

THE THEORY AND PRACTICE OF FLEXIBILITY AND STRETCHING

Stretching has long been considered a necessary part of any training or game program. It has been ingrained into pre-game and pre-practice routines. Recent studies have shown, however, that stretching can actually hurt rather than help when it comes to sports.

Characteristics of Muscle

1. Contractility
2. Excitability
3. Extendability
4. Elasticity
5. Irritability

Muscle Anatomy:

The Actin/Myosin cross bridge design acts similar to a crew team rowing. The globular proteins at the end of the Myosin heads catch the Actin walls and pull the Actin proteins together. As the surrounding myofilaments (muscle cells) do the same, the muscle contracts and a weight is lifted.

Muscle Spindles and Golgi Tendon Organs are important pieces when touching on stretching and muscle fibers. Muscle Spindles are coiled nerve receptors that measure and report to the brain on length and tension of muscle. Golgi Tendon Organs (GTO) are found in the tendons and report to the brain on tension of tendons. Both provide defense mechanisms in terms of overload in an explosive manner and a slow loading manner.

It is important to know about these two receptors because stretching needs to be done to overcome these two receptors to avoid the stretch reflex that occurs when they are acted upon. The duration of the stretches needs to be long enough to counteract the receptors reading.

Conversely, stretching inhibits the Muscle Spindles and Golgi Tendon Organs. This is important because if you are to do any explosive exercise, the protective mechanism can be inhibited which may result in damage and injury.

Types of Stretching:

Static (Hold/Stretch)

Benefit/Harm:

>Good short term, does not address problem long term.
>Bad before activity
>Must wait after activity for max benefits.

PNF (Stretch/Push)

>Increases Range of Motion
>Good, but not great warmup
>Affects GTO, Muscle Spindles

Dynamic Warm Up

>Works movements, not muscles
>Warms up entire body

Yoga

>Works movements
>Slow, more relaxing

Pilates

>Works movements
>More of a workout than stretch

Conclusion:

Though stretching is a valid form of exercise, the current theory is that stretching is most of the time done improperly or at the wrong time. In order to achieve the maximum benefits of stretching, the following guidelines should be followed:

1. A dynamic warm up is favorable to a static stretching program. This is due to the stretch reflex and the inhibition of the contractile mechanism.
2. Static stretching should be done at least 3-4 hours after a workout. This allows the nervous system to relax and the stretch will be more effective.
3. All static stretching should be held for at least 1 minute. Repeating this will allow greater stretch. This procedure will allow maximum stretch by inhibiting the Muscle Spindles
4. A warm up that favors movements over individual muscles will increase body temperature faster and will provide a more appropriate preparation for exercise.

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