

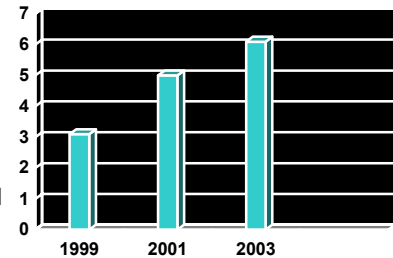
Program on Adolescent Hormone Abuse and Performance-Enhancing Drugs

The Problem

The abuse of performance-enhancing drugs among adolescents is a growing cause for concern. These substances – used to boost athletic performance, increase strength and improve appearance – present a serious health risk. According to *Monitoring the Future*, an annual national survey sponsored by the National Institute of Drug Abuse, past year use of steroids reported by 12th graders is at its highest level. Currently, anabolic steroids are the only substances that are increasing in use among teens, while other drugs have either leveled off or declined in use.

The Centers for Disease Control and Prevention (CDC) *Youth Risk Behavior Surveillance System* also reports that lifetime use of illegal steroids increased between 1991 and 2003 among students in grades 9 through 12. Nationwide, 6.1% of students had taken steroid pills or injections without a doctor's prescription one or more times during their lifetime. This has increased from 3.1% in 1999 and 5% in 2001. Although males are more likely to have used illegal steroids without a prescription than females, 9th grade female use is the highest reported user group (7.3%).

Although anabolic-androgenic steroids are controlled substances, they are illegally imported or manufactured in clandestine labs. Many are available on the Internet. Newer “designer” steroids recently have been discovered. Veterinary steroids are another source – often cheaper and easier to obtain. Gyms and sports training centers are thought to be the major point of purchase for many users.



Substances of Concern

Anabolic-androgenic steroids: e.g., Anadrol (oxymetholone), Dianabol (methandrostenolone), Winstrol (stanozolol), DecaDurabolin (nandrolone), Oxandrin (Oxandrolone), and Depot-Testosterone.

Other Substances: Human Growth Hormone; hormone precursors (e.g., androstenedione, DHEA), ephedra, EPO (erythropoietin) and darbopoeitin.

A variety of other widely available substances, sold as dietary supplements, are used to enhance athletic performance, although very little is known about prevalence of use. Anabolic steroid precursors, notably androstenedione, have gained increasing popularity as athletic enhancing supplements in recent years. These precursors, which include 4-androstenediol, norandrostenedione and norandrostenediol, currently are available without prescription and have powerful hormonal effects in men and women. Evidence exists that the effects are not unlike using anabolic androgenic steroids. Anabolic steroid precursors are being marketed as anabolic-equivalent “dietary supplements” that promise to increase muscle mass.

Other supplements include ephedra, also known as *ma huang*. Ephedra is often used as a weight loss supplement. The FDA reports that ephedra's use has been associated with

at least 100 deaths, and multiple adverse cardiovascular and cerebrovascular events. The effects of ephedra can be exacerbated by exercise and use of other stimulants such as caffeine. Sale of the drug is prohibited in Illinois and New York, as well as Canada, the United Kingdom and Germany. Other states, including Massachusetts, Nebraska, New Jersey and Hawaii are considering banning this substance. Currently, ephedra alkaloids remain available in many supplement stores and gyms throughout the United States.

Health Effects

The use of anabolic steroids by adolescents is especially troubling. Young, developing bodies are likely more sensitive to the adverse health effects of steroids, some of which may be irreversible.

Effects include acute acne, balding, and undesirable body changes such as the development of breasts (gynecomastia) and shrinking testicles in men, and masculinization in women (e.g., more body hair, a deeper voice, smaller breasts and fewer menstrual cycles). Use may increase the risk of heart attacks and strokes by elevating blood pressure and cholesterol levels. In adolescents, whose bones are still growing, use may result in stunted growth. Oral steroids have been linked to liver disease, and evidence exists for increased risk of prostate, liver and kidney cancer. Steroids are often injected, increasing the risk of contracting serious infections among those who share needles (e.g., hepatitis, HIV). Although long-term studies are scarce, it is thought that some harmful effects may not appear until many years after these substances have been abused. Evidence suggests that the abuse of steroids can increase aggressive behavior in males (a phenomenon known as “roid rage”), cause mood swings and impair judgment. Studies have reported an association between steroid use and use of other substances, including heroin.

What's at Stake?

Physical activity is an essential ingredient of a healthy lifestyle, particularly for youngsters. Sports are an integral part of American culture. Sports figures are among the most prevalent icons in America, and serve as role models for many young people. Team sports can build skills in cooperation and competition, and sports performance can enhance self-esteem. For young women, “body image” is a powerful motivator, often based on inappropriate entertainment and media models. Unfortunately, the use of performance-enhancing substances is believed to be widespread among adult sports figures.

Easy access to performance enhancing drugs, combined with these factors of popular culture, presents a complex and increasingly serious problem, the dimensions of which have not been fully investigated.

What's Being Done

The Endocrine Society and The Hormone Foundation are working to build public awareness about the issue of adolescent hormone abuse through:

- The publication of scientific and educational articles on the abuse of anabolic steroids and other performance-enhancing substances
- Passage of legislation to ban the over-the-counter sale of dietary supplements containing steroid precursors
- Experts who can provide testimony on the dangers of dietary supplements and other performance-enhancing substances
- Relationships with government, private and non-profit organizations to galvanize the issue of adolescent hormone abuse
- Recommendations and promotion of educational programs targeted at youth with substantial prevention efficacy
- Scientific experts who can make recommendations about areas of research that are needed on the physical and psychological effect of hormone abuse

The Endocrine Society's Advocacy Program

The Endocrine Society's Government Relations Committee has identified hormone abuse as a legislative priority and has taken several steps to help prevent abuse through legislative and regulatory advocacy. The Society and The Hormone Foundation joined with the United States Anti-Doping Agency (USADA) and others to co-found the Coalition for Anabolic Steroid Precursor and Ephedra Regulation (CASPER). CASPER is an advocacy group comprised of the nation's leading medical, public health and sport organizations, and is focused on supporting efforts to regulate products containing steroid precursors and products containing ephedra.

On October 29, 2004, the President signed The Anabolic Steroid Control Act of 2004 into law. The Society-supported measure amends the Anabolic Steroid Control Act of 1990 to modify the definition of "anabolic steroid" to include tetrahydrogestrinone (THG), androstenedione, and specified related chemicals. This alternation will allow these substances to be regulated as controlled substances rather than dietary supplements. The bill also awards grants to enable organizations to carry out science-based education programs in elementary and secondary schools to highlight the harmful effects of anabolic steroids. In addition, The Endocrine Society and The Hormone Foundation have been called on to provide testimony before Congress regarding the medical impact of steroids, anecdotal steroid usage reports and the effectiveness of various education programs.

The Hormone Foundation Program on Adolescent Hormone Abuse

For the last five years, The Hormone Foundation, the public education affiliate of The Endocrine Society, has worked to develop a national program on adolescent hormone abuse by mobilizing the resources – the people, the knowledge and the skills – needed to prevent the use of performance-enhancing drugs and hormone abuse by adolescents.

This first step in a multi-stage program to develop and implement a national initiative on the prevention of adolescent hormone abuse was in November 2002, when the Foundation brought together a group of government, academic, non-profit and private organizations to develop a clear understanding of the challenges in addressing adolescent hormone abuse, and to agree on the most effective ways to move forward – both short and long term.

In 2003, the Foundation, in conjunction with The Endocrine Society, joined the CASPER coalition to support steroid precursor legislation banning the over-the-counter sale of dietary supplements containing steroid precursors, which led to the passing of the Steroid Control Act in June of 2004. Later that year, the Foundation published a bilingual fact sheet entitled, *Anabolic Steroids and Young Adults (Journal of Clinical Endocrinology & Metabolism, August 2004)* to educate physicians and their patients about the dangers of hormone abuse.

This year, The Hormone Foundation, The Endocrine Society and the AMA's Council on Scientific Affairs published a scientific review article entitled, *Hormone Abuse in Adolescents and Adults: A Review of Current Knowledge (The Endocrinologist, May/April 2005)*. The purpose of the study was to summarize data on hormone abuse, including prevalence, performance enhancement, adverse effects, and interventions. Later this year the Foundation will be publishing a bilingual fact sheet on how to identify adolescent abuse of performance-enhancing substances; advocate for funding for prevention programs; continue to provide expert testimony on Capitol Hill and for the media; and develop a public education program, in conjunction with two successful prevention programs, ATLAS and ATHENA, to prevent the abuse of anabolic steroids and performance-enhancing substances in middle school and high school.

Program Leadership

The Hormone Foundation's Hormone Abuse Program Advisory Council

- Lisa H. Fish, MD, Park Nicollet Clinic (Chair)
- Linn Goldberg, MD, Oregon Health and Sciences University
- Alan Rogol, MD, PhD, University of Virginia
- Dan Spratt, MD, Maine Medical Center Research Institute

The Endocrine Society's Governmental Affairs Committee

- Dan Spratt, MD, Maine Medical Center (Chair)
- Michael Ashcraft, MD, former California legislative staff
- Lisa Fish, MD, Park Nicollet Clinic
- Myron Genel, MD, Yale University
- Joan Jorgensen, DVM, PhD, University of Illinois
- Paul Komesaroff, MD, Monash University, Australia
- Thomas Landefeld, MS, PhD, California State Univ. Dominguez Hills
- Elizabeth Rappaport, MD, DuPont Hospital for Children
- Leonard Wartofsky, MD, Washington Hospital Center
- Robert Zimmerman, MD, Cleveland Clinic

The Hormone Foundation – Established in 1997 by The Endocrine Society as its public education affiliate, the Foundation is an independent, non-profit organization, dedicated to serving as a resource for the public by promoting the prevention, treatment and cure of hormone-related conditions. For more information visit www.hormone.org or call Paula Correa at 1-800-HORMONE

The Endocrine Society – Founded in 1916, the Society is the world's oldest, largest, and most active organization devoted to research on hormones, and the clinical practice of endocrinology. Today, The Endocrine Society's membership consists of over 11,000 scientists, physicians, educators, nurses and students, in more than 80 countries. Together, these members represent all basic, applied, and clinical interests in endocrinology. To learn more about the Society, and the field of endocrinology, visit www.endo-society.org or contact Chris Rorick at 301-941-0254.