Yoga and Fascia

Jon Burras

has been around for a few thousand years. Within this discipline we have come to understand ourselves from a spiritual perspective. For many, yoga has become a belief system and a way of understanding the body and the world in which we live.

Science is a relatively new way of perceiving our world, a rational and analytical way of thinking that is only a few hundred years old. While similar in many respects, yoga and science offer very different views of the body. Science offers us the perspective of soft and hard tissue, physical entities; yoga, lines of energy and the concept of Chi. The goal of science has been to dissect us into many parts. Yoga's strength is to bring us back to wholeness. Combined together, both viewpoints give us more insight than either one individually and enhance our ability to understand ourselves.

What science has brought us.

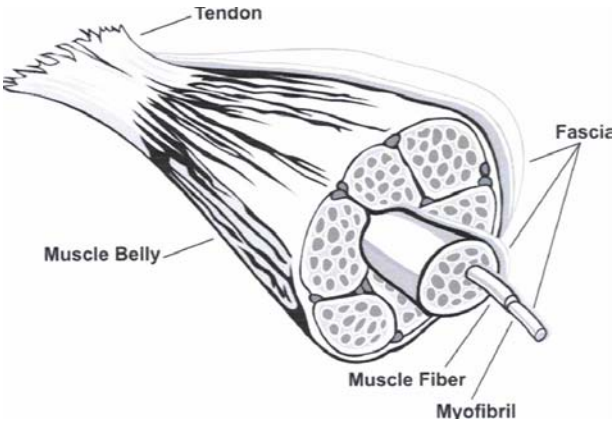
Within the body there are four different types of cells. These cells are the following; epitheleal, muscle, nerve, and connective tissue. (Epitheleal cells are cells that flake off, like in the stomach lining or in the mouth or skin.) Connective tissue cells appear in many shapes and sizes. Bone is a form of connective tissue, so are cartilage and the membranes around red blood cells. Fascia and tendons are also forms of connective tissue. While it may take on many forms, the distinguishing characteristic of all of connective tissue is that it a gelatin-based substance containing cells and fibers.

For instance, bone is made of this gelatin-based substance, called *ground substance* or *matrix*. There are mineral deposits, primarily calcium, within this gelatin to give bone its hardness. Bone also has some cells and many fibers, the majority being collagen fibers. Consequently bone is very dense and hard. Blood and lymph, also forms of connective tissue, have many cells and few fibers within their matrix, which creates a more fluid form than that of bone. This ratio of cells to fiber and the density of ground substance are key factors in the type of connective tissue. Each type of connective tissue is like a jello salad. The basic ingredient is a liquid and the remaining ingredients help to determine the final outcome.

Fascia, sometimes called connective tissue proper, consists of this gelatin matrix and cells along with many collagen fibers for strength (white fibers) and elastin fibers for flexibility (yellow fibers).

Fascia has many functions within our bodies. One of the most obvious is to serve as a container, a boundary for the liquid in our body; without it, we would leak out all over the place. Think of an orange - when it is sliced in half you see quite a bit of white material. Each slice is compartmentalized by white fibers. In addition, each tiny sack of juice is surrounded by more fascia to keep the liquid from draining out. Fascia does the same thing in our bodies. Every cell is compartmentalized by fascia. A heart or a brain needs to have a container to hold it in place. As an embryo develops, its cells continue to grow and multiply and are held in place due to the containment properties of fascia

Fascia anchors our intestines to our rib cage. Fascial membranes anchor the brain to the skull to minimize movement. Fascia encapsulates every bone and organ: fascia that wraps around the heart is called the pericardium; that which covers bone, the periosteum. The fascia that covers muscle tissue is called perimysium. Fascia wraps around every muscle belly, muscle spindle, and myofibril. Fascia not only wraps around muscles and organs but also travels through them.

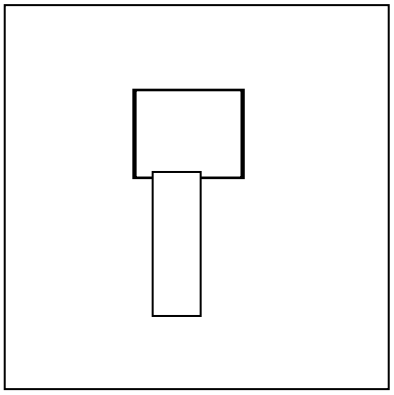


We are also supported, bound together, and held upright by the tensile strength of fascia. We would be just a puddle of liquid and a bag of bones lying on the floor if it weren't for fascia. Under our old model of thinking we were taught to believe that our skeleton is what holds us upright. Think of it like a column theory in engineering, the way most buildings are constructed. If we were built like a skyscraper, one column stacked on top of the other, then we would never be able to lift

our legs or bend our knees. The gravitational force would cause all of our joints to collapse onto each other because of the weight from above. Buildings built with the column method do not move very well!

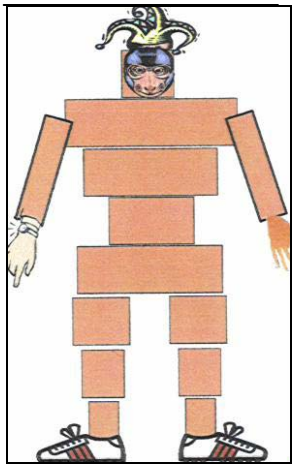
In fact, it is our fascia that holds us upright. Fascia functions like a guy wire, providing tensile strength in all directions. Wrapped around the muscles, it creates a system of cables and pulleys that provide lift and movement. Fascia works like the cables that hold up a suspension bridge: our bones act as the pillars (a place to which the muscles and fascia can connect), the muscles are like tiny motors that provide the movement, and the fascia creates the tension to hold us upright.

Tensile strength

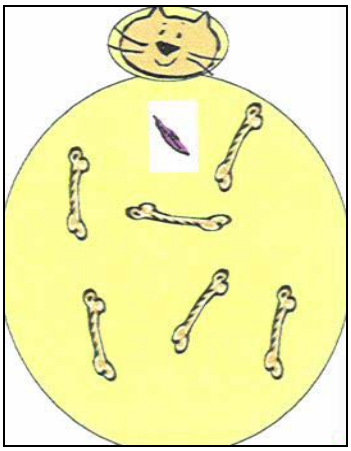


Column Theory

We can think of the body as being connected by a vast network of fascia. Tugging gently in the middle of the back one may be able to feel how the frontal sinus cavities are affected. A traumatic injury to the ankle may create tension around the ears. Fascia travels everywhere and is responsible for connecting all of the parts of our body.



The Body as a Column



The Body as a Bag of Water

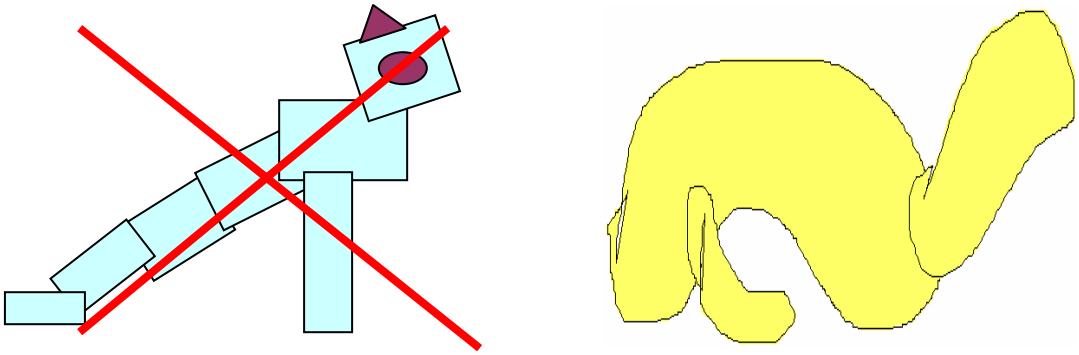
<u>The joys of yoga.</u>

Yoga has brought us many unique concepts and techniques to guide us through our world. One of these valuable gifts has been the development, over time, of the hatha yoga postures. These postures and specific movement and breath techniques can become vital in the maintenance of our health and wellness.

The gelatin matrix of our fascia can be changed by the application of heat and stretching. Heat applied through pressure, as in connective tissue bodywork, or in our own muscle activity, as in hatha yoga practice, will dissolve the hardness of our fascia. Then the fascia can be stretched, through bodywork or the muscles' own force of action, while practicing a yoga pose.

Using this approach, yoga postures become our tool to recreate our bodies each day as we warm up, stretch, and reshape our fascia, like carving a clay statuette. In yoga the focus is on lengthening and expanding the body, not only our muscles but also our entire network of fascia. Over time, with a continued practice, a person will actually grow taller and such ailments as scoliosis can be corrected. We do not have to end up shortened and compacted as we age. Not only is the skeletal muscular system affected but our internal organs as well. Yoga helps to open our organs by allowing the fascia around each organ to lengthen, creating more space for the organs to operate more efficiently. Organs, which are made of smooth muscle fibers, also contain this vast network of fascia. While practicing yoga poses not only are you stretching around an organ but you are also stretching through it.

Yoga is much more than a series of poses for exercise. It sends shock waves to the core of our being to energize and lengthen our fascia tissue. This liquid "goo" that permeates our body is being stretched and expanded. This bag of water that represents our liquid existence is being coaxed into changing shape.



During a yoga pose the body is more like a ball of liquid "goo" than a series of inter-connected blocks.

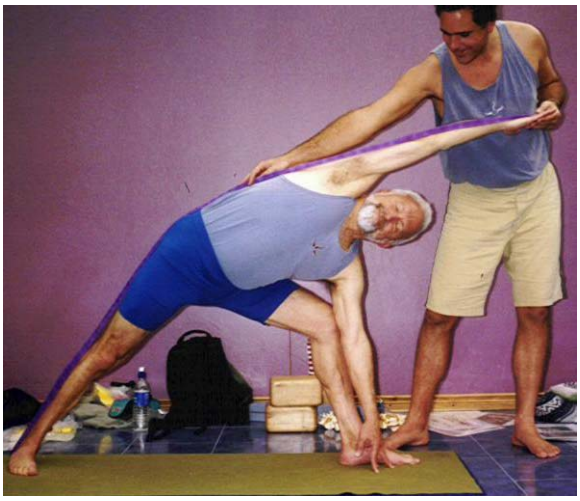
Fascia and energy

Another gift that the yoga world has given us has been our understanding of *Chi,* or vital energy. *Chi* is the electrical energy which travels to each and every cell in our body. Yoga has broadened our concept of lines of energy and meridians. We visualize our major energy centers in what have been called Chakras.

Unbeknownst to the yogis many years ago, our fascia system travels throughout our entire body as a conduit for energy. In fact, it may very well be our fascia that the yogis were trying to describe as the means by which energy flows through the body. Without the benefits of science they described this system the only way they knew how. Now, with the help of scientific methods, we can update our belief systems.

Fascia acts like a copper wire to transport *Chi* or life force energy through the body. The condition of the fascia will thus affect the flow of energy through our body. Unhealthy and hardened fascia does not transport energy very efficiently. This is like trying to send an electric

current through a rubber tire. It will not work very well. There is too much resistance for the electrons to flow.



Lines of Energy

Yoga also offers us the theory of "lines of energy." This concept teaches us to feel the direct pull through the body. When lined up correctly in a pose these lines of pull can be felt. This concept directly translates to the idea of fascia. There are specific fascia lines which act as stabilizers in the body and also as energy conduits. Yoga and science are both on the right track.

Fascia can also be responsible for the containment or the spread of disease. Fascia is the network in which energy travels. If disease is present in a specific area then healthy fascia will compartmentalize it and thus restrain it from spreading. Diseased fascia, however, will tend to spread infectious disease throughout the body because of its lack of containment properties and the fact that it travels to every cell in the body.

Fascia and aging

Throughout our lifetime most of us begin to stiffen and to shrink with age. This does not have to happen. It's not the accumulation of days that changes our bodies - it's *what we do* with those days.

The health of our fascia determines the state of our body as we age. Immobility is death for fascia. Lack of muscle movement and increased pressure will stiffen it; when this happens the

fascia tends to glue together through a process called *hydrogen bonding*. This process is further advanced by stress because stress tends to shorten muscles as part of our protection from fear. Back-and-forth movement that is repetitive and machine-like, and movement that is contractive and tends to tighten the body, also affect the body adversely and will lead to the demise of the fascia in the long term.

When our fascia becomes glued together in the hydrogen bonding process other complications may result. For example, consider the neck region and its many compartments and layers: large blood vessels leading up to the head, such as the carotid artery; the esophagus and trachea; glands like the thyroid gland. Within this very delicate area there are many muscles that criss-cross about. Each muscle and muscle layer, gland, blood vessel, and nerve is surrounded by fascia. As the fascia dries out and glues together all the tissues and organs within this region get pulled tighter. Difficulty in swallowing may result. Blood flow to the head may be reduced. The thyroid gland may be affected.

Fascia requires movement, warmth, and adequate hydration to remain healthy. Regular expansive movement like yoga, which is intended to warm the muscles, in turn heats the gelatin matrix in the surrounding fascia, and helps maintain the fluid-like nature of the fascia instead of turning it to rubber. When the fascia is more expansive and fluid greater energy or Chi flows through the body. Remaining vigilant to stay fully hydrated is also an important consideration for maintaining the health of your fascia.

Science and yoga are now meeting at the crossroads. They bring us different and unique perspectives on who we are. Separately they offer us understanding. Collectively they offer us a vision for a new future.

We do not have to shrink with age nor stiffen and become brittle. Our spine does not have to shrink and compress. Our fascia does not have to harden. We will all age. *How* we age becomes the critical question.

Examining our commitment each and every day will determine the nature of our fascia. To stop moving in an expansive fashion and remaining idle will only harden and shrink us. Doing nothing to reduce your stress levels will shorten your muscles and harden your fascia. The choice is yours. What is your commitment today?

Jon Burras is a certified yoga therapist and certified Bodymind therapist. He is also a champion for the rights of self-empowerment and believes in letting nature be the strongest guide.