossFit and our understanding of exercise continue to evolve, so will the understanding of complementary therapies.
CrossFit and SI

I am reminded of Greg Glassman when I hear the following Rolf quote, "When I started this work, there was no 'book.' There was no law and there were no prophets. And still there is very little law, and there are even fewer prophets. You have to stop and experiment, and the law and the prophets come out of what the experiment shows. When we experiment with bodies working in the same way, the same pattern shows the same map.”

My passion for CrossFit motivated me to become a trainer and coach. It was my clients' passion for CrossFit and their dedication to exploring their own potential that inspired me to pursue methods of becoming a better coach. That journey led me to SI. I share my knowledge and experience in hopes there will be future dialogue between the innovative and passionate members of the CrossFit community and those of the SI community. Together, we can help evoke human potential, forging elite fitness by moving beyond muscle.

About the Author

Kevin J. Kula is the owner of Ready State Fitness, a Phoenix-based business that offers KMI Structural Integration, Fascial Stretch Therapy and Paleo nutrition. Kula has attended five CrossFit seminars: Level 1, Gymnastics, Running/Endurance, Nutrition, and Movement and Mobility. He lectures about the Paleo diet at Whole Foods, is part of the Phoenix Paleo Meetup Group and plans to complete a functional medicine program next year through Functional Medicine Town. He also conducts stretching and movement workshops and is writing several e-books about nutrition and stretching. Kula can be reached at kevin@readystatefitness.com.