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INSIDE THIS ISSUE:

To Stretch or Not To Stretch

By Matt Brzycki, Assistant Director of Campus Recreation, Fitness, Princeton University

Flexibility can be defined as the range of motion (ROM) throughout which your joints can move. The best way for you to maintain – or improve – the ROM of your joints is to perform specific stretches to elongate the surrounding muscles.

Increasing flexibility serves at least two purposes. First, being more flexible enables you to exert your strength over a greater ROM. Second, improving your flexibility allows you to move your joints through a greater ROM which makes it easier for you to assume body positions that are otherwise difficult. This, of course, is an advantage in many sports and activities such as the martial arts.

Nonetheless, there are two misconceptions about pre-activity stretching. One long-time assumption is that pre-activity stretching reduces the risk of injury. This belief wasn't based on any research but it seemed reasonable to assume such. But as it turns out, there's scant research on the effects of pre-activity stretching on the risk of injury. And the relatively few studies that have been conducted on the topic show that pre-activity stretching doesn't reduce injuries.

In two studies of Australian Army recruits, 1,284 recruits who stretched prior to physical training had 181 injuries and 1,347 recruits who didn't stretch had 200 injuries. So, the incidence of injury was very similar regardless of whether or not stretching was done before an activity.

Another belief is that pre-activity stretching improves performance. Again, this notion has been based more on a "gut feeling" than on scientific research. Most studies have shown that stretching prior to an activity can actually hinder a muscle's ability to produce maximum force, at least temporarily. To date, in fact, *no study* has shown that pre-activity stretching improves performance. But there's a bit more to the story.

In one study, 13 subjects were exposed to three different conditions of passive stretching (for durations of two, four and eight minutes) and a control (non-stretching) condition. Passive stretching of the calves was performed on a dynamometer for 30 seconds then released for 20 seconds. This stretch-release sequence was repeated until the muscle was stretched for the assigned duration. For example, two minutes of stretching involved four 30-second stretches.

The researchers found that stretching decreased strength by as much as 6%. However, this wasn't significantly different than the control condition in which stretching wasn't done. The decreases were dose dependant in that as the length of the stretching protocol increased so did the reduction in strength.

This dose-response effect has been corroborated by a systematic review of more than 100 studies. According to the review, no detrimental effects on performance occur when stretches are held for up to 30 seconds. Decrements in performance are most likely to occur when stretches are held for more than 60 seconds.

Bottom line: Pre-activity stretching doesn't decrease injuries or help performance but doesn't increase injuries or hurt performance as long as the duration of the stretch isn't excessive.

Matt Brzycki is the Assistant Director of Campus Recreation, Fitness at Princeton University in Princeton, New Jersey. A former Marine Drill Instructor, he has authored, co-authored and edited 17 books including his latest, the fourth edition of A Practical Approach to Strength Training.