

Stretching: When and How to Do it Right

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Motion is life. To train properly and reduce your risk for injury it requires a balance between joint motion, muscle strength and muscular flexibility. Stretching is essential for muscular flexibility and done correctly will reduce your risk for injury and keep you healthy as you age.

Muscles and tendons are elastic by design. They function like a rubber band by stretching and contracting. However, over time, they will tend to shorten and contract if left to the rigors of daily life and training. Consider an infant who can easily place their foot behind their head, effortlessly. Yet, it is the rare adult who can still perform that range of motion. This is simply a result of not stretching over our lives to maintain that degree of flexibility. While this may be an extreme example, it is an illustration of the impact stretching can have on our muscles and tendons over time.

Genetics are another variable in flexibility, too. Some runners are like Gumby: super flexible, while others are more like The Thing: a rock. Regardless, everyone can improve their flexibility with time and effort.

There are **four distinct types** of stretching that have different effects on our muscles and are used in different situations. These techniques are passive stretching, active isolated stretching, dynamic stretching and neuromuscular stretching. Remember that muscles and tendons like to stretch, however, **ligaments and cartilage are not elastic and do not like to be stretched. Only attempt to lengthen these structures under a doctor's supervision.**

Let's begin with the five rules for stretching:

1. Determine your target area (s)
2. Know the proper technique
3. Use the correct hold time
4. Breathe
5. Be comfortable

Passive stretching is the most common technique used which employs holding a stretch for 20-30 seconds without motion or assistance. Research has shown passive stretching to be effective at increasing muscular length and joint motion. Many times gentle "pulses" at the end of the stretch are used to reinforce the lengthening process. If you are under 65 years old, passive stretches are effective when held for 30 seconds, however, in the over 65 age group, holding passive stretches 30-60 seconds is better. Two to four repetitions is the norm.

Passive stretching is not beneficial as a warm-up for athletic activity. In fact, it is most effective when your muscles are already warm. Therefore, as a rule of thumb break a sweat first with a light jog, then do passive stretches. Even better is to passively stretch after your workouts when your muscles are already warm.

Dynamic stretching is better designed for preparing muscles for activity. Using the body's momentum and force production you take the joint through the full range of available motion. Leg swings, lunges, and squats are perfect dynamic stretches for runners. The concept is to move through a full range of motion to get the joint and muscles prepared for activity. Generally one set of 10 -15 repetitions works well.

Active isolated stretching is one step beyond dynamic stretching where the stretch is isolated to a single muscle as opposed to full range of motion of the body. Here, the desired joint and muscle are first isolated and then the opposing muscles are contracted to create the stretch. Let's apply this to your hamstrings. First, lie on your back and raise the leg you want to stretch 90 degrees at the hip and to 90 degrees at the knee to isolate the hamstring. Grasp the leg just below the knee and then actively contract the thigh (quadriceps) straightening the knee and creating a stretch on the hamstring. Hold for 1-2 seconds and repeat for 5-10 reps. This is perfect for prior to activity and can also be done with an assistive device such as a stretch out strap, towel or training partner.

Neuromuscular stretching is the best for lengthening muscles. This requires either another person or an assistive device such as a towel or stretch out strap. With neuromuscular stretching you are using a muscular reflex called the Law of Reciprocal Inhibition to lengthen tight muscles. Reciprocal inhibition is the relaxation of a muscle as its opposing muscle contracts, i.e., to bend your knee the hamstrings contract and the quadriceps relax through this neurologic reflex.

To illustrate neuromuscular stretching let's look at the hamstring again. Lie on our back, and keeping our leg straight, have your assistant raise it up as far as possible and hold it there. Next you isometrically contract the hamstring with a light resistance while your assistant keeps the leg still for 7-10 seconds. Immediately after you complete the contraction you raise the leg as best you can while your partner also passively stretches your hamstring farther holding the stretch for 20-30 seconds. Repeat the process from this new lengthened starting point with another light isometric contraction of the hamstrings followed by the quadriceps contraction and stretch. One set of three repetitions is sufficient for neuromuscular stretching.

While stretching may hurt, it should not be painful. Never stretch through pain or any burning sensation unless directed by your doctor. An acceptable amount of discomfort from stretching will only last for a few minutes after you are finished. If intense pain is present or if the pain lingers, back off and check with your doctor. A burning sensation also needs to be avoided as it may indicate nerves are being pulled. Nerves are not elastic and will violently reject stretching. They prefer to glide amongst your muscles.

Also, **remember to breathe.** It works the best to exhale as you move into the stretch. This will help to relax the muscles for more efficient use of your stretching time.

In summary:

- **Passive Stretches:** Best when the muscles are warm and post workout. Hold 20-30+ seconds, 2-4 reps.
- **Dynamic Stretches:** Best prior to activity. One set with controlled motion, 10-15 reps.
- **Active Isolated Stretches:** Best prior to activity. One set, 1-2 second hold, 5-10 reps.
- **Neuromuscular Stretches:** Best when the muscles are warm and post workout. Passive stretch, 7-10 second contraction, followed by stretch and holds 20 seconds. 1 set of 3 reps.

To maintain your mileage and an active life, keep your muscles healthy with targeted stretching along with self myofascial release to break up chronic muscle knots. Dr. DeFabio

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