

Creatine Supplementation and Youth

Introduction

Creatine is a natural substance produced and stored in the human body and used by the muscles to produce energy. Creatine is also supplied to the body through diet, primarily from ingestion of meats. The body naturally maintains a fairly constant level of creatine in order to supply the energy working muscles need to produce high intensity muscle contractions necessary for activities such as weight lifting, jumping, sprinting, etc. Supplemental creatine has been shown to increase the body's levels of creatine leading to increases in strength, performance and muscle size when compared to diet alone.

Currently regular use of creatine monohydrate as a performance enhancing supplement is widespread mainly because over the last 15 years and in over 500 clinical trials, CM supplementation has been shown to be a safe and effective aid for the majority of serious strength and performance athletes.

Youth Athletes

Pre-high school athletes have no reason to use creatine supplementation (CMS) to improve performance. First of all, only serious competitive strength & performance athletes are potential candidates for the use of CMS, which eliminates the vast majority of all athletes including youth, as most would be considered “recreational athletes”. Second, pre-high school athletes are still rapidly developing children that when training and eating properly for growth and maximum performance, including the use of pre & post exercise/activity nutrition bars or shakes (see Building a Professional Athlete), can maximize their athletic potential without the use of any purported performance enhancing supplements. And finally, up to and through puberty*, children are rapidly developing in all areas, with puberty being an especially unique and important phase. Facts on how any medications, excessive intakes of any single nutrient or food, perceived as healthy or not, are all unknowns as it relates to pubescence. Therefore dietary supplementation of any kind other than a multiple vitamin and mineral formula, pre & post activity snacks as mentioned above, or a specific recommendation by a qualified health professional, should be discouraged until the completion of puberty.

*According to the National Institute of Health (NIH), puberty generally happens for girls between ages 10-14 years and 12-16 for boys.

dotFIT Experts Position on Creatine Use By Young Athletes

There is unequivocal evidence that a limited number of natural substances prepared and ingested properly can safely improve training induced size or performance for many athlete.^{1,2}

Historically however, athletes have had the tendency of not following directions. Many subscribe to the old adage “if a little works, more is better.” The practice of overconsumption of anything—such as foods, dietary compounds, and drugs—can lead to problems. On the other

hand, proper supplementing for performance has been shown to often generate truly remarkable benefits including helping prevent or recover from injury, and this in itself can save many athletes from turning to illegal anabolic steroid use, which has well-known deleterious side effects.

The dotFIT experts offer no recommendations regarding the use of creatine by athletes under the age of 18. The decision for strength high school athletes to incorporate creatine into their daily diets should be one made together with the player and their parents after gaining an understanding of the compound and its related effects. (For the science and efficacy of CMS see the dotFIT SRG excerpt on CreatineMonohydrate).

Position of the International Society of Sports Nutrition (ISSN) on the use of creatine supplementation

It is the position of the International Society of Sports Nutrition that the use of creatine as a nutritional supplement within established guidelines is safe, effective, and ethical. Despite lingering myths concerning creatine supplementation in conjunction with exercise, CM (creatine monohydrate) remains one of the most extensively studied, as well as effective, nutritional aids available to athletes. Hundreds of studies have shown the effectiveness of CM supplementation in improving anaerobic capacity, strength, and lean body mass in conjunction with training. In addition, CM has repeatedly been reported to be safe, as well as possibly beneficial in preventing injury. Finally, the future of creatine research looks bright regarding the areas of transport mechanisms, improved muscle retention, and treatment of numerous clinical maladies via supplementation.

ISSN Position on Creatine Use in Children and Adolescents

Opponents of creatine supplementation have claimed that it is not safe for children and adolescents.³ While fewer investigations have been conducted in using younger participants, no study has shown CM to have adverse effects in children. In fact, long-term CM supplementation (e.g., 4 – 8 grams/day for up to 3 years) has been used as an adjunctive therapy for a number of creatine synthesis deficiencies and neuromuscular disorders in children. Clinical trials are also being conducted in children with Duchenne muscular dystrophy.^{4,5} However, as less is known about the effects of supplemental creatine on children and adolescents, it is the view of the ISSN that younger athletes should consider a creatine supplement only if the following conditions are met⁶:

1. The athlete is past puberty and is involved in serious/competitive training that may benefit from creatine supplementation;
2. The athlete is eating a well-balanced, performance enhancing diet;
3. The athlete and his/her parents understand the truth concerning the effects of creatine supplementation;

4. The athlete's parents approve that their child takes supplemental creatine;
5. Creatine supplementation can be supervised by the athlete's parents, trainers, coaches, and/or physician;
6. Quality supplements are used; and,
7. The athlete does not exceed recommended dosages.

If these conditions are met, then it would seem reasonable that high school athletes should be able to take a creatine supplement. Doing so may actually provide a safe nutritional alternative to illegal anabolic steroids or other potentially harmful drugs. Conversely, if the above conditions are not met, then creatine supplementation may not be appropriate. It appears that this is no different than teaching young athletes' proper training and dietary strategies to optimize performance. Creatine is not a panacea or short cut to athletic success. It can, however, offer some benefits to optimize training of athletes involved in intense exercise in a similar manner that ingesting a high carbohydrate diet, sports drinks, and/or carbohydrate loading can optimize performance of an endurance athlete.

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 - 3 Metzl JD, Small E, Levine SR, Gershel JC. Creatine use among young athletes. *Pediatrics*. 2001 Aug;108(2):421-5.
 - 4 Felber S, Skladal D, Wyss M, Kremser C, Koller A, Sperl W. Oral creatine supplementation in Duchenne muscular dystrophy: a clinical and 31P magnetic resonance spectroscopy study. *Neurol Res*. 2000 Mar;22(2):145-50.
 - 5 Tarnopolsky MA, Mahoney DJ, Vajsar J, Rodriguez C, Doherty TJ, Roy BD, Biggar D. Creatine monohydrate enhances strength and body composition in Duchenne muscular dystrophy. *Neurology*. 2004 May 25;62(10):1771-7.
 - 6 Kreider RB: Creatine in Sports. In *Essentials of Sport Nutrition & Supplements* Edited by: Antonio J, Kalman D, Stout J, et al. Humana Press Inc., Totowa, NJ; 2007 in press.