



Supplements, Steroid Precursors, and Adolescent Health

WHAT ARE STEROID PRECURSORS?

Anabolic steroid precursors (also called prohormones) are substances that the body can convert into anabolic steroids. Anabolic steroids are a class of natural and synthetic (man-made) substances related to the male sex hormone testosterone.

Anabolic means "building muscle." Anabolic steroids promote muscle growth and can make bones stronger and reduce body fat. Also, all anabolic steroids are androgenic. This means they cause male features, such as facial hair and a deepened voice. However, anabolic steroid precursors can also be converted into the female hormone estrogen. When this occurs, men's breasts can enlarge.

DID YOU KNOW?

Steroid precursors can have unhealthy side effects that are long lasting and may even be permanent.

Until recently, steroid precursors were advertised and sold as dietary supplements to improve athletic performance and body image. Use of these products by professional athletes and bodybuilders made them popular among young people who wished to be like those role models.

Many of these products are now illegal in the U.S. without a doctor's prescription, because steroid precursors can have unhealthy side effects. DHEA, which is banned by the National Football League and Major League Baseball, is the only steroid precursor that is available without a prescription.

Though most dietary supplements with steroid precursors are not available over the counter, it is possible to buy them illegally. Some of these products are contaminated, fake, or labeled incorrectly. Sometimes, supplements contain steroids or precursors without listing them on the label. In 2007, HFL Sport Science, a sports doping control and research laboratory, analyzed supplements often used by athletes in the U.S. The analysis found that one in four supplements contained anabolic steroids that were not listed on the manufacturer's label.

Commonly used anabolic steroid precursors include

- Androstenedione (or "andro")
- Androstenediol
- Norandrostenedione
- Norandrostenediol
- Dehydroepiandrosterone (DHEA)

WHO IS USING STEROID PRECURSORS?

The Centers for Disease Control and Prevention (CDC) reports that, since 2003, about one in 20 high school students have admitted using anabolic steroids without a prescription. Although boys are more likely than girls to use steroids, girls are increasingly using these drugs.

Boys tend to use steroids or steroid precursors to improve their athletic performance or look more muscular. Girls tend to use them for weight loss, self-defense, and body image as much as athletics. Non-athletes may use steroids as often as teens who are involved in sports.

WHAT ARE THE RISKS OF USING STEROID PRECURSORS?

Like anabolic steroids, the use of steroid precursors may have unhealthy, long-lasting effects. The higher the dose, the more severe the health effects. Some of these side effects go away once you stop using steroid precursors, while others do not. In growing young people, a main risk of using anabolic steroid precursors is the permanent stunting of height.

SIDE EFFECTS OF ANABOLIC STEROID PRECURSORS	
In boys	<ul style="list-style-type: none"> • Uncontrolled aggressive behavior ("roid rage") • Hair loss (permanent) • Breast enlargement (permanent) • Shrunken testicles • Reduced sperm production
In girls	<ul style="list-style-type: none"> • Deeper voice (permanent) • Enlarged clitoris (permanent) • Growth of facial hair (permanent) • Hair loss (permanent) • Fewer menstrual cycles • Smaller breasts
In boys and girls	<ul style="list-style-type: none"> • Psychological symptoms (mood swings, irritability, poor judgment) and depression after stopping steroids (which has been linked to suicide) • Problems sleeping • Possible drug dependence • Severe acne • Increase in blood pressure • Blood clots • Liver abnormalities • Cholesterol problems • Infections from sharing needles (HIV/AIDS, hepatitis) if steroid precursors are injected

HOW DO YOU KNOW IF SOMEONE IS USING ANABOLIC STEROID PRECURSORS?

Parents, coaches, and health care providers should know the possible warning signs of steroid abuse. These can include

- Behavioral, emotional, or psychological changes, especially increased aggressiveness
- Changes in body build (noticeable muscle growth and greater development of the upper body)
- Increased acne
- Needle marks in the large muscles (buttocks, thighs)
- Enlarged breasts in boys and decreasing breast size in girls

If you suspect steroid abuse, talk about it with the teen. The best approach may be to discuss both the possible positive effects of steroids and the dangerous and often lifelong consequences of steroid use. Most important, give teens healthy options to reach their body image goals, such as proper sports nutrition and physical training.

Questions to ask your doctor

- How can I help my teen find healthy ways to enhance his/her athletic performance?
- Could my teen's health problems be due to taking steroid precursors?
- How long will the changes to my teen's body last after he/she stops taking steroid precursors?
- Should my teen see an endocrinologist (hormone specialist)?

RESOURCES

- Find-an-Endocrinologist: www.hormone.org or call 1-800-HORMONE (1-800-467-6663)
- Hormone Health Network hormone abuse information: www.hormone.org/abuse
- National Institute on Drug Abuse (NIDA) for Teens: teens.drugabuse.gov
- U.S. Food and Drug Administration: www.fda.gov
- ATLAS (Athletes Training & Learning to Avoid Steroids) Program: www.atlasprogram.com
- ATHENA (Athletes Targeting Healthy Exercise & Nutrition Alternatives) Program: www.athenaprogram.com

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The Hormone Health Network offers free, online resources based on the most advanced clinical and scientific knowledge from The Endocrine Society (www.endo-society.org). The Network's goal is to move patients from educated to engaged, from informed to active partners in their health care. This fact sheet is also available in Spanish at www.hormone.org/Spanish.

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www.hormone.org