

Muscle Cramps: Causes and Cures

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During a hard practice, game or match, an athlete might experience muscle tightness and cramping. If severe enough, a muscle cramp can finish you from competition. What causes the cramps? Is there a cure?

What Causes Muscle Cramps?

Fluid and Sodium Factor

Although there are many causes of muscle cramps, large losses of sodium and fluid can be key factors that predispose athletes to run-of-the-mill muscle cramps. Sodium is an important mineral in initiating signals from nerves and actions that lead to movement in the muscles, so a deficit of this element and fluid may make muscles "irritable." Under such conditions, a slight stress, such as a subsequent movement may cause the muscle to contract and twitch uncontrollably.

Cramping Case Study

A case study* lends support to the theory. An elite tennis player was found to lose more sodium in his sweat during several hours of play than he consumed throughout the entire day. During intense play that resulted in sweat loss of up to 3 quarts an hour, the player knotted up with the cramps. Following physiological testing, it was recommended that the player add salt to his diet and drink sports drinks (Gatorade). This addition of sodium reduced subsequent cramping episodes. Whenever the player felt cramps coming on in a game, he drank a sports drink containing sodium chloride. The cramps ceased.

After checking with a physician to rule out serious causes (see: "Other Potential Causes"), an athlete who experiences muscle cramps after a workout might want to add sodium to meals. Given the popularity of low sodium diets, a sodium deficit is not out of the question when an athlete is sweating at high rates, particularly in the hot months of the year. Salty snacks or an extra tap of the salt shaker will help replenish the mineral. Consuming sports drinks that contain an adequate amount of sodium is also a subtle way to replace sodium.

Gatorade contains 110 mg of sodium per eight ounces, the same amount of sodium in a glass of milk or slice of bread. This is an amount which helps replace lost sodium yet still meets FDA standards for being a low-sodium food.

Minding Your Minerals

For many years, players have attributed cramping to the depletion of potassium or other minerals like calcium and magnesium from the body. However, research indicates that these minerals are less likely to cause cramping.

The amounts of potassium, calcium and magnesium in sweat are low compared to those of sodium and chloride. In addition, potassium, magnesium and calcium are easily replaced by the diet, so a deficit of any of these is rare.

Other Potential Causes

Diabetes, neurologic disorders or vascular problems could be a factor in cramping episodes. Also, anecdotal reports indicate that the use of certain dietary supplements such as creatine might increase the risk of muscle cramps. If cramps suddenly occur without a prior history, consult a physician to rule out more serious causes.

Players have attributed cramping to the depletion of potassium or other minerals such as calcium or magnesium. The current medical thinking doesn't support this. Muscles tend to hoard potassium, calcium, and magnesium such that they are lost at minor levels in sweat, compared to sodium and chloride losses. The diet usually supplies adequate amounts to prevent deficits that would contribute to cramping episodes. But further research may tell us otherwise.

Preventing Cramps

Stave off cramps before they start by recommending athletes to follow these simple guidelines:

1. Drink plenty of fluids to stay hydrated during exercise;
2. Replenish sodium levels *during* times of heavy exercise and profuse sweating with a sports drink like Gatorade;
3. Ensure adequate nutritional recovery (particularly for salt) and rest for muscles after hard training.

Quick Fixes for Cramps

When cramps strike during a workout or competition, take immediate action with the following:

1. Stretch. Because cramps are often related to a change in weight bearing, stretching and non weight-bearing exercises are effective treatments.
2. Massage the area. Rubbing the cramped muscle may help alleviate pain as well as help stimulate blood flow and fluid movement into the area.
3. Stimulate recovery. Rest and adequate rehydration with fluids containing electrolytes, particularly sodium, will quickly bring improvement.

* Bergeron, M. Heat Cramps During Tennis: A Case Report. *International Journal of Sport Nutrition* 6:62-68, 1996.