AMERICAN ACADEMY OF PEDIATRICS

POLICY STATEMENT

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

Committee on Sports Medicine and Fitness

Use of Performance-Enhancing Substances

ABSTRACT. Performance-enhancing substances include dietary supplements, prescription medications, and illicit drugs. Virtually no data are available on the efficacy and safety in children and adolescents of widely used performance-enhancing substances. This statement is intended to provide a generalized but functional definition of performance-enhancing substances. 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. *Pediatrics* **2005;115:1103–1106;** ***ergogenic, anabolic, performance enhancing, banned substance, athlete, adolescent, sport.***

INTRODUCTION

Performance-enhancing substance use in young people is a concern to pediatricians and society because of potential adverse health consequences and the effects that such practices have on moral development of the individual and on fair athletic competition for all. Health care professionals can play a valuable role in counseling the young person using or contemplating use of performance-enhancing substances by conveying factual information about the proven benefits and medical consequences of these substances and providing advice about healthful eating and training. Attempts to discourage use through scare tactics or by dismissing known performance-enhancing effects of these substances may seriously damage the credibility of the physician and do little to diminish use. Efforts to minimize use of performance-enhancing substances require the pediatrician to have an understanding of the incentives for use, a comprehensive definition of performance-enhancing substances, and familiarity with strategies for prevention.

INCENTIVES FOR THE USE OF PERFORMANCE-ENHANCING SUBSTANCES

The temptation for young people to use performance-enhancing substances should be easily understood by anyone who is familiar with high-level sports in our society. Success (that is, winning) is considered by many to be the most important goal of sports. At the level of professional sports, winning is the ultimate goal. This attitude permeates lower levels of sports as well, down to youth sports. Society rewards success in sports with celebrity, status, and favoritism.

For athletes of all ages, the pursuit of excellence in sports is an endeavor to be admired and encouraged. Success in sports involves obtaining an "edge" over the competition. However, sometimes the drive for success can be so engrossing and so compelling that a young person can easily lose sight of what is fair and right. Some individuals may view the use of performance-enhancing substances as a substitute for hard work. For others, performance-enhancing substances may be considered a necessary adjunct to hard work or part of the price of success. From the user's perspective, the prospects for success in sports often outweigh the prospects for serious medical complications from use of performance-enhancing substances.

For some, winning has a monetary incentive as well. The enormous salaries paid to professional athletes in the United States and elsewhere are powerful inducements for a young person with outstanding athletic talent to try anything to ensure continued athletic success.

Adolescents may be uniquely vulnerable to the lure of performance-enhancing substances. Many adolescents engage in risk-taking behavior and experimentation at a time when they are coping with the developmental tasks of adolescence, including defining their sexual identity, emancipating themselves from their families, achieving a sense of mastery and self-efficacy, and finding a peer group with which they can identify.[1] The adolescent, by nature, feels invincible and often shuns any suggestion that use of a substance for purposes other than legitimate therapy might pose a danger to their health or their eligibility for sports.

Adolescents are also intensely preoccupied with body image. Personal rewards perceived from enhancing size, strength, stamina, or body build can be strong motivators. A significant number of adolescents who are not involved in competitive athletics use performance-enhancing substances.[2]

The child athlete, particularly the adolescent, in today's society is caught in a struggle between ideals highly valued by society but often in direct conflict: the attitude of winning at all costs and the values of fairness and wholesomeness.

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RATIONALE FOR A BROAD-BASED STATEMENT ON PERFORMANCE-ENHANCING SUBSTANCES AND YOUTH

In the last 2 decades, a considerable amount of research has been conducted with performance-enhancing substances such as creatine, amino acids, androstenedione, and dehydroepiandrosterone. Virtually no experimental research on either the ergogenic effects or adverse effects of performance-enhancing substances has been conducted in subjects younger than 18 years. The amount of scientific data from well-designed studies on the effects of these substances in adults continues to accumulate at such a rate that systematic reviews are soon made obsolete.

This statement is not intended to provide a review of currently available data on performance-enhancing substances. A list of resources for detailed information on specific performance-enhancing substances is provided at the end of this statement. Rather, this statement is intended to convey a more general policy on the basis of the following 3 points. First, the intentional use of any substance for performance enhancement is unfair and, therefore, morally and ethically indefensible. Second, use of any substance for the purpose of enhancing sports performance, including over-the-counter supplements, the composition and quality of which are not under federal regulation, may pose a significant health risk to the young person. Third, use and promotion of performance-enhancing substances tends to devalue the principles of a balanced diet, good coaching, and sound physical training.

CURRENT DEFINITIONS OF PERFORMANCE-ENHANCING SUBSTANCES

Limitations of Current Definitions

Traditionally, sports organizations such as the International Olympic Committee and the National Collegiate Athletic Association have defined performance-enhancing substances as substances that create an unfair competitive advantage. These organizations have produced lists of banned or prohibited drugs that include substances with known performance-enhancing effects as well as substances used by athletes that have been associated with adverse health effects. Detection of illegal or banned substances by drug testing is a critical element of the enforcement and efficacy of these policies. However, current definitions of performance-enhancing substances have contextual limitations. If the substance does not have adverse medical consequences, if the substance is not detectable by drug testing, or if testing for the drug is not performed (so that a potentially dangerous substance or unfair practice may go undetected), then the substance in question would not be included in a list of banned substances.

To date, there is no definition of performance-enhancing substances that applies to all potential users. A definition of a performance-enhancing substance that is applicable to the pediatric age group should not exclude any individual who may have a substance-abuse problem or any substance that cannot be readily detected. With the prohibitive cost of testing and deficiencies associated with a detection-based banned list, widespread drug testing of children and adolescents is unlikely to be effective or practical. A definition of a performance-enhancing substance for the pediatric age group, therefore, must be independent of whether testing of the substance is conducted in that age group. Because new substances for performance enhancement as well as methods for masking the presence of these substances are continually being discovered, a definition of performance-enhancing substances must remain valid in a changing environment.

General Definition of Performance-Enhancing Substances

A performance-enhancing substance is any substance taken in nonpharmacologic doses specifically for the purposes of improving sports performance. A substance should be considered performance enhancing if it benefits sports performance by increasing strength, power, speed, or endurance (ergogenic) or by altering body weight or body composition. Furthermore, substances that improve performance by causing changes in behavior, arousal level, and/or perception of pain should be considered performance enhancing.

Performance-enhancing substances include the following:

- Pharmacologic agents (prescription or nonprescription) taken in doses that exceed the recommended therapeutic dose or taken when the therapeutic indication(s) are not present (eg, using decongestants for stimulant effect, using bronchodilators when exercise-induced bronchospasm is not present, increasing baseline methylphenidate hydrochloride dose for athletic competition)
- Agents used for weight control, including stimulants, diet pills, diuretics, and laxatives, when the user is in a sport that has weight classifications or that rewards leanness
- Agents used for weight gain, including over-the-counter products advertised as promoting increased muscle mass
- Physiologic agents or other strategies used to enhance oxygen-carrying capacity, including erythropoietin and red blood cell transfusions (blood doping)
- Any substance that is used for reasons other than to treat a documented disease state or deficiency
- Any substance that is known to mask adverse effects or detectability of another performance-enhancing substance
- Nutritional supplements taken at supraphysiologic doses or at levels greater than required to replace deficits created by a disease state, training, and/or participation in sports

STRATEGIES FOR PREVENTING USE OF PERFORMANCE-ENHANCING SUBSTANCES

The methods most widely used to prevent use of performance-enhancing substances, namely drug bans and drug testing, are primarily punitive. Drug

bans imposed by organizations that regulate and oversee sports programs at various levels, from the International Olympic Committee to the National Collegiate Athletic Association and state high-school sports associations, effectively make the use of such substances "against the rules." Enforcement of drug bans has necessarily involved the use of drug testing, with positive tests carrying stiff penalties or sanctions including loss of playing privileges, removal of awards or championships from the entire team, loss of scholarships, and restrictions on future regular-season and postseason play.[3] Drug testing and legal sanctions are intended to be deterrents but have little effect on most children and adolescents involved in sports.

Neither the use of drug bans nor the implementation of drug testing provides the young athlete with any framework or guidelines for resolving the conflict between the drive to win and the imperative to do the right thing.

A variety of programs educating young athletes about substance abuse in general and targeting specific performance-enhancing drugs such as anabolic steroids have been tested at the international, collegiate, and even high-school levels.[4] It is unfortunate that few evaluations of these programs have included measurement of continued drug use after the intervention, and programs appropriately studied have not been highly successful in curbing use. One program that combined drug education with training in personal skills to resist the social influences that drive the use of performance-enhancing substances was successful in decreasing the intention to use anabolic steroids among adolescent football players.[5]

Little effort has been made to target adults who are responsible for collegiate, high-school, middle-school, and youth sports programs. Permissiveness often has the same effect as active encouragement when it comes to using performance-enhancing substances. A "don't-ask" attitude should be as intolerable to parents as the provision of performance-enhancing substances to athletes by coaches would be.

IDENTIFICATION OF THE YOUNG PERSON USING PERFORMANCE-ENHANCING SUBSTANCES

Data from epidemiologic studies and case descriptions have provided information about users of performance-enhancing substances that can help pediatricians to identify them. Users of anabolic or androgenic compounds are more likely to be male; are more likely to be involved in sports that demand high levels of strength, power, size, and speed; and are likely to use other illegal substances such as tobacco and alcohol.[5–7] Young people who participate in sports that demand leanness are also more likely to use performance-enhancing substances than are those involved in sports in which leanness is not essential. Young men and women who are not competitive athletes but who are obsessed with body image and who train intensely primarily to improve their physique are also more likely to use performance-enhancing substances. Users of certain performance-enhancing substances might be identified by outward signs such as virilization in females, testicular atrophy in males, and mood changes produced by anabolic steroids. Unfortunately, most young people who use performance-enhancing substances are not readily identified by outward signs. Therefore, it is imperative that all adolescents be asked about use of performance-enhancing substances in the assessment of high-risk behaviors that should be a part of every adolescent health maintenance visit, including sports physicals, camp physicals, and all other scheduled physician-adolescent encounters.

RECOMMENDATIONS

To assist the pediatrician in dealing with users or potential users of performance-enhancing substances, the American Academy of Pediatrics offers the following recommendations:

1. Use of performance-enhancing substances for athletic or other purposes should be strongly discouraged.
2. Parents should take a strong stand against the use of performance-enhancing substances and, whenever possible, demand that coaches be educated about the adverse health effects of performance-enhancing substances.
3. Schools and other sports organizations should be proactive in discouraging the use of performance-enhancing substances, incorporating this message into policy and educational materials for coaches, parents, and athletes.
4. Interventions for encouraging substance-free competition should be developed that are more positive than punitive, such as programs that teach sound nutrition and training practices along with skills to resist the social pressures to use performance-enhancing substances.
5. Colleges, schools, and sports clubs should make use of educational interventions that encourage open and frank discussion of issues related to the use of performance-enhancing substances, with the aim of promoting decisions about personal drug use based on principles of fair competition and character rather than on the fear of getting caught.
6. Coaches at all levels, including youth sports, should encourage wholesome and fair competition by emphasizing healthy nutrition and training practices, taking a strong stand against cheating, and avoiding the "win-at-all-costs" philosophy.
7. 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.
8. Athletes who admit using performance-enhancing substances should be provided unbiased medical information about benefits, known adverse effects, and other risks. When appropriate, additional testing may be necessary to investigate or rule out adverse medical effects.
9. The pediatric health care professional providing care for an athlete who admits to using a perfor-

mance-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.

10. Nonusers of performance-enhancing substances should have their decisions reinforced while establishing an open channel of communication if questions about performance-enhancing substances arise in the future.
11. 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.

The November 2004 issue of "Sports Shorts" by the American Academy of Pediatrics Section on Sports Medicine and Fitness concerning performance-enhancing substances[8] is available for download and includes guidelines for pediatricians and parents.

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*Lead author

REFERENCES

1. Tanner SM, Miller DW, Alongi C. Anabolic steroid use by adolescents: prevalence, motives, and knowledge of risks. *Clin J Sport Med.* 1995;5:108–115
2. Terney R, McLain LG. The use of anabolic steroids in high school students. *Am J Dis Child.* 1990;144:99–103
3. National Collegiate Athletic Association. NCAA enforcement and student-athlete reinstatement. Indianapolis, IN: National Collegiate Athletic Association. Available at: www.ncaa.org/enforcefrontF.html. Accessed January 12, 2005
4. Yesalis CE, Barhke MS. Doping among adolescent athletes. *Baillieres Best Pract Res Clin Endocrinol Metab.* 2000;14:25–35
5. Goldberg L, Elliot D, Clarke GN, et al. Effects of a multidimensional anabolic steroid prevention intervention. The Adolescents Training and Learning to Avoid Steroids (ATLAS) Program. *JAMA.* 1996;276:1555–1562
6. Bahrke MS, Yesalis CE, Kopstein AN, Stephens JA. Risk factors associated with anabolic-androgenic steroid use among adolescents. *Sports Med.* 2000;29:397–405
7. Kindlundh AM, Isacson DG, Berglund L, Nyberg F. Factors associated with adolescent use of doping agents: anabolic-androgenic steroids. *Addiction.* 1999;94:543–553
8. American Academy of Pediatrics, Section on Sports Medicine and Fitness. Sports shorts: performance-enhancing substances. Available at: www.aap.org/family/sportsshorts12.pdf. Accessed January 12, 2005

RESOURCES

United States Anti-Doping Agency. Available at: www.usantidoping.org. Accessed January 6, 2004

National Federation of State High School Associations. Sports medicine. Available at: www.nfhs.org/scriptcontent/va_Custom/VimDisplays/contentpagedisplay.cfm?content_id=203. Accessed January 6, 2004

National Collegiate Athletic Association. Banned drug list. Available at: http://www1.ncaa.org/membership/ed_outreach/health-safety/drug_testing/banned_drug_classes.pdf. Accessed January 6, 2004

American Medical Society for Sports Medicine. Drugs and performance-enhancing agents in sport. *Clin J Sport Med*. 2002;12(theme issue):201–263

Gomez JE. Performance-enhancing substances in adolescent athletes. *Tex Med*. 2002;98(2):41–46

Metzl JD. Performance-enhancing drug use in the young athlete. *Pediatr Ann*. 2002;31:27–32

Ahrendt DM. Ergogenic aids: counseling the athlete. *Am Fam Physician*. 2001;63:913–922

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