



## FLEXIBILITY AND STRETCHING

**F**lexibility is an important component of physical fitness, and is considered a significant contributing factor for optimal athletic performance. While individual's flexibility is a genetic attribute, there is significant potential for improvement, and stretching is considered the primary way of increasing one's flexibility. However, a considerable controversy exists regarding whether or not improved flexibility actually improves athletic performance, and whether or not stretching prior to or after sports participation helps decrease the risk of injury.

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It is believed that, in general, athletes must have sufficient musculoskeletal flexibility to meet the demands of their sport; otherwise, top performance may not be achieved and injury risk may increase. However, one of the problems with evaluating the relationship between stretching/flexibility and athletic performance/injury is that, typically, "overall" flexibility of an athlete is considered. Instead, flexibility requirements should be considered in a sports-specific and joint-specific manner. Whereas some sports may require significant flexibility of a particular joint to reach optimal performance and avoid injury, others may actually require the opposite. For example, while the shoulder of a baseball pitcher typically exhibits tremendous range of motion, the same joint in a football lineman may actually benefit from increased stability, which may come at a price of decreased mobility. Similarly, long-distance runners may not need the same degree of flexibility in their hips and knees compared to sprinters, due to different types of lower extremity motion required in these sports.

In order to achieve optimal athletic performance, and help decrease the risk of injury, the athlete must strive for balanced flexibility, targeting specific muscles and joints required for their sport. Injuries and conditions that decrease flexibility and cause imbalance in joint mobility must be addressed promptly and adequately, prior to return to sports participation.



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### How can flexibility be developed?

Stretching is believed to be an important component of preparation for athletic participation, and should be incorporated into the training regimen of both the recreational and professional athletes.

It is important to remember that, in addition to stretching, strength training, conditioning, and warm-up have an important role in optimizing athletic performance, as well as in injury prevention. Therefore, stretching should be done after an appropriate warm-up period.

Stretching exercises are broadly divided into static and dynamic types. Static stretches typically involve slow passive stretch of the targeted muscle, such as a straight leg raise, maintained in one position, to stretch the hamstrings. The muscle is held in a stretched position for 10 to 60 seconds, and the movement is repeated 2 to 6 times. Static stretches are considered the safer of the two types.

Dynamic, or 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 or the amplitude is excessive.

Regardless of the type of stretch used, the goal is to sufficiently stress the targeted muscles and joints to improve flexibility, but without overstressing the area in a way that can cause injury. 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 regimen is not maintained, the gains in flexibility will soon start to reverse.

### Flexibility and Aging

Flexibility is known to decrease with age, as muscles tend to get shorter and lose some of their ability to elongate. The older athlete often complains of increased stiffness when performing habitual sporting activities, and may also be at an increased risk of injury. While loss of flexibility is common and expected as one ages, gentle stretching exercises may be beneficial in helping maintain joint mobility in the senior athlete. These athletes should also perform routine exercises for maintenance of core stability, strength, and balance, and should avoid taking their joints to extremes of motion, as injury may occur.

### Summary

Athletes must have sufficient and properly targeted flexibility to meet the demands of their sport, otherwise performance may be impaired and injury risks may increase. Flexibility should be assessed uniquely for specific sports and specific body parts. Techniques involving static or dynamic stretches can be used to improve flexibility in the long-term, and should be incorporated into the pre-activity warm-up, as well as combined with strength and conditioning programs for athletes of all ages and levels.

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