

## Delayed Onset Muscle Soreness

You just got back from the gym and you feel great! During today's workout you were able to push yourself a little harder than normal and you are feeling totally pumped, looking forward to that next training session. Later that night your muscles feel fatigued and tired and you know you are going to get a good night sleep. When you wake, you feel as though you have magically aged twenty years and your muscles and body ache like rigor mortise is setting in. Joints and muscles are stiff and the last thing you want to do is return back to the gym for more, so you take it easy. The next day, you wake up in worst shape than the day before and simple tasks such as walking up stairs, brushing your hair, or getting up from your seat seem like parts of a triathlon event. What's going on with your body? You felt great leaving the gym after your workout, did you catch some disease in the locker room that is eating away at your body, or even worse, are little men sneaking into your room at night and beating you with a baseball bat? Before you start to panic, relax, more than likely you are suffering the effects of delayed onset muscle soreness (DOMS).

Delayed onset muscle soreness is appropriately named because it is usually 24-48 hours after a strenuous athletic event when peak muscle soreness sets in. The theory behind this phenomenon is that immediately after the event or workout, the body has a high amount of endorphins circulating in the bloodstream that are produced during exercise. These endorphins are the body's natural painkillers and inhibit the transmission of pain impulses while providing an overall feeling of euphoria. This explains why immediately after exercise you usually feel fantastic. However, once these endorphins wear off, you begin to feel the effects of the stress and strain a hard workout puts on your muscles and joints.

The major contributors to muscle pain and soreness are either microtears in the muscle fibers or a build-up of lactic acid. Microtears occur when you load the muscle past its anatomical limit and the fibers of the muscle actually incur some degree of tissue damage. This tearing is most common when performing eccentric contractions of muscle or negative training. Studies have shown that during the negative portion of muscle action, or when the muscle is being forced to lengthen against a resistance, there is a greater proportion of tearing that occurs at the actin and myosin crossbridges. This microtrauma can cause local inflammatory responses, which, in turn, stimulate pain receptors in the muscle. Lactic acid build up occurs primarily during anaerobic exercises such as weight training. Lactic acid is a normal by-product of muscle metabolism that is formed as the body converts glycogen (muscle fuel) to ATP (energy). It is usually cleared through the muscle via metabolic processes and circulation, but while present, can stimulate pain receptors causing muscles to ache. Both of these pain-producing mechanisms are normal responses that, in time, will lessen as the body heals the tissue damage and breaks down the abundance of acid formation.

Various techniques can be used to speed up the recovery process and get you back in action as soon as possible. In the instance of microtears of muscle fibers, you need to make sure your body is supplied with the necessary building blocks to rebuild and repair the damaged tissue. Since the body uses protein as the major builder of new tissue, it is essential that you supplement your diet with adequate amounts of protein and amino acids. Without enough protein in your diet, your body will have a much harder time repairing itself and muscle growth will be next to impossible. The best protein sources are vegetable based such as soy. Contrary to many beliefs, vegetables, especially the bean family, are an excellent source of usable protein. Other protein sources include nuts, seeds, fish, poultry, egg whites, and lean meats. Red meats, cheeses and milk proteins are not ideal protein sources since they are very hard to digest and are linked to a variety of diseases from allergies to heart disease to cancer.

Increasing local circulation is another method of getting rid of muscle soreness. With increased blood flow to sore muscles, the body can supply all the nutrients needed for repair. This will speed up healing time in the case of tissue damage as well as help wash away the build up of lactic acid. Excellent passive techniques for increasing circulation include massage and hot/cold or contrast therapy. Massage is best performed by a licensed massage therapist and has been proven to reduce the effects of delayed onset muscle soreness. Contrast therapy is done by first using cold packs on the affected region for approx. 20-min. and then switching to hot packs for 20 min. and back to cold packs for the same time frame. This causes a flushing effect in the muscle tissue and helps clear away the lactic acid buildup. Active techniques such as aerobic exercise can also work wonders on muscle soreness. Not only will this increase circulation throughout the whole body, it will also increase tissue oxygenation, which is important considering lactic acid is dissipated in the presence of oxygen.

Nutritional Supplementation is another valuable tool in the reduction of post exercise soreness. If local inflammation is at the root of the soreness there are effective natural anti-inflammatory supplements that

you should try before reaching for the Tylenol and ibuprofen. Specifically boswellia, ginger, turmeric and curcumin have been proven to exhibit anti-inflammatory properties without the undesirable side effects of NSAID's and ibuprofen. Essential fatty acids including Omega-3 and Omega-6 have also been proven to reduce inflammation in the body and decrease pain receptor stimulation. Calcium and magnesium supplementation, as well as chondroprotective agents like glucosamine sulfate could be taken to assist in the muscle and connective tissue repair process. Dimethylglycine or DMG, used before and during workouts, increases tissue oxygenation and inhibits the buildup of lactic acid. Antioxidants, especially vitamin C, should also be part of your post exercise nutritional regimen to fight the damaging affects of free radicals that are produced during strenuous exercise.

Topical creams and rubs can also provide temporary relief of post exercise muscle soreness. Dimethylsulfoxide (DMSO), a byproduct of wood processing, is a liquid that can be applied topically to relieve pain, reduce swelling, and promote the healing of damaged tissue. Sports rubs such as Flex-all, Ben Gay, Tiger Balm, and Mineral Ice can all supply temporary relief by providing an analgesic effect and increasing local circulation.

Pain and muscle soreness is part of the picture when trying to improve your physique or performance through vigorous exercise. Delayed onset muscle soreness should begin around 24 hours after the event and last no longer than 72 hours. If you feel that the pain is not going away or that excessive swelling or skin discoloration develops, you might have injured yourself more than you think and professional help in the form of a Chiropractor, Physical Therapist or Medical Doctor is advised. If you are not seriously injured and are just suffering from delayed onset muscle soreness any and all of the above mentioned techniques can be used to hasten your recovery and get you back in action.

Dr. Bernie Sengstock is a licensed Chiropractor working towards his Diplomate in Chiropractic Rehabilitation. His practice combines Chiropractic technique with Clinical Nutrition, Massage Therapy, Physical Therapy & Rehabilitation. The practice is based at Spinecare/American Comprehensive P.C., a multidisciplinary health care facility in East Islip, NY. Dr. Sengstock is available for speaking engagements on a variety of health care topics. For information, consultation or appointments please call (516) 277-0060.

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