

Newsletter

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THE DAY AFTER

WHAT CAUSES THOSE ACHES AND PAINS

Adapted from an article by John Spiker, P.T., A.T.C. originally appearing in Sport Care and Fitness, May/June 1989.

During the season, many athletes often complain about post-game soreness. Determining whether this soreness is from typical muscle aches and pains or from an acute injury is important, but often difficult. With a working knowledge of exercise physiology and a game plan for treatment and prevention of injuries, coaches in conjunction with health care professionals can help keep players on the field and off the sidelines.

CAUSES OF MUSCLE SORENESS

Causes of post-game soreness vary from contusions to minor strains to overuse. The soreness often comes from soft tissue injuries, which are common in collision sports. Research provides several theories as to why delayed onset muscle soreness occurs; however, most pertain to non-contact activities, such as running.

LACTIC ACID INNOCENT

Lactic acid build-up often has been blamed for muscle fatigue and discomfort. However, this concept is not as widely accepted today. Lactic acid is produced during intense levels of exercise when the oxygen demands of the tissues increase beyond what the blood is capable of delivering. To obtain more energy, the body begins another process, which works in the absence of oxygen. Lactic acid, a by-product of this process, then diffuses out of the muscle and into the blood to be reabsorbed. Lactic acid accumulation is high during track events and other brief, high intensity activities. Lactic acid build-up probably does not alter the performance of athletes involved in team sports. Most lactic acid is removed from the tissues within 1 to 3 hours of activity; therefore it does not explain next day soreness.

TISSUE MICROTRAUMA AND ECCENTRIC CONTRACTIONS

Other theories focus on either tissue microtrauma or eccentric contractions (development of tension in a muscle biopsy samples taken from marathon runners, Hagerman and colleagues concluded that muscle degeneration begins with physical trauma to the muscle, probably caused by the mechanical wear and tear of repeated exercise at relatively high intensity. Eccentric contractions-such as those occurring in plyometrics (repetitive exercises consisting of an eccentric contraction followed by a rapid concentric contraction) downhill running and weight lifting-often cause post-exercise soreness. Several theories center on the concept that the maximal overload of the muscle during eccentric contraction causes the soreness. Literature states that eccentric muscle contractions present a greater degree of muscle soreness than do concentric contractions (the contraction of a muscle as it shortens).

MYOSITIS OSSIFICANS AND TENDINITIS

If an athlete has a consistent or unusual discomfort, the athletic trainer must evaluate the injury. If not treated or treated improperly, what is perceived as a bruise or "Charley Horse" may turn into myositis ossificans (calcium deposit in a muscle, following a blunt injury, which can lead to muscle fibre tears and

bleeding). Athletes in contact sports often experience this in the anterior thigh and lateral aspect of the upper arm. Chronic cases of tendonitis (inflammation of a tendon) also can develop if the proper steps are not taken to reduce inflammation and maintain normal joint range of motion. Therefore, these types of injuries must receive qualified medical attention and rehabilitation.

TREATMENT

Initial first-aid treatment should focus on the use of cold and limited use of the muscle through gentle pain free stretching. Cryotherapy (ice massage, cold whirlpool, ice bags etc) can help alleviate soreness, decrease swelling and reduce muscle spasms during the first 48-72 hours. Warm whirlpools and gentle massage also can promote blood flow, disperse any debris which has accumulated in the muscle tissues and relieve swelling. This treatment is effective as long as no acute injury is present.

ACTIVITY versus REST

The athlete's continued activity, not complete rest, is important in reducing muscle soreness. It has been theorized that pain from muscle soreness may cause an involuntary muscle spasm. Thus, gradual static stretching to relieve the involuntary spasm and subsequent muscle soreness has been advocated. Gentle stretching, jogging, swimming or brisk walking all help reduce help reduce muscle spasms and remove the waste products of strenuous exercise. This is why cooling down following a practice or game is important. The day following a game should include flexibility and a light work-out consisting of running or swimming and should conclude with further flexibility exercises.

ANTI-INFLAMMATORY DRUGS

Aspirin or other anti-inflammatory medications should not be used to help relieve soreness. If micro trauma or acute injury is present, aspirin will increase blood flow and swelling to the area. These medications also will inhibit the release of prostaglandins, hormones which may be important in muscle repair. This can delay healing. All anti-inflammatory medications should be used under the direction of a physician.

ANALGESICS

Analgesic balms and ointments, which are sources of superficial warmth that increase local circulation, do not penetrate the skin deeply enough to provide a true physiological response. Any lotion gently applied to the sore area will provide similar results because of the therapeutic massage. Caution must be taken with a suspected soft tissue injury/contusion because the friction from massage can increase bleeding and irritation.

PREVENTION

Injury prevention is the key to a successful athletic program. Athletes must be required to wear all the appropriate equipment during practice and games. Each athlete must be responsible for adhering to the sports specific requirements. An adequate warm-up before and cool-down after each practice or game will help minimize post-exercise soreness. Stretching and light activity will help increase each athlete's flexibility and increase the distance over which force may be applied. This will help reduce the chance of injury. A 20-minute cool-down that includes flexibility and easy jogging can help reduce muscle spasm and promote circulation. An athlete who displays poor playing technique is prone to injury. Therefore, sport-specific activities should be included in the prevention program.

By listening carefully to each athlete, sports aiders can uncover any significant soft-tissue injuries or possible chronic conditions and make the necessary referrals to the appropriate health care professionals. Through consistent conditioning and flexibility programs throughout the season, a coach can help keep the athletes in playing condition and off the sidelines.