

# Does Evidence Support the Use of Performance-Enhancing Supplements in Youth Sports? A Qualitative Review of Literature and Policy

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## Introduction

Doctors of chiropractic (DCs) see approximately 10% of the US population in a given year making them among the most visited practitioners outside of conventional medicine for general health problems and especially back and neck conditions.<sup>1,2</sup> In addition, one of the fastest growing areas of specialty treatment is in the area of sports injury. Today, most professional teams, the US Olympic Team, and many college or high school sports programs have a DC either on staff or available to treat athletes as part of the sports medicine team.<sup>3,4</sup> There are also specialty programs for training of DCs in the area of sports medicine as well as pediatric care.<sup>5</sup>

Current research available from the National Board of Chiropractic Examiners (NBCE) and other studies that have assessed the nutritional recommendations made by DCs indicates that nutritional supplementation is a large part of many chiropractic practices.<sup>2,6,7</sup> Evidence also indicates an increasing incidence of spinal problems for adolescents in general.<sup>8</sup> With this will likely come an increase in numbers of adolescents seeing DCs for sports related injuries and other back-related health conditions.

The purpose of this paper is to describe the use of nutritional supplements for enhancement of sports performance in young athletes along with any national policies that exist related to this topic. This will benefit DCs treating young athletes as they seek to improve clinical outcomes and assist those athletes in their efforts to improve at sports.

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## Background

In 2008-09, almost 8 million athletes participated in organized high school sports, the largest group of participants to date.<sup>9</sup> Additionally, over 44 million youth athletes play in organized leagues each year in the United States.<sup>10</sup> The experiences of youth participating in sports are seen through a societal lens as beneficial for growth and physical and personal development and are generally encouraged. These experiences however can differ greatly based on competitive level, length of season, cost to competitors, qualifications of coaches and officials, and skill level of athletes. Given this, it is crucial that information about health related areas such as sports nutrition be accurate and based on protection of the young athlete's health, rather than performance. Misinformation in the general media and consumer marketing by sports nutrition companies, namely dietary supplement manufacturers, can cause coaches, parents, and athletes to be confused about using these products, at times resulting in unhealthy and potentially dangerous nutritional practices. While proper nutrition is one factor that can contribute to making sports a positive experience for adolescents and is recommended by most national nutritional organizations, supplementing the diet of healthy young athletes with performance enhancers is generally not warranted. This paper will overview the proper precautions health professionals, including DCs, need to take when discussing performance enhancing dietary supplements. It will also review national policy statements by leading organizations in the field regarding performance enhancers with a focus on an athlete's health and not performance.

## Performance-Enhancing Dietary Supplements and Young Athletes

The popular notion exists that for active athletes, extra emphasis should be placed on supplementing the diet with products that promise to enhance performance. Athletes, coaches, (and parents) are often lured by promises made by over-the-counter dietary supplement manufacturers, particularly those marketed as sports supplements. Claims

of increased lean muscle mass, speed, endurance, fat loss, and recovery appeal to athletes across all sports, and coaches often emphasize that dietary supplements are a necessary training tool. In one national study, of 414 high school and college coaches surveyed, 87% believed dietary supplements to be safe, and 80% of coaches surveyed spoke to their athletes regularly about supplements. With 92% of coaches surveyed believing that more athletes were turning to dietary supplements than ever before, approximately 77% said they often or sometimes recommended supplements. Perhaps most alarming, when asked where coaches obtained the latest studies and information about dietary supplements, 77% of coaches said magazines, newspapers, and websites.<sup>11</sup> In reality, little if any evidence suggests that a healthy athlete in training needs to go outside current recommended nutritional requirements for active young adults. That has not stopped this issue from becoming one that is hotly debated, both within the nutrition and sports industries, and within society in general.

Traditional sports aside, there is a growing trend among young athletes to compete in extreme sports such as skateboarding, wakeboarding, surfing, bodyboarding, snowboarding, and inline skating. Another clear trend is the increase in females participating at every level of sport. The National Youth Council reports that female participation in youth sports increased in every age group other than the 16-to-18 year old age group while male participation has decreased in every age group other than the 16-to-18 year old age group.<sup>10</sup> In 1972, one in 27 females participated in high school sports; by 2001, that figure had grown to 1 in 2.5, an increase of more than 800%.<sup>10</sup> With this growth trend it is very concerning that data on use of sport supplement products by females is almost unknown. With such a potential pool of athletes, it is little wonder that the CDC reports a 300% increase in anabolic steroid use of among youth under 18 years of age.<sup>12</sup> Among published reasons for use, young athletes report improving performance, muscle development, treating illness, helping with growth, and combating tiredness.<sup>13</sup> Influences on use by young athletes consistently cite parents, peers, coaches, the media, professional athletes, health food stores, and health clubs or gyms.<sup>13</sup>

Current levels of legislative oversight have allowed sport supplement products to flourish. In 1994 the Dietary Supplement Health and Education Act (DSHEA) was passed; and, with very few changes, is still in effect today.<sup>14</sup> A crucial outcome of the DSHEA was that ingredients found in dietary supplement products were now exempt from premarket evaluations for efficacy and safety that were required for new food ingredients. Once products become

available for consumer use, the Food and Drug Administration (FDA) is tasked with addressing complaints and reports of adverse effects. The burden of proof is placed on the FDA, not on the manufacturer, to identify dietary supplement ingredients that may cause harm to the user. Until recently, the consumer of these products was asked to assume that safety standards have been met by the supplement maker and not by any federal agency. New Current Good Manufacturing Practice (CGMP) regulations in August of 2007 will help to improve the quality of ingredients in these products.<sup>15</sup>

The dietary supplement industry is a rapidly growing market. Based on industry sales data from 1994 to 2000, sales of dietary supplements have been increasing at an annual average rate of 12% per year across all product categories.<sup>16</sup> In 2008 the dietary supplement industry saw profits of \$25.2 billion dollars of which sports supplement products accounted for 2.2 billion.<sup>17</sup> There are estimates of 30,000 dietary supplement products currently on the market; what part of that number are sports supplement products is difficult to estimate.<sup>18</sup>

While the national debate plays out in the scientific and athletic arena, the focus of concern remains on the scarcity of long-term clinical evidence to support dietary supplement products in young athletes for performance reasons or otherwise. Creatine, the most popular dietary supplement today and a household word had total sales of \$400-500 million in 2006.<sup>19</sup> While creatine is currently not banned by any organized sports agency and athletes are not tested for use, there are concerns regarding its use by young athletes. Highly researched, creatine has been the subject of well-controlled studies to gauge its effectiveness as an ergogenic aid. Almost all experimental studies have been on adult athletes. Few clinical trials exist for healthy athletes under the age of 18; rarely would an institutional review board agree to test a non-prescription product with healthy subjects under the age of 18 "just to see what happens." This holds true for sport supplements as a whole; sadly there are products that are targeted to "athletes" as young as four years old.<sup>20</sup> From a health care standpoint, this is highly unethical. In May of 2007, the state of New Jersey took the ultimate step in proposing the banning of the sale or distribution of creatine and other similar performance-enhancing substances to minors. This New Jersey law was approved by the Senate Law, Public Safety, and Veterans Affairs Committee.<sup>21</sup>

## Policy Statements

As the debate over the use of performance-enhancing

supplements continues, national organizations representing both health care professionals and young athletes have weighed in with policy statements on this topic. In 2004 the American Academy of Pediatrics began a discussion on Performance-Enhancing Substances, and subsequently published a policy statement entitled "Use of Performance-Enhancing Substances".<sup>22</sup> In 2004 the AAP wrote:

*"The temptation of using performance-enhancing drugs and supplements as shortcuts to improving athletic performance or even to enhance appearance is very seductive to adolescents. Pediatricians need to rely on research when available, stay current on trends in athletes' drug and supplement use, and discuss the individual athlete's concerns when they arise. A reasonable strength and conditioning program and a well-balanced diet must be presented as a sensible alternative to a riskier shortcut training approach. It is important to recognize that release and widespread use of new supplements often occur before significant clinical study of benefit and adverse effects takes place. Virtually no data are available on the efficacy and safety of widely used performance-enhancing substances in children and adolescents. **The American Academy of Pediatrics strongly condemns the use of performance-enhancing substances and vigorously endorses efforts to eliminate their use among children and adolescents.**"<sup>22, p.1</sup>*

Focused mainly on athletes under the age of 18, the subsequent policy's major recommendation was that use of performance-enhancing substances for athletic or other purposes should be strongly discouraged. Among the position paper's strongest points was the recognition that these substances may pose a significant health risk to younger individuals. The position paper also encouraged parents, coaches, and school and sports organizations to stress whole, nutritious foods to young athletes, and to seek out appropriate professional and clinical resources regarding this issue.<sup>23</sup>

The National Federation of State High School Associations is the national leadership organization for high school sports in the US and represents 185,000 high schools and over 11 million students involved in athletic and activity programs. Their Sports Medicine Advisory Committee Position Statement on Supplements<sup>24</sup> clearly articulates their philosophy:

*"The NFHS Sports Medicine Advisory Committee (SMAC) strongly opposes the use of dietary*

*supplements for the purpose of athletic advantage. Research data shows widespread use of dietary supplements by adolescent and high school athletes, despite considerable safety concerns. Dietary supplements are marketed as an easy way to enhance athletic performance, increase energy levels, lose weight, and feel better. It is proven that adolescents are more susceptible to advertising messages and peer pressure, increasing the risk of dietary supplement usage. This can create a culture more concerned about short term performance rather than overall long term health.*

*The NFHS SMAC discourages the use of supplements by athletes due to the lack of published, reproducible scientific research addressing the benefits and documenting long term adverse health effects of the supplements, particularly in the adolescent age group. Dietary supplements should be used only upon the advice of one's health care provider. School personnel and coaches should never recommend, endorse or encourage the use of any dietary supplement, drug, or medication for performance enhancement.*

*We recommend that coaches, athletic directors, and school personnel develop strategies that address the growing concerns of using dietary supplements. Such strategies may include conversations with athletes and their parents about the potential dangers of dietary supplement use. Athletes should be encouraged to pursue their goals through hard work and good nutrition, not dietary shortcuts."<sup>24, p.1</sup>*

The National Collegiate Athletic Association (NCAA)<sup>25</sup> also has a strict policy regarding performance enhancing products among its student-athletes.

*"An institution may only provide permissible non-muscle-building nutritional supplements to a student-athlete for the purpose of providing additional calories and electrolytes. Permissible nutritional supplements do not contain any NCAA banned substances and are identified according to the following classes: Carbohydrate/electrolyte drinks, energy bars, carbohydrate boosters and vitamins and minerals."<sup>25, p. 201</sup>*

Policies such as these provide clear and salient arguments against recommending performance enhancing supplements to youth athletes. When the athlete's health is considered to be the top priority, the ethical and scientific

evidence provides the final critical piece of the debate.

### Recommendations for Clinicians

Until such time that the DSHEA allows for greater regulation of sports supplements, nutrition and sport personnel should proactively and collectively discourage their use, and encourage use of whole foods as part of a training regimen. The following three recommendations from the AAP are particularly useful for DC's when working with young athletes:

1. Inquiries about the use of performance-enhancing substances should be made in a manner similar to inquiries about use of tobacco, alcohol, or other substances of abuse. Guidelines for patient confidentiality should be followed and explained to the patient.
2. The pediatric health care professional providing care for an athlete who admits to using a performance-enhancing substance should explore the athlete's motivations for using these substances, evaluate other associated high-risk behaviors, and provide counseling on safer, more appropriate alternatives for meeting fitness or sports-performance goals.
3. Pediatric health care professionals should promote safe physical activity and sports participation by providing or making available sound medical information on exercise physiology, conditioning, nutrition, weight management, and injury prevention and by helping to care for sports related medical conditions and injuries.

Clinicians treating adolescents involved in sports should always take a complete history on the patient including a detailed history related to drug and supplement history. Should the patient report use of sport supplements, the clinician must discuss the potential dangers of the products and should include the parent in the conversation as well. Dialogue related to why an athlete is taking the product may open up an opportunity to discuss healthy eating and a diet conducive to healthy sport participation.

In addition to warning the athlete and parents about potential dangers in use of sport supplements, messaging related to safe play and safe return to play after injury will be a part of any advisory role the DC may have with this subset of athletics. Partnership with school superintendents, athletic directors, athletic trainers, coaches and parents groups to educate about the use of these products should be

**Table 1. Websites and Resources for Clinicians**

• American Academy of Pediatrics	<a href="http://www.aap.org">www.aap.org</a>
• The National Center for Drug Free Sport	<a href="http://www.drugfreesport.com">www.drugfreesport.com</a>
• National Collegiate Athletic Association (NCAA)	<a href="http://www.ncaa.org">www.ncaa.org</a>
• National Federation of State High School Associations	<a href="http://www.nfsh.org">www.nfsh.org</a>
• American College of Sports Medicine	<a href="http://www.acsm.org">www.acsm.org</a>
• American Medical Society for Sports Medicine	<a href="http://www.amssm.org">www.amssm.org</a>
• Consumer Lab (Independently tests dietary supplements and reports findings)	<a href="http://www.consumerlab.com">www.consumerlab.com</a>
• The National Athletic Trainers Association	<a href="http://www.nata.org">www.nata.org</a>

an area the DC can work. However, parents, coaches, and some DCs may be advising the use of sport supplements and this may provide a barrier to accomplishing guidelines or restrictions on their use. A list of helpful websites and resources can be found in Table 1.

### Conclusion

There is substantial evidence to discourage use of performance enhancers by young athletes. Furthermore, health care professionals have an ethical obligation to promote healthful practices among young adults; in this regard evidenced-based recommendations must take precedence over consumer trends. Given that playing youth sports is regarded as a positive activity in a young person's life and should be encouraged, adults who can have an impact on healthful decisions should do so with the young athletes' best interest in mind. DCs should be familiar with the most accepted policies on use of sport enhancing products, ask athletes about their use, and advise them to avoid these substances whenever possible.

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