



## Muscle Cramps — More than Just Dehydration

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Muscle cramps are a debilitating and painful experience that occurs during or shortly after exercise. In the past, muscle cramps were thought to have been caused by dehydration and electrolyte loss, commonly seen in high intensity workouts and game competition. Athletes who developed cramps were treated with massage, as well as rehydration using water and/or fluids containing electrolytes. Medical professionals taking care of athletes commonly recommended significant hydration in the days leading up to a game in the hopes of preventing muscle cramps.

While this belief that muscle cramps are caused by dehydration has been pervasive among athletes, trainers, etc. recent evidence has shown that simple hydration cannot prevent, or for that matter cure athletic cramps.(1-4) Braulick et al measured muscle cramp threshold frequency in athletes both when they were well hydrated and when they were dehydrated with accompanying electrolyte loss.(1) The goal was to determine if athletes were more susceptible to cramps when they became dehydrated/lost electrolytes. The authors did not see a significant difference in how likely the athletes were to develop a cramp between the hydrated and dehydrated/electrolyte depleted states, indicating dehydration may not be the root cause of the muscle cramps. A separate theory, know as the neuromuscular theory, has emerged in recent years and involves a combination of factors including fatigue, inadequate conditioning, muscle damage and others as the cause of muscle cramps. These elements combine to keep muscles in an excited state with nothing to stop them and then they begin to involuntarily contract, spasm, and/or cause muscle cramps. A recent literature review found an increasing number of studies and higher level evidence to support the neuromuscular theory over the dehydration theory.(2) With this in mind, treatment and prevention strategies may need to focus on decreasing muscle excitability.

Fatigue, muscle damage, dehydration, etc. all play a role in the development of muscle cramps. Preventive programs focused primarily on stretching, as well as on proper hydration, muscle health, and adequate conditioning are crucial for athletes to decrease the risk of muscle cramps. Proper hydration is still important, but adequate conditioning and other measures are also necessary to prevent exercise associated muscle cramps.

### References

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