

AthletiHINTS



AthletiCare

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Creatine Supplementation

Introduction

The latest athletic performance-enhancing aid seems to be creatine. While creatine is easily bought over the counter, there is some question as to efficacy and any potential harmful effects it may have.

As experts await the results of long-term studies, there is no general agreement on the use of creatine.

What exactly is creatine?

Creatine is an amino acid stored in muscle as phosphocreatine. During intense exercise, phosphocreatine breaks down into creatine and phosphate, releasing energy that regenerates adenosine 5'-triphosphate (ATP), which in turn fuels muscle contractions.

The normal daily requirement of creatine is about 2 g for a 70 kg (150 lb) person — about half comes from animal protein and the other half is synthesized by the body. Several studies have indicated that short-term creatine supplementation increases phosphocreatine stores in muscles by 10 percent to 40 percent. These gains in muscle mass are thought to occur from fluid retention and/or stimulation of protein synthesis.

Creatine supplementation may allow athletes to maintain greater training volumes, which may promote muscle hypertrophy. However, the mechanism of this is not fully understood.

Creatine is commonly available in powders, pills, gums, candy, and liquid supplements. Generally, the athlete will take a loading dose of 20 g to 25 g per day in three to four doses for the first five days, and a maintenance dose of 2 g to 5 g per day thereafter.

Several studies have shown that creatine improves performance in repeated bouts of high-intensity strength work and repeated sprints, but its effects

on single sprint activity are uncertain, and it does not appear to enhance endurance exercise.

Some studies looking at the effects of creatine confirm the positive effect on performance and increased muscle mass, with increased fat-free mass and increased strength. Most athletes will gain one to three pounds the first week, and then increase four to five pounds in lean mass over the next two weeks. Typically, in six weeks there is an average of a ten-pound gain in lean muscle mass. Strength gains are equally representative of this. However, there are some studies that do not show such positive benefits to creatine use. An analysis of the studies suggests that individuals may vary in their response to creatine, and that supplementation appears to be less effective under certain circumstances.

While most studies do demonstrate some improvement of performance, this is not entirely universal, and it seems that there is a significant variation in response in different athletes. Typically, runners and swimmers have shown less consistent improvement, whereas football players generally think that creatine is quite helpful.

Side effects

Side effects are presently under investigation. At present the one demonstrated side effect of creatine supplementation appears to be weight gain. There have been some anecdotal reports of muscle cramps, strains, pulls and at times kidney problems.

The long-term effects of creatine use on the kidney and liver are unknown. The kidneys do clear much higher levels of creatine than normal because they, along with the pancreas, stops making androgynous creatine during supplementation.

Over

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Potential cardiac problems with cardiac muscle hypertrophy have been identified. The long-term effect of this is also poorly understood.

With all of the confusion out there, what should patients, parents and coaches do?

It is clear mega-doses of creatine do not provide muscle gains and further tax the kidneys and liver in ridding the body of this excess creatine. There is only a certain amount of creatine the muscles can absorb. One should be worried that there are no long-term studies on the effect of younger, growing children and the long-term effects of chronic usage of this are really not known.

If a person is taking creatine, they should be counseled on the following:

1. Creatine may or may not improve performance, but it probably will cause weight gain and other side effects that are not well-known.
2. Kidney, liver and cardiac status should be monitored.
3. Follow the generally accepted dosage.
4. During the very hot season when dehydration is a concern, or with weight loss in wrestling, creatine should be avoided.

As with most new wonder drugs, creatine certainly has its pros and cons. However, creatine supplements at the present time are not banned by the International Olympic Committee or the National Collegiate Athletic Conference. In addition, dietary supplements are not required by current law to meet FDA safety standards. Therefore, purity comes into play as well.

If you have further questions on this subject or would like additional information, please feel free to contact AthletiCare, as we have a growing library with articles on creatine.