

Yoga for Arthritis

excerpted from the book *Yoga for Arthritis* by Loren Fishman, MD, and Ellen Saltonstall

Three common reflexes are used in most of the hundreds of widely practiced yoga poses. The first two reflexes, a system of checks and balances, are almost always a part of yoga.

Every muscle in the body has a pair of reflexes that govern its activity. Whenever a muscle is stretched, one reflex—the stretch or myotatic reflex—stimulates the muscle to contract; the other—the Golgi tendon reflex—inhibits muscular contraction in response to stretch. Both reflexes start from tiny sense organs within each muscle and tendon that relay information back to the spinal cord.

When the reflexes that promote or facilitate muscle contraction get triggered, the muscles pull back. They are the ones that respond when the doctor strikes the tendon just below your kneecap. That quick little stretch of the quadriceps muscle results in a tightening of the muscle, contracting it and raising your lower leg. These reflexes are initiated by sense organs, the intrafusal fibers, but these organs also have tiny muscles within them! This allows them to adjust how strongly they stimulate the contraction of the large skeletal muscles.

Another set of sense organs in each muscle's tendon—the Golgi tendon organs—inhibit muscle contraction. When there is a tug on a muscle, be it by the hand of a good friend, the swing of a tennis racket, gravity, or yoga, these sense organs contract the spinal and pontine motor centers in the brain to modulate down the tone and actual contraction of every one of the body's muscles.

One basic mechanism in many yoga postures—entering them slowly and



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holding them—utilizes the fact that the intrafusal (stimulating) fibers are dynamic. Their response is adjustable and proportional to the speed of the stretch. Since they adjust internally to tension, they generally respond less to slow movements and have their greatest influence early in the process of muscle stretching. Their influence fades fast, though, especially if the muscle just stays at its new length. The inhibitory Golgi tendon organs damp down muscle contraction with a force that is weaker than the positive contraction-producing stimulus of the intrafusal fibers. But they continue to exert the same amount of inhibitory influence, at their original strength, over long periods of time. After a while, their constant input outstrips the diminishing influence of the intrafusal fibers. This naturally tends to reduce

a muscle's contractile force as a yoga pose is held.

After a short time—less than two minutes—the muscle will become quiet and stretch more easily and less painfully. Any sustained muscle stretch will eventually bring about a relaxation response in any muscle. Naturally, any pain stimuli that appear during that same time period will have a contrary, unsettling, and excitatory effect. The yoga poses that have lasted over the centuries succeed in accomplishing sustained stretch and relaxation without undue antagonistic, painful, or arousing stimuli.

Speaking of antagonistic, a third reflex is also, albeit very generally, at work during yoga postures. Every skeletal muscle has an antagonistic or direct counterpart: one set of muscles clasps the hand, another opens it. In order for one group of muscles to create a bend at the elbow, the muscles that straighten it must relax. This phenomenon, the agonist-antagonist reflex, is coordinated in the central nervous system. If you care to stretch the hamstring muscles, proceed by tightening the quadriceps, and the hamstrings will miraculously relax.

Tightening the quadriceps to straighten the leg at the knee will stretch the hamstring muscles and their Golgi tendon organs too, and soon the hamstrings will relax and stretch more and more easily.

There are several advantages to relaxed and extended muscles in a comfortable and calm individual. In people with arthritis of any type, and really in anyone threatened with decreased range of motion, reducing resistance to motion is an obvious (and painless) means to



Yoga Research Society
341 Fitzwater Street
Philadelphia, PA 19147

phone: 215-592-9642
email: YRS@YogaResearchSociety.com
website: www.YogaResearchSociety.com

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increase that range. But when arthritis grossly reshapes, distorts, or tightens joints—when just stretching muscles will not do the trick—yoga will render the process of increasing mobility more pleasant and calming, and therefore easier to endure.

However, in the vast majority of joints with restricted motion, where a leathery resistance is felt at the endpoints of movement, the cause is not a deformed joint but constricted joint capsules, tightened ligaments, or muscle shortening. Yoga is the perfect “minimal medicine” in such situations.

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The inevitable pounding, flexing, and grinding the human body experiences during life have pressured it to evolve many anatomical cushions, but alas, they too inevitably suffer from life’s buffeting. The incessant minor traumas add up, damaging the cushioning apparatus and eventually the structures they protect, increasing pain and instability, and reducing flexibility at the only places we can bend: the joints.

Yoga has been shown to improve the microenvironment of the cartilage and elastic parts of the joint and add no trauma. And for thousands of years it has been shown to increase flexibility.

*Dr. Loren Fishman will present
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at the 40th Annual
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