

What is Flexibility?

By Fredrick Hahn

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Sometimes a good stretch can feel exceedingly pleasurable. After a good night's sleep or after sitting in a chair for hours on end, a good, long stretch can be as rewarding as that first sip of morning coffee.

What is it about a morning stretch that feels so pleasurable? Why, on the other hand, is it so uncomfortable and sometimes downright painful when we stretch for fitness reasons? What is the physiological difference between that satisfying feeling of stretching after hours of idleness, and the searing pain of stretching designed to increase our flexibility? Could this pain be a warning? Might stretching for fitness reasons be a mistake? Is it possible that attempting to increase our flexibility by performing certain stretching procedures is inadvertently creating laxity in certain structures that are better off remaining taught? If so, how can we be certain when we stretch that we are not addressing these structures and possibly hurting ourselves? What is it that is making us so "tight" in the first place? Clearly muscular "flexibility" (or more specifically, the ability of the muscles to fully contract and lengthen so that the joints can flex and extend throughout a normal range of motion) is an important aspect of physical fitness. It is one of the six requirements of functional ability (the others being muscular strength, cardiovascular efficiency, neurological efficiency, bodily proportions and skill proficiency). However maybe stretching is not, after all, the safest or even an appropriate way to achieve it.

Try this quick experiment. Stand up and place your arms directly at your sides with your palms facing forward. Slowly extend your arms backward behind your buttocks. Congratulations! Your biceps muscles are now in a fully lengthened or stretched position. Did it hurt to do this? Unless you have some form of arthritis, this experiment should be completely painless. It may even have felt good. But if stretching procedures are designed to increase flexibility, how did you manage to accomplish the experiment without ever having stretched a day in your life? And even if you do stretch, how much more lengthened or flexible do you expect your biceps to get?

There are certain forms of stretching procedures that are sometimes necessary to perform. But these procedures are usually administered by physicians or physical therapists to bring back normal range of motion to a joint or muscular structure that has been injured. However, for the typical person, forcing joints to move into positions that are only required by practitioners of karate, ballet, gymnastics, etc., is unfounded for health reasons. It can permanently increase the length of the ligaments (ligaments are the anchors of your joints) causing joint instability and increasing the risk of physical injury.

The mobility of any joint is determined by several factors. But flexibility is primarily determined by muscular strength. For example, an elder man finds it difficult to reach his arm up to a shelf in his kitchen to get a can of soup. Upon cursory inspection we might easily deem this man's shoulder and arm muscles as being tight or "inflexible" and in need of stretching. But in fact, there is nothing at all wrong with his flexibility per se. The man's shoulder muscles are merely weak. The weight of his own arm represents too heavy a mass to easily reach up and grasp the can of soup. Without performing any typical stretching procedures, if we were to simply increase the strength of his shoulder and arm muscles, he would be able to effortlessly reach up and take the can of soup from off the shelf.

Can we say, from such a simple example as this, that muscular strengthening will enhance joint flexibility without the use of conventional stretching techniques?

Obviously, our ability to voluntarily move our joints is entirely dependent upon muscular strength. (Without muscles we couldn't move at all.) This being the case, what good does it do us to have marionette-like joints if this condition is nothing more than joint instability? People who you see at parties grasping their hands behind their back or putting their head between their knees or bending over backwards like a pretzel are demonstrating an unusual degree of joint laxity that is largely genetically inherited. (Harry Houdini, the great escape artist, is a perfect example of this.) Though we may clap and marvel at their carnival-like contortions, this kind of pliability is not to be envied. On the contrary, it is to be avoided. It is not, by any stretch of the imagination (pun intended), an indication of being flexible in a positive sense. It is a warning of gross and ultimately dangerous tendon and ligament laxity.

Today, we view the Jean Claude Van Damme's and Olga Korbet's of the world as fitness archetypes. As a result, extreme tendon and ligament laxity has become desirable. Consequently, flexibility has become dangerously misunderstood. Nowhere in the exercise physiology textbooks can be found a single chart or table that specifically designates the general and maximum range-of-motion capabilities of each of the joints of the body. None of the exercise instructor certification agencies directly address this issue in their study materials or exams. All that is said about flexibility is that it is an aspect of physical fitness and that stretching must be done to maintain or increase it.

Furthermore, stretching can easily cause injury. Only recently has the American College of Sports Medicine and the American Council on Exercise realized the potential dangers, and have abandoned all recommendations of ballistic forms of stretching (yet they continue to condone aerobics and plyometrics – ballistic forms of physical activity). Although this is a step in the right direction, it is still insufficient for purposes of safety. I often cringe in horror at watching a typical trainer lay across the back of a client (however gently) trying to stretch them as if they were preparing them for the movie *The Return of Bruce Lee*. Even the so-called "safe" methods of stretching, commonly used by physical therapists for rehabilitative purposes, are potentially dangerous and often cause the patient excruciating pain.

Proprioceptive-neuromuscular facilitation a.k.a. PNF stretching is a stretching technique touted by many trainers as the best and safest way to stretch. Indeed it does a very good job of increasing a given joints range-of-motion. However, if you observe someone performing PNF stretching techniques you will notice that PNF stretching is nothing more than manual resistive strength training! Manual resistive strength training is a fairly good way to strength train, but it is usually very impractical. It almost always requires another person, is difficult to learn, impossible to accurately record and is by no means the most effective strength training method available. If PNF is in fact the best and safest way to increase a person's flexibility it logically follows that the best form of strength training would also be the best way to increase flexibility – and it is.

Here is the bottom line on stretching: Stretching procedures performed for the purpose of increasing muscular flexibility are completely unnecessary for health and fitness purposes. Technically speaking, there is no such thing as "muscular flexibility." Joints flex, meaning, bend. Muscles contract, meaning, condense. (These are very important semantics to consider and understand.) When a given muscle fully contracts, its antagonist fully elongates or "uncontracts." (Example – when the biceps contract the triceps stretch.) When we stretch in the morning what we are really doing is contracting certain muscles very tightly, which causes a relaxation in the antagonists. That's what feels so good.

From his best-selling exercise book *The Nautilus Book*, exercise physiologist Ellington Darden, Ph.D., one of the most widely published and respected exercise physiologists in the field of fitness today, has this to say about flexibility:

"The supporting muscular strength about a joint is essential for its integrity. Stronger muscles possess better tonus and contribute greater stability at rest as well as during activity. And contrary to conventional belief, stronger muscles are generally more flexible muscles. Flexibility is adverse when it becomes excessive with respect to the joints. Increased flexibility can cause injury!"

Also in his book, Dr. Darden quotes two physicians, Dr. Stanley Plagenhoef of the University of Massachusetts and Dr. Richard Dominguez, of Loyola University Medical Center. Both doctors investigated claims that flexibility programs lend protection to athletes. Both doctors found not a single study that concluded or even supported such a widespread belief. Both doctors agree that sports medicine professionals currently overrate the importance of flexibility. Dr. Plagenhoef also expressed two other conclusions:

"If the joints of an athlete, or anyone, are surrounded and supported by stronger muscles, then the chance of any trauma is reduced. If a joint in question becomes more flexible but without a corresponding increase in muscular strength, injury probability is increased."

This extremely important point "...corresponding increase in muscular strength..." continues to elude the entire mainstream fitness industry.



Stretching techniques like those seen in Yoga or Pilates classes typify Dr. Plagenhoef's warning. (Reason: Yoga and Pilates disciplines do not measurably increase muscular strength.) And though these methods are usually taught by experienced and caring professionals, there is no way that anyone can know exactly when the tendons and ligaments are being over-stretched. At best, it is anybody's good guess. Needless to say, guesswork is not a safe, reliable or scientific tool for any purpose, let alone judging the potential for physical injury. And using pain as an indicator is not always dependable. At the point of feeling pain the damage, however slight, may have already been done.

Moreover, and most importantly, stretching procedures used as a means of making muscles more malleable is entirely illogical. The act of stretching any object does not augment the malleability of the object. It only temporarily elongates the object stretched. The only way to make something more malleable, no matter what the object may be, is to increase its elastic properties. You will not make a rubber band more elastic by continuously stretching it to its limits. At best, you eventually cause it to become permanently over stretched. In order to enhance the elasticity of a rubber band, you must somehow change its molecular structure. The same goes for your muscles.

Thankfully this is achievable by engaging in an activity that, when performed properly, is far safer and far more productive than stretching. And that activity is strength training. Strength training will enhance the natural range of motion of every joint in the body that is addressed if the joints require it. The reason for this is simple. As muscles become stronger, they experience superior blood flow making them more pliable, more elastic – more conducive to allowing the joints to flex and extend throughout a normal range of motion. And, as stated before, stronger muscles stabilize joints that are plagued with problematic joint laxity as a result of over-stretched tendons and ligaments often caused by stretching procedures!

Contrary to the old wives tale (and in accordance with scores of medical and fitness professionals) strong muscles are not tight muscles. (If they were, do you think gymnasts would be able to do what they do?) The safest and most efficient way to obtain enhanced joint flexibility, without causing joint instability, is by engaging in muscular strengthening exercises that work each joint throughout a full, pain-free range of motion.

So, ssssttttrrrreeeeeetccchhhh in the morning if it feels good. But, if you value the integrity of your joints, keep stretching far out of reach of your fitness program.

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