



SPORTS TRAINING TIPS: SWIMMING

U W H E A L T H S P O R T S M E D I C I N E

SWIMMING INJURIES

Competitive swimming is both a popular and demanding sport. Year-round competitive swimmers average 6,000–10,000 yards/meters per day, using freestyle as their primary training stroke. At an average of 8–10 arm cycles per 25 yards, a swimmer completes over 30,000 shoulder rotations each week, placing tremendous stress on the shoulder joint (Heinlein et al, Sports Health, 2010). Although the shoulder is the most frequently injured body part in swimmers, back and knee injuries are also common. It is reported that approximately half of competitive swimmers will develop shoulder pain severe enough to cause them to alter their training schedule at some point during their swimming career (Stocker et al, Clin J Sports Med, 1995). Faulty stroke mechanics, training errors, overuse (repetitive micro-injuries) and muscular imbalances are several of the factors that contribute to shoulder pain in swimmers.

How can swimming injuries be prevented?

Swimmers, coaches and medical professionals continually seek to optimize performance and reduce the risk of injury in training and competition. The following are recommendations aimed at preventing swimming related injuries:

- **Core stabilization exercises**

One of the most important keys to preventing shoulder injuries is developing and maintaining your core strength. The majority of the force produced in swimming is done with the trunk and shoulder, however, most swimmers rely too much on their shoulders. Developing a strong core will reduce the stress on your upper limbs to move you through the water and reduce the occurrence of shoulder injuries.

- **Postural training/strengthening**

Head and shoulder postural alignment is thought to influence muscular balance around the shoulder. Poor shoulder blade stability (postural strength) is correlated with shoulder impingement and pain. The shoulder blade can be viewed as the link in the kinetic chain from the legs and trunk to the shoulders.

- **Avoid over-stretching the shoulder**

The majority of swimmers have ample if not excessive shoulder mobility. Stretches that focus on stretching the front of the shoulder are not necessarily helpful and may contribute to shoulder looseness (hypermobility). Shoulder hypermobility along with muscle imbalance and fatigue can lead to shoulder pain.

- **Gradual increase in yardage**

Swimmers making a transition to a new level of swimming (age group, high school, college) and potentially longer distance demands in practice have an increased risk for injury. Special attention should be paid to any swimmers making such a transition, and distance increases should be gradual and monitored closely.

- **Communication among the swimmer, parents, coaches and medical professionals is critical to both injury prevention and successful recovery.**



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Good Freestyle Technique

Good freestyle technique is critical in the prevention of shoulder injuries as freestyle is the most common training stroke. Good freestyle technique include the following characteristics:

Body rotation. The body should rotate about an axis defined by a line from the top of your head through your neck, back, and legs. During body rotation, or roll, the shoulders, torso and hips should all turn together as one. Adequate body rotation is essential to decrease shoulder stress by transferring the power from the core to the propulsive arm in the water. Body rotation also allows for a more efficient stroke and decreased distance per stroke.

Bilateral (both sides) breathing. Developing a good, even body rotation through the development of an efficient bilateral breathing pattern is key to reducing shoulder injuries.

Hand entry. Avoid entering with thumb first as this puts the shoulder into excessive internal rotation, which contributes to shoulder impingement and pain.

Avoid hand crossing midline at entry into the water.

Crossing midline forces the shoulder into an impingement position which may contribute to shoulder pain.

High elbow (bent elbow) catch and pull through technique.

Swimmers should grab or catch the water with a bent elbow in order to utilize the larger, more powerful chest and back muscles, rather than rely solely upon the shoulder muscles.

How are swimming injuries treated?

The treatment needed will vary from injury to injury and swimmer to swimmer. At the UW Health Sports Medicine Center we take a comprehensive approach to treatment. This involves starting with an evaluation by a sports medicine physician or sports rehabilitation specialist (physical therapist or athletic trainer) and x-rays or MRIs if needed. Following this evaluation, most swimmers will undergo specialized rehabilitation that may include strengthening/postural exercises, flexibility exercises, manual therapy treatments, and swim drills to correct stroke flaws. Video analysis—over water and under water video—of stroke biomechanics may also be used to identify stroke faults that may be causing pain.

Injury treatment plans may involve icing, relative rest with non-aggravating strokes, kicking drills and modification in training both in and out of the pool. At times, it may be appropriate to rest from swimming until symptoms improve. However, most swimmers are able to continue to participate with reduced distance or by only performing kicking activities.

References

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- Stocker D, Pink M, Jobe, F. Comparison of Shoulder Injury in Collegiate and Master's Level Swimmers. *Clin J Sports Med.* 1995 Jan; 5(1): 4–8.
- Bak K. The Practical Management of Swimmer's Painful Shoulder: Etiology, Diagnosis, and Treatment. *Clin J Sport Med.* 2010 Sept; 20(5):386–390.

For more information about sports rehabilitation services, please visit uwhealth.org/sportsrehab or call (608) 263-4765.