Testimony

Before the Committee on Government Reform
United States House of Representatives

Consequences of the Abuse of Anabolic Steroids

Statement of

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For Release on Delivery
Expected at 9:30 am
Thursday, March 17, 2005

Mr. Chairman and members of the Committee:

Thank you for inviting the National Institute on Drug Abuse (NIDA), a component of the National Institutes of Health, to participate in this important hearing. As the world's largest supporter of biomedical research on drug abuse and addiction, we have learned much about the behavioral and health effects of anabolic steroids. I am pleased to be here today to present an overview of what the science has taught us about anabolic steroids, their health effects and what we can do to prevent their abuse.

Recently, we have been hearing a great deal about the abuse of anabolic steroids by professional athletes, many of whom are regarded as role models by today's youth. Anabolic steroids are synthetic versions of the primary male sex hormone, testosterone. They promote the growth of skeletal muscle and the development of male sexual characteristics. People choose to take steroids because they do, in fact, enhance certain types of physical performance and appearance. This practice is not new-- athletes in many sports have abused substances in an attempt to gain competitive advantage. This occurs despite the severe and often irreversible adverse health consequences to those taking these drugs.

Anabolic steroids are available legally only by prescription, to treat conditions that occur when the body produces abnormally low amounts of testosterone, such as delayed puberty and some types of impotence. They are also prescribed to treat body wasting in patients with AIDS and other diseases that result in loss of lean muscle mass. People who

take anabolic steroids usually inject them or take them orally. It is important to realize that the doses taken by those who abuse these drugs are supraphysiological; that is, they are much larger than what the body normally produces for healthy function. The main visible result of this drug taking is an increase in the size of skeletal muscle; abusers can clearly be seen to "get bigger." Today, men and women, including adolescents, abuse a variety of drugs, such as anabolic steroids, in the hope of improving their athletic performance and appearance.

At NIDA, we are especially concerned about the non-prescribed, non-supervised use of anabolic steroids, as well as other prescription medications, since abusing these drugs can lead to serious health problems, some irreversible. People who abuse anabolic steroids, particularly those involved in weight training, will experience increases in strength and muscle size significantly beyond those observed from training alone. However, there are long-term health risks associated with steroid abuse that can be very serious and potentially life threatening. Younger steroid abusers, both male and female, are at risk of permanently halting their bone growth, which could result in shorter stature than nature had intended. Males may experience a shrinking of their testicles, reduced sperm count, infertility, baldness, development of breasts, and an increased risk for prostate cancer. In females, anabolic steroids have been associated with a number of adverse effects, some of which appear to be permanent even when drug use is stopped, including menstrual abnormalities, deepening of voice, shrinkage of breasts, male-pattern baldness, and an increase in sex drive, acne, body hair and clitoris size. For both genders, other consequences include liver and heart disease, stroke, drug dependence, and increased

aggression. In addition, people who inject anabolic steroids run the added risk of contracting and/or transmitting HIV/AIDS or hepatitis through sharing contaminated needles.

What are we doing about it?

NIDA has as its primary mission to lead the nation in bringing the power of science to bear on drug abuse and addiction. We accomplish this in two ways: We support and conduct basic, clinical, and applied research on all health aspects of drug abuse and addiction; and we ensure rapid and effective dissemination and use of research results to improve prevention and treatment and to advise policy.

NIDA supports a focused research portfolio to develop knowledge on the health effects of steroid abuse, with the ultimate goal of more effectively preventing abuse and/or reversing its consequences. Our basic research is designed primarily to help us better understand how anabolic steroids affect the brain and behavior. For example, NIDA is supporting research on anabolic steroid-induced aggression. So-called "roid rage" is one of the prominent symptoms that has been reported in some anabolic steroid abusers. In fact, we already know from animal studies that anabolic steroids can induce aggression. NIDA is supporting the use of animal models of anabolic steroid-induced aggression to help us better understand the brain circuitry that is responsible for these abnormal behaviors and determine how this circuitry is affected by exposure to anabolic steroids. Our goals are to find treatments that would mitigate the adverse effects associated with

anabolic steroid abuse and to better understand how anabolic steroid abuse harms the body and negatively affects brain chemistry.

Anabolic steroids are different from other drugs of abuse in that many of their "reinforcing effects", i.e., those effects that keep a person using a drug, are not experienced immediately or rapidly. The main reason people give for abusing steroids is to improve their performance in sports or their appearance, that is, to increase their muscle size and/or reduce their body fat. These effects take time to develop, although once developed may be a strong incentive for continued anabolic steroids abuse.

Some percentage of steroid abusers become addicted to the drugs, as evidenced by their continuing to take steroids in spite of seriously adverse medical and behavioral problems. One of the most dangerous consequences is the severe depression that can occur during withdrawal which if not recognized and treated properly can result in suicide weeks after drug discontinuation. Indeed untreated, depressive symptoms have been known to persist for a year or more after the abuser stops taking the drugs.

NIDA researchers have also investigated factors that increase an individual's likelihood of abusing anabolic steroids. Among these is a unique syndrome which NIDA researchers identified and termed "muscle dysmorphia." It involves a preoccupation with physique, poor insight into actual body size or weight, rigid dietary practices, and impairments in social or occupational functioning. It has been described in both females and males who train with weights, and it is more common in those who abuse anabolic

steroids. More research is needed to characterize this syndrome further, to determine who is most vulnerable, and to develop potential treatments.

Success Story in Developing Science-based Prevention Programs: Projects ATLAS and ATHENA

NIDA has always been a strong proponent of prevention research, and began in 1993 to fund researchers at the Oregon Health and Science University to develop a program for preventing steroid abuse and improving health behaviors in high school students. The researchers chose to develop separate programs for males and females. The interventions are called Athletes Training and Learning to Avoid Steroids (ATLAS) and Athletes Targeting Healthy Exercise and Nutrition Alternatives (ATHENA)--both ATLAS and ATHENA demonstrate that sports teams can be effective vehicles to promote healthy lifestyles and deter drug abuse and other harmful behaviors. Their format uses influential coaches and existing, single-gender bonded peer groups to deliver immediately relevant information and messages. The research shows that incorporating peer-led drug abuse prevention and health promotion curricula into sport team settings is effective, and can be used in communities across the country. In fact, when the Congress amended the Controlled Substances Act last year to focus on steroid abuse, ATLAS and ATHENA were specifically mentioned as model programs.

Scope of the Problem

The number of people abusing anabolic steroids nationwide is not known at this time. Many of the abused substances only became illegal with the passage last year of the

amendments to the Controlled Substances Act; therefore, up until then some forms of anabolic steroids (usually steroid precursors) could be purchased legally in health food and other commercial establishments or through the Internet. More information needs to be obtained on the true magnitude of abuse.

NIDA supports the conduct of a nationwide survey, Monitoring the Future (MTF), which annually collects information on drug abuse and attitudes about drug risk among the Nation's 8th, 10th, and 12th grade students. MTF has been collecting information on anabolic steroid abuse in youth since 1989 in high school seniors and since 1991 in all three grades. The Centers for Disease Control and Prevention also conducts a biennial survey of students in grades 9 through 12, the Youth Risk Behavior Survey (YRBS), which includes questions on anabolic steroids. Note that although both surveys query overlapping age groups of students, they are designed differently and results may therefore differ. In 2003, according to YRBS, 6.1% of students reported illegal use of anabolic steroids at least once in their lifetime, up from 2.7% in 1991.

The most recent MTF survey found that, in 2004, past year steroid abuse among 12th graders was holding steady, but at peak levels of about 2.5%. This translates into an estimated 79,000 high school seniors who report having abused anabolic steroids in the past year. Perception of harm among 12th grade students has also been holding steady for the past few years at approximately 56%, which is down from a peak of 71% in 1992. When students view drugs as less harmful their levels of abuse often increase. We are

encouraged, though, by the fact that the survey also found abuse by 8th graders within the past year declined, from 1.4% in 2003 to 1.1% in 2004.

This encouraging news regarding 8th graders contrasts with what we saw a few years ago. In late 1999, we learned from the MTF that anabolic steroid abuse had increased among 8th and 10th graders, and that the perceived risk of harm from anabolic steroid abuse had declined among 12th graders. These were troubling signs and NIDA responded by enhancing our public education efforts related to the adverse consequences of steroid abuse.

NIDA partnered with multiple individuals and organizations to develop a public education campaign on the dangers of anabolic steroid abuse. Among those involved were the American College of Sports Medicine, the National Collegiate Athletic Association, and the National Federation of High Schools. NIDA created a new website: www.steroidabuse.org, prepared *a Community Drug Alert Bulletin* for health care professionals (more than 150,000 distributed), and developed a Research Report to inform the public on the state of science regarding anabolic steroid abuse (more than 500,000 distributed). NIDA also distributed 390,000 free postcards on the health risks of anabolic steroids directing the public to NIDA's website for further information.

In 2002, with the winter Olympics on the horizon, we re-invigorated our public education efforts by launching "Game Plan," which included additional materials (posters, web banner advertisements, print advertisements) and public service television

announcements. We worked with organizations across the country to especially target high school and collegiate athletic associations and all of their members. Between February 2002 and February 2003, a public service campaign advertisement, developed as a part of NIDA's steroid abuse prevention initiative, was aired by 228 television stations (located in 130 cities). It played almost 25,000 times! We will be re-airing these PSAs in 2005. In 2003, NIDA also distributed more than 166,000 art cards to 81 locations nationwide (surf, ski, skate shops and health clubs), including metropolitan areas, beach resorts, and ski resorts, and worked with Scholastic Inc. to develop an article, "Steroids: Behind the Bulk", for their magazine series, entitled *HEADS UP*: Real News About Drugs and Your Body. This magazine has an estimated reach of 6.8 million middle and early high school students.

Conclusion

The research clearly indicates that inappropriate use of anabolic steroids can have serious health consequences. In light of recent publicity on this issue, we must be vigilant to educate young people that these are dangerous drugs and need to be viewed that way. This is a particularly important problem since not all anabolic steroid abusers experience the same deleterious outcomes, and many serious problems require months or years to develop, which could lead to conflicting street messages. NIDA is actively working to ensure that realistic messages are conveyed in a convincing manner regarding anabolic steroids and the serious harms they can cause. We will continue to work to promote this message, to work with the appropriate groups to facilitate the adoption of proven effective prevention programs, such as ATLAS and ATHENA, and to develop

effective interventions to help those who are suffering from the damaging effects of steroid abuse.

Thank you for allowing me to share this information with you. I will be happy to answer any questions you may have.