

## ***Dr. Gabe Mirkin's Fitness and Health E-Zine***

# **Cramps Probably Caused by Muscle Damage**

March 16, 2008

Even though muscle cramps are extremely common in competitive athletes, we really do not know what causes them. Nobody has shown consistent benefit from any of the most common treatments: multivitamin pills; mineral pills with calcium, zinc, magnesium, salt and/or potassium; massage or chiropractic manipulation; drinking large amounts of water; dietary manipulations; or bio-mechanical stretching and strengthening.

Known medical causes of muscle cramps are extremely rare in athletes. These include narrowed blood vessels, usually from atherosclerosis; compression of nerves, low thyroid function, or side effects of medications such as diuretics. Some cramps are caused by low mineral or fluid levels (*The Japanese Journal of Clinical Pathology*, November 2007). However, for the vast majority of people who suffer exercise-associated muscle cramps, blood levels of sodium, potassium, calcium and magnesium are normal. Research in athletes after they ran in 52-mile races showed that the runners who suffered cramps had the same level of dehydration and blood mineral levels as those who did not get muscle cramps. Cramping during exercise usually occurs in healthy people without any underlying disease or known cause.

I think that the most common cause of exercise-associated cramps is damage to the muscle itself. Before you get a cramp, you will probably feel that muscle pulling and tightening. If you slow down, the pulling lessens, but if you continue to push the pace, the muscle goes into a sustained cramp and you have to stop exercising to work the cramp out. Further evidence that muscle damage is the cause of the cramp is that the muscle often hurts for hours or days afterwards.

You may be able to prevent cramps by exercising more frequently but less intensely and for shorter periods of time, but most serious exercisers do not want to do this. There is some evidence that taking sugared drinks and foods during prolonged exercise helps maintain endurance and muscle integrity which helps prevent cramps. So take a source of sugar every 30 minutes or so during a vigorous workout, and back off if you feel a group of muscles pulling and tightening during exercise. Most exercisers just accept that occasional cramps will occur and cause no long-term harm.

## **Night-Time Leg Cramps**

**Report #6752**

Have you been awakened in the middle of the night by a sudden painful cramp in your leg? So have lots of other people.

Cramping during sleep is usually due to an exaggeration of a normal muscle reflex. When you turn during sleep, you contract your calf muscles and stretch their tendons. This stimulates nerve stretch receptors in the tendon and sends a message back to the spinal cord, telling the calf muscles to contract. Sometimes, the muscles remain contracted and hurt. Painful muscle cramps at night can also be caused by nerve damage such as that caused by pinching a nerve, muscle damage, a partially-obstructed flow of blood to the legs, or abnormal mineral or hormone levels, so if you have this problem, check with your doctor. If you do not have a serious cause, you can often prevent night cramps by exhausting the stretch reflex before you go to bed by stretching your calf muscles with wall pushups, and applying a heating pad for 10 minutes before you go to sleep.

The only drug that has been shown to be effective in treating night-time leg cramps is quinine, but the Food and Drug Administration stopped over-the-counter marketing of this remedy because of concerns about irregular heart beats and other side effects. Doctors may still prescribe quinine pills for relief of leg cramps, but they can cause birth defects and miscarriages, so they should never be taken by a pregnant woman. Quinine can also cause ringing in the ears, headache, nausea, disturbed vision, chest pain, asthma and other problems

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# **Muscle Cramps in Endurance Events**

April 9, 2006

If you've ever developed severe muscle cramps during long-term exercise, the odds are that you never found out why it happened. Doctors in South Africa studied triathletes and found that most of the time, the muscles cramps were not caused by dehydration, thyroid disease, blocked blood flow, nerve damage, or mineral abnormalities of calcium, sodium, magnesium or potassium (*Medicine & Science in Sports & Exercise*, July 2005).

The athletes with cramps had normal electrolytes and did not lose more fluid during exercise than those who did not suffer cramps. The researchers showed that the most likely cause is muscle fatigue or tearing of the muscle itself. Electromyograph (EMG) studies at one to five minutes showed markedly elevated electrical activity of the nerves controlling the cramped muscles. Therefore muscle cramps during long distance athletic events appeared to be caused by exercise-induced damage to the muscles themselves. If this is true, muscle cramps during endurance events can be prevented by slowing down when you feel excessive soreness in one muscle group or straining in a muscle. Of course, competitive athletes will not do this, and they pay for it with muscle cramps.