

# YOGA FOR HEALTHY BONES

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Most of us get along in life without thinking much about our bones. We go through our daily routines and seldom give a second thought to the scores of bones that make up our skeleton. Unless something is broken or we are in pain we do not give our bones much attention.

The health of your bones comes from many sources. These sources may include your diet, exercise, hormone levels, and emotional wellbeing. While many factors play into your bones' health it is never too late to start thinking about how to improve the quality of your bones. We are often encouraged to spend time working on our waistline or our complexion. Why not begin to do something about maintaining healthy bones? One way to do that is through a dedicated yoga practice.

Yoga has been around for a few thousand years now. Yoga began in India and eventually migrated to the West in the last half century. While it may seem strange to the uninitiated yoga has some remarkable benefits to one's health. When it comes to your bones yoga is also a wonderful tool to help maintain bone health.

In the last two decades an alarming number of people, especially women, have been diagnosed with the bone disease called Osteoporosis. While there are many factors why this number has increased substantially, the fact remains that yoga has proven to be an effective and safe way to reduce the symptoms and to eventually heal from Osteoporosis. With a continued practice, yoga becomes a wonderful source of health and healing.

## **Anatomy of Bone**

Bones are living tissue. Bones are continually being broken down and rebuilt in our bodies. Consisting of 75% minerals, (like calcium and phosphorous), and 25 % a gelatin matrix of water and collagen, bones continue to be reshaped and renewed all the time. While bones appear solid they can be quite flexible and strong at the same time.

There is a delicate balancing act that goes on daily with minerals and our bones. A healthy body will reabsorb bone at the same rate as new bone growth occurs. Specialized cells called **osteoclasts** will remove bone while **osteoblasts** build bone. This cycle continues over and over. A healthy bone is one in which the building of new bone equals that of the bone being removed. Often, when calcium is not being absorbed and utilized effectively in other areas of the body, the calcium is leached from the bone to be used elsewhere.

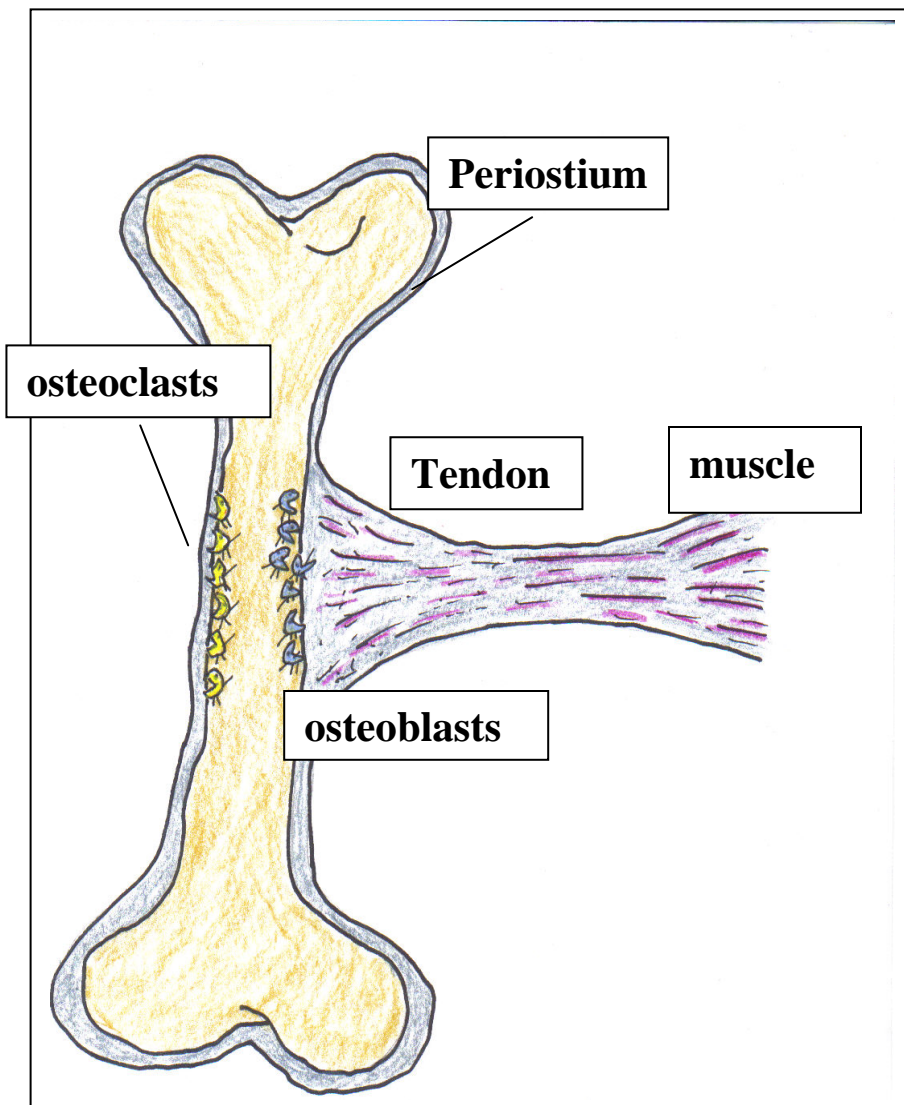
Deep within the center of each bone lays the Endostium. This layer of connective tissue lines the innermost center of the bone, where the bone marrow is created. This marrow is like a factory for new red and white blood cells. Bones do not just hold us upright. They are also important because they create red and white blood cells.

Surrounding the bone is a layer of connective tissue called the "**Periostium**". The Periostium is a vital component in the health of the bone. The Periostium is continuous with the connective tissue that travels through the bone as well as the tissue that connects

tendons and muscles to the bone. The Endostium inside the bone is connected to the outside by means of this connective tissue.

Bone is also a place for muscles and tendons to anchor onto. It is this anchoring of connective tissue called “fascia” that not only connects a tendon to the Periostium around the bone, but the same connective tissue passes through the tiny openings in the bone, all the way to the inside.

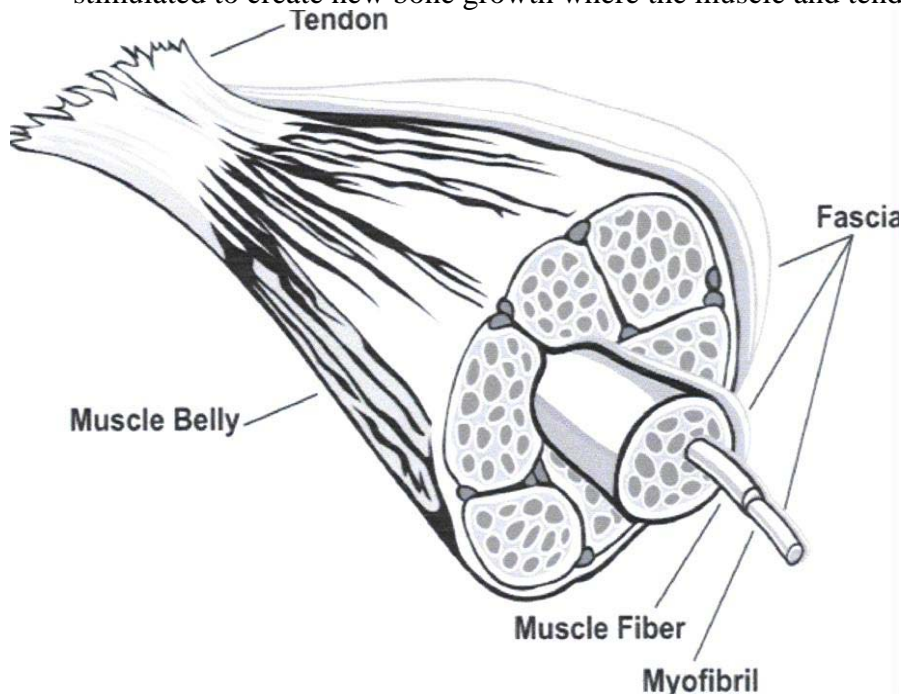
Without the Periostium the bone cannot survive. The Periostium is the means by which the bone receives many of its nutrients. Calcium and bone building osteoblast cells are transported to the bone through the Periostium. **The environment around each bone helps to determine the health of the bone itself.** The health of the bone is dependent on what is happening on the outside of the bone. If you were to magically remove a bone but kept the Periostium intact a new bone would grow in its place. But if you removed the Periostium the bone would die. This is the equivalent of stopping the watering of your garden. Without nutrients, the plants die. Without the Periostium, the bone dies.



### **Muscles Pulling on Bones**

Muscles, by way of nerve impulses, will contract and pull on a tendon that is attached to a bone. This occurs by way of an attached web of connective tissue surrounding and encapsulating every muscle fiber. Each muscle fiber is like string cheese. They are all wrapped in connective tissue, which continues on to become a tendon. The tendon, while not able to provide contraction itself, is pulled along by the muscle's action. A tendon is a denser version of the muscle, providing added strength.

This continuous web of connective tissue then becomes the Periosteum and ultimately travels through the bone to become the inside of the bone. Osteoblasts are stimulated to create new bone growth where the muscle and tendon are pulling. This bone



growth is to ensure that it will be strong enough to support the muscle that is tugging on it.

An athletic tennis player will have added bone growth in his racket hand, as compared to the non-dominant hand. Excessive use of one arm will create this imbalance. A tight muscle and tendon pulling on a bone can also create a bone spur. This occurs because the bone believes that

it needs to strengthen the area. Excess bone is built here to create an anchoring for the tight muscle pulling it.

### Exercise and Bones

Much has been written about the impact of exercise on bone growth. The standard treatment for low bone density is to prescribe high impact aerobics and strength training. While this may seem like a good beginning, ultimately it will create more damage in the long run.

A sedentary life is not beneficial to bone health. Insufficient stimulation of muscles pulling on bones causes the bones to weaken. More bone mass is removed than created as the bones are not stimulated to grow.

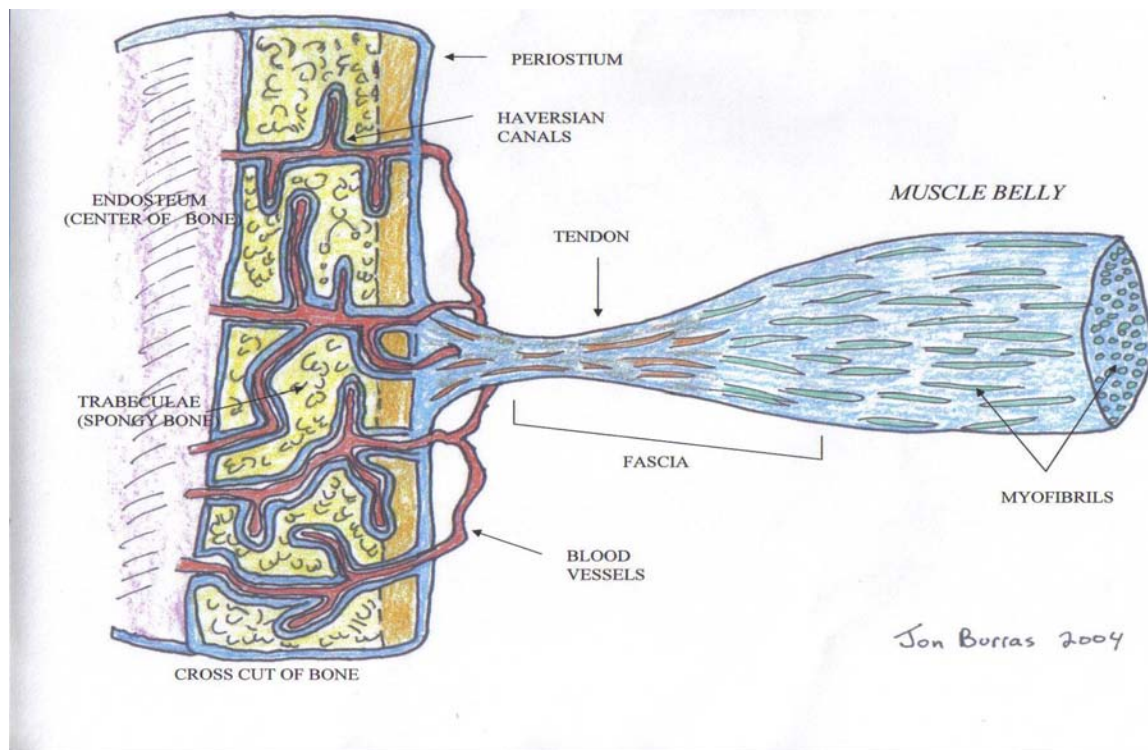
Just as well, a tight and hard body is not necessarily the picture of ideal health either. Tight muscles create a bunching up of myofibrils and a shortening of the muscle and fascia system. As the myofibrils become compacted they lose their ability to respond to relaxation and begin to dry out. As a consequence, the surrounding fascia will bond together like glue and take on a beef jerky like quality. This process is called

### Hydrogen Bonding.

This action is like dehydrating a grape into a raisin. When the fascia becomes dry and brittle it will lose its ability to transport nutrients to the bone. No matter how much calcium and other minerals you might take if they cannot be transported to the bone they are essentially worthless. "Weight bearing" exercise may provide the contraction on the bone necessary to stimulate growth. However, tight and hard muscles will dry out the surrounding fascia that feeds the bone its nutrients.

Excessive weight training and aerobics not only lead to stiff joints but they also cause the connective tissue that surrounds the bones to degenerate. Hardness and tightness is not necessarily health. When one continually hardens his body he is cutting

off the supply of nutrients to the bone. While creating stimulation for the bone is important, the right kind of stimulation is even more important.



**A web of Connective Tissue called Fascia**

## Yoga and Bones

There are many aspects of yoga. One of those aspects is the physical postures, also called “asanas”. It is through the yoga asanas that bone is able to be renewed and repaired as nature intended.

Most Western exercise is contractive in nature. This means that it is designed to tighten, shorten, and harden the body. A muscle that is only taught how to contract will ultimately lead to short and contracted muscles. As the muscles continue to contract the surrounding fascia will shorten, harden, and dry out as well. As we have seen, this means death to the bones.

Yoga is different. Yoga is a system that is designed to be expansive in nature. The body is taught how to lengthen and expand with each and every practice. Muscles will lengthen through the joints and the surrounding fascia will also take on a longer shape. With yoga the body is transformed into a longer and more spacious creation, rather than a stiff and hard body, as exemplified by most Western exercise.

There is also another important benefit of the yoga practice. As muscles warm and lengthen they create an affect called **Thixotropy**. This phenomenon occurs when a solid is turned to a liquid by the mechanical action around it. Thixotropy is often seen in earthquakes, where sandy soil will liquefy and homes will be swallowed up. As the ground shakes the mechanical action causes the sandy soil to change from a solid to a liquid.

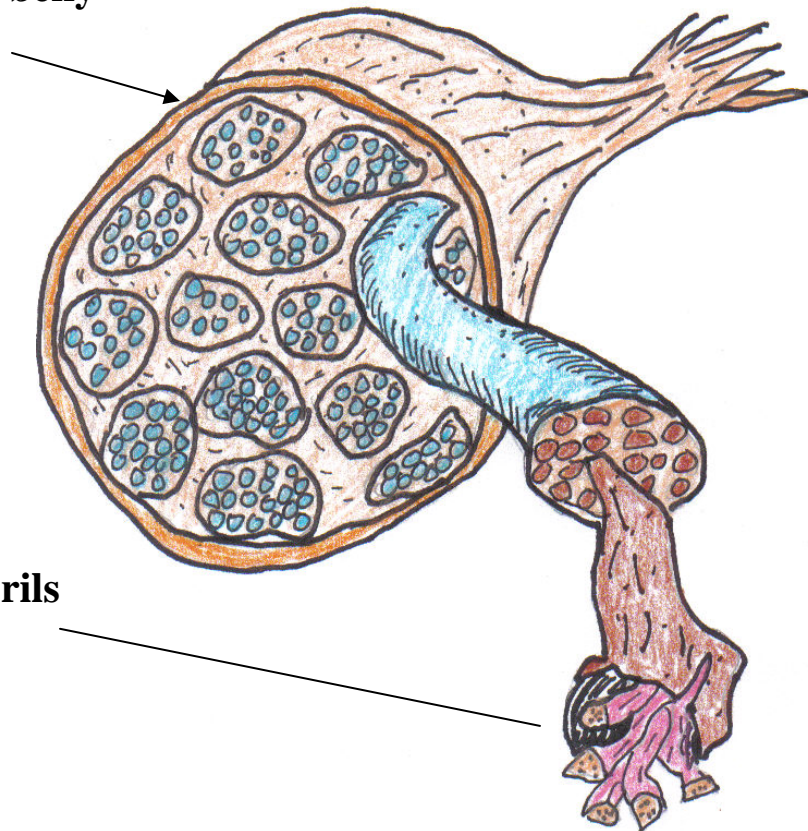
The same thing happens to the fascia when practicing yoga. The fascia is converted from a solid form to a liquid state. This helps keep the fascia loose, flexible,

and hydrated. Because of this nutrients are able to be transported through the fascia to the bone. Western exercise does not necessarily create this same affect of improving the quality of the fascia tissue. It only leads one to harden and stiffen. Western exercise focuses primarily on the strength of the muscles. **While muscle tone is important for healthy bones a tight and strong muscle does not necessarily mean a healthy muscle.** The connective tissue that surrounds the bones and muscles will be compromised as well.

Another important aspect of yoga is the ability for chi, or “life force energy”, to be transported through the fascia. “Chi” is like an electrical energy that travels through liquid tissue in the body but is blocked when encountering dried out tissue. As yoga lengthens and liquefies the fascia the chi energy is better able to be transported to the organs and bones. Chi is just as important as any physical nutrient the bones may require.

As we have previously seen, the bones are surrounded by fascia tissue. The health of the bones is determined by the health of the surrounding fascia. Yoga helps to optimize the health of the fascia.

## Muscle belly



## Myofibrils

When connective tissue squeezes together for long durations, usually precipitated by a tight and hard body, the myofibrils will dry out and lose their elasticity.



## **Bones Floating in Fascia**

Yoga is also important as a way to improve balance. Most people who break bones do so because their balance is impaired. They might slip and fall, breaking a wrist or a hip. Yoga helps to improve balance so the chances of falling are minimized. Most people never practice balancing in their lives. Yoga begins to change that.

Yoga has many other positive health benefits. Balance to the organs and glands is often seen with a dedicated yoga practice. Many people who fall and break bones do so because they are heavily medicated by drugs to treat symptoms of other diseases. These drugs often create a “foggy” or unfocused state in people. Yoga often begins to allow people to remove themselves from these mind-altering drugs, not only allowing them to become balanced and focused, but beginning to help heal these other disorders.

### **Conclusion**

In order to understand how yoga helps to create healthy bones it is important to imagine the relationship that bones have with the rest of the body. Bones are not isolated and do not stand alone. Bones are ever-changing and renewing structures that are **floating within a sea of fascia tissue**. The health of bones is determined by the health of the muscular system as well as the surrounding fascia. It does not matter how many calcium supplements you might take. Calcium that cannot reach the bones because of hardened fascia is worthless. It does not matter how many “reps” you perform on a weight machine. If you end up gluing and dehydrating the fascia you may end up worse off.

When we address the body we are really addressing relationships within the body. No single system works alone. Bones are dependent on the surrounding connective tissue for their health. Yoga is a profound system of energetic and physical forces that combine to nurture the bones. Without the connective tissue the bones could not survive.

Yoga, more than any other type of health program, can help in the renewal and maintenance of bones. No matter what the diagnosis or how depleted your bones may be, a committed yoga practice will begin to change all of that. No matter what age or gender you might be, it is never too late to begin a yoga practice. When it comes to your bones, yoga is the key to health and longevity.