BACK IN THE GAME
VOLUME 8 SPRING • 2008
Rehabilitation information for those who enjoy the sporting life

Delayed-Onset Muscle Soreness

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Have you ever awoke the morning after a strength training session and dreaded setting foot on the floor for fear of the pain that awaits you? Even simple tasks such as sitting up in bed, brushing your teeth, or just walking downstairs seem to be daunting because you're sore all over. What you are experiencing is known as delayed-onset muscle soreness (DOMS).

DOMS can result from things such as unusually strenuous physical activity, or exercising after long periods of inactivity and sedentary lifestyle. Symptoms of DOMS include body aches, fatigue, soreness and pain. Symptoms can begin hours after a training session, and can last for a few days. DOMS can also compromise proper recovery and decrease an athlete's desire to continue with exercise and training.

Although the exact cause of DOMS is unknown, some theories suggest that the muscle-lengthening phase of exercises such as running downhill (quadriceps), and the down-phase of a bench press (pectorals) cause micro-tears in muscle.

Other theories suggest that pain is not due to exercise, but rather from the healing process that muscle goes through in order to increase fiber size. The healing process causes cells to swell and put pressure on nerves and arteries, causing soreness.

Whatever the cause may be, DOMS can be dangerous for athletes, as it can decrease optimal performance and place them at risk for injury.

Can DOMS be prevented? A recent study put two groups of athletes through a resistance training program combined with aerobic exercise and a cool down that consisted mostly of stretching. Both groups performed the same amount and type of exercise, but at different times.

The first group performed a 5-minute aerobic warm-up consisting of treadmill running, followed by the resistance training regimen for 60 minutes. During resistance training subjects rested between sets, allowing their heart rate to be decreased. Afterward, they ran for 30 minutes, followed by a 15-minute cool-down.

The second group performed a 20-minute aerobic warm-up consisting of treadmill running, followed by 75 minutes of resistance training program where heart rate was accelerated between sets. This was done by performing a short session of vigorous aerobic exercise (usually treadmill running) between each set of resistance training.

After careful analysis, the study concluded that DOMS caused by traditional resistance training can

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Sports Medicine
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Frozen Shoulder

By: Jennifer Lewis, Student Physical Therapist

Frozen shoulder, also known as adhesive capsulitis is a condition that affects the shoulder joint and its respective joint capsule. It is commonly associated with stiffness and pain resulting in a decreased ability to move the shoulder in all directions.

The shoulder joint is composed of a shallow cup and a ball joint covered by a capsule. A cartilage ring provides increased depth and increased surface area to the shallow cup. Muscles and ligaments contribute support to the shoulder joint, while the ligaments make up the joint capsule. A frozen shoulder occurs when the joint capsule becomes inflamed resulting in a very restrictive and immobile shoulder.

Frozen shoulder typically develops slowly, and in three stages. Each of these stages can last a number of months.

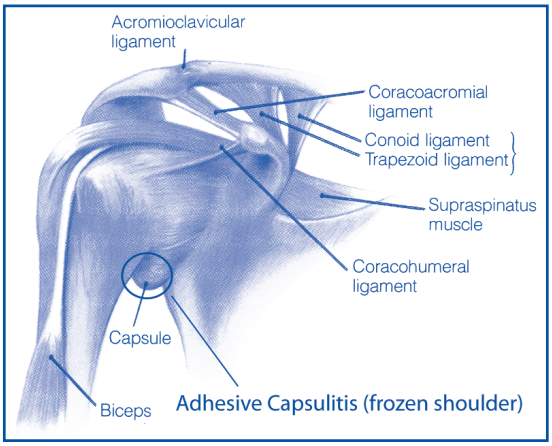
(1) Painful stage (freezing stage) is associated with a decrease in the ability to move the shoulder and lasts approximately 6 weeks to 9 months.

(2) Adhesive stage (freezing stage) is the point at which the capsule becomes shortened and very restrictive resulting in minimal shoulder movement. This stage can last between 4 to 9 months.

(3) Recovery stage (thawing stage) lasts about 5 to 26 months. Full range-of-motion and functional mobility of the shoulder is projected to be achieved by the end of the recovery phase.

For some people, the pain worsens at night, sometimes disrupting normal sleep patterns.

The true underlying reason for the development of a frozen shoulder is unknown. It can be the result of an injury or problem at the shoulder such as, fracture, surgery, bursitis, rotator cuff tear, or an impingement. Another speculated cause is an autoimmune reaction, where the body's immune system attacks the body's defense system as opposed to attacking any foreign particles posing any threat to inflammation or infection.



Adhesive Capsulitis (frozen shoulder)

Treatment for adhesive capsulitis is dependent on the stage and the severity of the condition. The condition has the potential of resolving on its own over the course of 1-2 years. The least aggressive approaches include physical therapy, cortisone injections into the joint, and antiinflammatory medications.

Physical therapy will focus on stretching, strengthening, and specific mobilizing techniques combined with different types of modalities (ice, heat, ultrasound, and electrical stimulation) to facilitate a quicker change. In addition, exercises can be performed at home to further enhance the effects of physical therapy.

If it is determined that these approaches are unsuccessful, the condition may then require a more aggressive approach involving manipulation of the shoulder joint while under anesthesia or surgery to release any scar tissue. Your physician will help to determine the best choice of treatment.

For more information on adhesive capsulitis (frozen shoulder), contact a physical therapist at the Marquette General Rehabilitation Center at 906-225-3186.

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be reduced or eliminated within a couple of weeks by aerobically elevating heart rate before each set (like the second group in the study).

Conventional methods for weight training may not be the best thing for our athletes. Most often when lifting weights, athletes rest between sets.

However, in order to achieve maximum results, it may be in our best interest to have athletes perform some jumping jacks or a sprint around the gym between their sets. The benefits go beyond preventing DOMS, including time and energy efficiency, as well as enhancing cardiovascular endurance.

If your athletes are consistently complaining of soreness from their resistance training programs, try changing your approach. For more information on DOMS, call the Marquette General Rehabilitation Center at 906-225-3186.