



The American Orthopaedic
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SPORTS TIP

Flexibility and Stretching

EXPERT CONSULTANT: Stephen J. Nicholas, MD

Flexibility is recognized as an important component of physical fitness. Like other components of fitness, flexibility is more important for some sports than others. For example, long distance runners tend to be relatively inflexible because the activity of running does not require large deviations in motion. However, sprinters, and especially hurdlers, require excessive hip motion for sprinting and hurdle clearance. Not only are flexibility requirements sports-specific, but they can also be joint-specific. In general, athletes must have sufficient musculoskeletal flexibility to meet the demands of the sport, otherwise top performance will not be achieved and injury risk will increase.

How can flexibility be developed?

An individual's flexibility is a genetic attribute with potential for improvement with training and exercise. There are many approaches to stretching, but typically it involves some type of active and non-active (static) motion.

Static stretches are thought to be safer because they involve a slow passive stretch to the targeted muscle, such as a straight leg raise for the hamstrings. The muscle is held in a stretched position for 10 to 60 seconds and is repeated 2 to 6 times.

Active stretches are movements intended to be repeated and release the targeted muscle group without a hold period, such as standing with the knees straight, feet spread apart, and alternately touching the right foot with the left hand and the left foot with the right hand. Five to ten repetitions for up to 60 seconds are

typical. Injury risk may increase with active stretching if the movements are too fast. Active stretches are also an integral component of yoga. Many athletes may improve their flexibility by incorporating yoga movements into their training program.

Regardless of the type of stretch used to make improvements, it is essential that it sufficiently stresses the target muscle or joints. However, it is also important to avoid causing an injury by overstressing the target area. The general recommendation is to stretch to the point of mild discomfort, but not to the point of pain.

One of the first noticeable improvements to a flexibility program is an increased tolerance of a stretch, where the perceived discomfort decreases. Improving flexibility will allow for an increase in joint range of motion.

For long-term improvements in flexibility, stretching should be performed at least every other day, for a minimum of six weeks. If the stretching regime is not maintained, the gains in flexibility will soon start to reverse.

What is the injury risk to stretching?

The flexibility concerns of the athlete should be two-fold:

- Is there sufficient specific flexibility to adequately perform the activities required
- Is the overall flexibility sufficient so as not to place an increased risk for injury.

Too often, the emphasis is on overall flexibility rather than addressing the specific flexibility requirements of a given sport. The association between flexibility and injury risk is often overstated and interpreted simplistically. The inflexible or "tight" athlete may not be at an increased risk for injury. It is probably those athletes at either extreme of the flexibility realm that may increase their injury risk. The key is to determine the flexibility patterns typical for individuals in a given sport, and encourage the athletes with inadequate flexibility to work on specific stretching activities.

Warm-up and stretching prior to a sports activity can also help prevent injury. It is important to differentiate between warm-up and stretching prior to an activity from flexibility.

Flexibility is largely an inherent or intrinsic attribute while pre-activity warm-up and stretching are practices that an athlete chooses to perform.

Warm-up and stretching are as important to the flexible athlete as the inflexible athlete. Warming up by lightly exercising the major muscle groups for given activity has the same effect as stretching. Both activities decrease tension in the muscles and increase available joint motion.

How does aging affect flexibility?

Flexibility is known to decrease with age and the older athlete often complains of increased stiffness when performing habitual sporting activities. Loss of flexibility is common as one ages.



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The muscles simply get shorter throughout the aging process and subsequently lose their ability to operate effectively at the extremes of motion. Although flexibility exercises are useful in improving mobility, maintaining muscle strength by performing exercises such as the seated hip stretch is probably more important for the elderly.

Summary

Athletes must have sufficient flexibility to meet the demands of their sport, otherwise performance will be impaired and injury risks may increase. Flexibility patterns are specific to given sports and are typically quantified using non-active tests of maximum range of motion. Stretching techniques involving constant stretches or cyclic stretches are used to improve flexibility in the long-term and are also used as part of pre-activity warm-up.