Dynamic Stretching vs. Static Stretching

by Taylor Tollison

As coaches and trainers we will perform anything from plyometrics to sprinting to reduce injury and increase performance. The real question is whether the type of stretching we chose to perform before activity will have an affect on the performance and injury levels of our athletes.

STATIC STRETCHING

Many coaches advocate the use of static stretching prior to exercise. Static stretching involves reaching forward to a point of tension and holding the stretch. Static stretching has been used through out the years for two main reasons: injury prevention and performance enhancement. (1) Does static stretching prior to activity achieve the goals of injury prevention and performance enhancement? Research has shown that static stretching can be detrimental to performance and doesn't necessarily lead to decreases in injury. Below are a few studies done on the topic of static stretching:

1. Rod Pope an army physiotherapist in Australia, recently carried out a wide study to assess the relationship between static stretching and injury prevention. Pope monitored over 1600 recruits over the course of a year in randomised controlled trials. He found no differences in the occurrence of injury between those recruits who statically stretched and those who did not. (1, 2)
2. "Gleim & McHugh (1997), would also challenge the premise that stretching, or indeed increased flexibility, reduces the risk of injury" (1,3)
3. New research has shown that static stretching decreases eccentric strength for up to an hour after the stretch. Static stretching has been shown to decrease muscle strength by up to 9% for 60 minutes following the stretch and decrease eccentric strength by 7% followed by a specific hamstring stretch. (4)
4. Rosenbaum and Hennig showed that static stretching reduced peak force by 5% and the rate of force production by 8%. This study was about Achilles tendon reflex activity. (5)
5. Gerard van der poel stated that static stretching caused a specific decrease in the specific coordination of explosive movements. (4)

6. Three 15-second stretches of the hamstrings, quadriceps, and calf muscles reduced the peak vertical velocity of a vertical jump in the majority of subjects (Knudson et al. 2000). (6,7)
7. Moscov (1993) found that there is no relationship between static flexibility and dynamic flexibility. This suggests that an increased static range of motion may not be translated into functional, sport-specific flexibility, which is largely dynamic in most sporting situations (1)
8. Static based stretching programs seem best suited following an activity. (8)

In soccer it is vitally important to have explosive muscles that allow a player to jump higher for the winning header or to explode past an opponent to get to the ball quicker. Almost every movement in soccer is preceded by an eccentric movement. For example, when you run you bend your legs first then explode forward. In jumping you must bend your legs first then jump. Finally, cutting in soccer requires a lot of eccentric power. Wouldn't it make sense to have optimal power, coordination and eccentric strength to succeed in soccer? If we shouldn't static stretch before a game or practice then how can we stretch to optimize performance on the field? The answer is dynamic stretching.

DYNAMIC STRETCHING

Many of the best strength coaches support the use of dynamic stretching. Dynamic stretching consists of functional based exercises which use sport specific movements to prepare the body for movement. (8) "*Dynamic stretching*, according to *Kurz*, "involves moving parts of your body and gradually increasing reach, speed of movement, or both." Do not confuse dynamic stretching with ballistic stretching! Dynamic stretching consists of controlled leg and arm swings that take you (gently!) to the limits of your range of motion. Ballistic stretches involve trying to force a part of the body *beyond* its range of motion. In dynamic stretches, there are no bounces or "jerky" movements. (9) Several professional coaches, authors and studies have supported or shown the effectiveness of dynamic stretching. Below are a few examples of support for dynamic stretching:

1. Mike Boyle uses a dynamic warm-up with his athletes. He goes through about 26000 workouts over the course of a summer. In 2002 he did not have one major muscle pull that required medical attention. (10)

2. Flexibility is speed specific. There are two kinds of stretch receptors, one measures magnitude and speed and the other measures magnitude only. Static flexibility improves static flexibility and dynamic flexibility improves dynamic flexibility which is why it doesn't make sense to static stretch prior to dynamic activity. There is considerable but not complete transfer of static stretching to dynamic stretching(11)
3. One author compared a team that dynamically stretched to a team that static stretched. The team that dynamically stretched had fewer injuries. (8)
4. There are few sports where achieving static flexibility is advantageous to success in the sport. Therefore according to the principle of specificity it would seem to be more advantageous to perform a dynamic warm-up which more resembles the activity of the sport.(12)
5. Dynamic Flexibility increases core temperature, muscle temperature, elongates the muscles, stimulates the nervous system, and helps decrease the chance of injury. (13)
6. Another author showed that dynamic stretching does increase flexibility. (11)

As coaches, trainers and parents we all want our athletes to lower their incidence of injury and increase performance. Dynamic flexibility has been used successfully by trainers and coaches to increase flexibility and possibly lower the incidence of injury. It is the job of the coach or trainer to pick the method they feel is best suited for the sport and athletes. The above evidence suggests the possibility that static stretching prior to activity is not the best solution. Static stretching doesn't necessarily lead to a decrease in injury and but may actually decrease performance. If one purpose of the warm-up is to warm-up the body, wouldn't static stretching actually cool the body down? If static stretching is not the solution to a pre-game warm-up what is? Dynamic stretching.

A sports performance program could look like this:

Beginning- Dynamic warm up
Middle- Actual workout
End- Cool down/static stretching

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