

## Stretching for Injury Prevention & Exercise Performance – a review of current research

Athletes use various types of stretching to increase muscle flexibility, reduce the risk of injury and improve performance. However there is little evidence to support the relationship between pre-exercise static stretching and a reduction in injury. Pre-exercise static stretching has been found to decrease muscle strength, power output and balance for up to 15minutes after being stretched. In addition post exercise stretching is not encouraged because stretching fatigued muscles tends to facilitate muscle spindle and inhibit GTO firing which does not allow for the muscle to relax and effectively elongate.

So what are the most effective forms of stretching and when should you use them?

### When & How to Stretch

The research indicates that there are seven muscle groups that tend to shorten during the course of swim season for many swimmers. In an effort to maintain normal range of motion, offset the development of a muscle imbalance, and prevent dysfunctional movements, it is recommended to stretch the following muscles:

1. Upper Trapezius
2. Levator Scapulae
3. Pectoris Major and Minor
4. Latissimus Dorsi
5. Rotator Cuff - Internal Rotators
6. Hamstrings
7. Hip Flexors

### **Improving Flexibility – Static Stretching (1-3 x 15-30sec holds)**

Regular static stretching (three to five days a week) will improve exercise performance, decrease injury and increase range of motion. Static or foam roll stretching is more beneficial as a separate activity, ideally as close to bedtime as possible. This is because your body does most of its tissue healing at night, and if you lengthen tight muscles before bed, they will heal in a lengthened state, progressively balancing your body.

### **Pre-Exercise Stretching – Dynamic Warm-up (1-3 x 8-10 repetitions)**

The purpose of a pre workout warm-up is to offset muscle imbalances and activate the neuro-muscular system in preparation for activity.

### **Post Exercise Recovery**

Although post exercise is not the ideal time to stretch due to the reasons outlined below, practically it makes sense to stretch when the muscles are warm and the team is together. Following a cool down (swim down) muscles should be relaxed enough and can be stretched following the guidelines of Static Stretching.

### **References:**

1. Active Shoulder Warm-Up for the Competitive Swimmer (George T. Edelman, April 2009)
  2. Intelligent Stretching (Paul Chek, April 2005, [www.ptonthenet.com](http://www.ptonthenet.com))
- Prevention is Better Than Cure (Diane Elliot, Swimming Magazine, May 2010)

## Static Stretching Routine 2010 (1-2 x 30sec hold)

### Hip Flexor



### Standing Hamstring



### Standing Quadricep



### Adductors



### Calf



### Glutes



### Lower Back



### Triceps



### Spinal Twist



### Internal Rotators



### Chest



### Neck



### Upper Back



