

Changing the Way We Think About Appearance and Performance-Enhancing Drugs

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An estimated 2.9 to 4.0 million Americans take anabolic androgenic steroids, derivatives of testosterone to build muscle, and a recent analysis suggests that roughly one million people, almost entirely men, are dependent on these substances.¹ The health impacts of steroids and other substances taken to boost exercise performance and muscle mass, including poorly regulated diet and workout supplements available on the Internet or over the counter, can be very serious; yet their use remains a hidden problem, one that has gotten lost amid the myriad public health concerns related to other more classic drugs of abuse.

Various factors have served to conceal the problem of steroid use and its health consequences. People are unlikely to disclose their use to health-care providers, and since many users start after their teens, steroid use is less likely than other kinds of drug use to be detected by parents or teachers or show up on surveys. The relative recency of the phenomenon of non-athletes using these substances also means that

long-term health consequences are still somewhat unclear.² In addition, since deaths related to steroid use may be reported as due to proximal causes like heart attack, there is likely to be an underreporting of the risk. Thus we still lack an accurate estimate of how many young lives are being claimed or put at risk by performance enhancers.

Misconceptions about the way these drugs are used and who uses them have also contributed to the problem's invisibility. Steroids are mainly associated with athletes, and the common designation "performance enhancing drugs" sends the signal that these substances are mainly problematic because they are a form of cheating in sport, not because of the risks they pose to the user's health. High-profile cases like Lance Armstrong's 2012 admission of doping after decades of denial or Maria Sherapova's recent ban from tennis for using a cardiac performance enhancer give the impression that these substances are mainly used by elite athletes (of both sexes) who appear otherwise to be models of physical health and achievement, just to gain an edge in competition.

The fact is, the vast majority of users are male non-athlete bodybuilders aiming to enhance their appearance. Use of performance-enhancing drugs

is strongly tied to problems related to male body image.³ Users often exhibit a preoccupation with the perceived inadequate size of their muscles, a type of body dysmorphic disorder. Thus some organizations, such as the Taylor Hooton Foundation, are recommending using the term "appearance and performance enhancing drugs" or APEDs to highlight this strong link with body image.⁴

Most performance enhancers are different from more familiar drugs of abuse that directly affect the brain's reward areas, like opioids. The latter can lead to dependence and addiction in part by altering the user's sensitivity to reward and stress and reducing the brain's ability to inhibit impulses.

Steroids do not affect the same brain regions or directly produce a euphoric surge of dopamine, but dependence may come about through other pathways including a range of neuroendocrine effects and through their interaction with a user's body image.² Their association with the world of sports and fitness — and the fact that some performance-enhancing substances are sold legally as health supplements —

gives them a misleading veneer of safety that most other drugs of abuse do not have.

In fact, the consequences of steroid and other performance-enhancing drug use over time can be profound and devastating.^{2,5} Cardiovascular effects of regular steroid use include atherosclerotic disease and, at high doses, dangerous thickening of the heart muscle, raising risk for heart attack in users who otherwise would not be at risk. Risk may be magnified when using steroids in conjunction with stimulants, a common workout practice. Steroids are toxic to other organ systems as well, including the liver and kidneys, and liver cancer may be associated with prolonged steroid use.⁵

Shrinking of male sex organs (hypogonadism) while periodically cycling off steroids to manage tolerance or following attempts to quit can also have psychologically devastating effects.² Alterations of mood, both in response to such body changes and as a direct consequence of the neuroendocrine effects of these drugs, can be profound: Manic or hypomanic symptoms, such as the extreme aggression sometimes called 'roid rage, are experienced by some users and contribute to a wide range of other risky behavior; conversely, steroid withdrawal can lead to depressive symptoms and thoughts



of suicide. Recent research in animal models and human users also suggests that prolonged steroid use is neurotoxic and might produce permanent deficits in brain areas involved in visuospatial memory.²

Awareness of the issue of male body-image disorders in our society has lagged behind that of corresponding issues in women. The 1983 death of singer Karen Carpenter from complications of anorexia and abuse of an over-the-counter emetic shined a spotlight on eating disorders and dangerous weight-loss practices. But just as girls' and women's body dysmorphia are driven by unrealistic portrayals of the female form everywhere from Barbie dolls to fashion magazines, male body-image issues underlying APED use must be viewed in the context of GI Joe and comic book and action movie heroes that have shown increasingly exaggerated physiques over the past three decades.³

Counselors and clinicians face a number of unique challenges around use of APEDs. Foremost is getting patients to admit using these substances. Commonly voiced is the view that steroid users are "cheating at life" by using steroids to help build muscle. Thus APEDs are associated with their own unique form of stigma

— different from the stigma than attaches to most other drugs.

When a person has developed dependence on a drug, it is often insufficient and in some cases unsafe to simply advise abstinence without offering supports for withdrawal, and this is also true with steroids. The hypogonadism and depression that may result from steroid discontinuation contribute to risk of relapse and other potential outcomes like suicide. Hormone treatments like estrogen feedback blockers, human chorionic gonadotropin, or testosterone-replacement therapy can be used to medically manage hypogonadism,² and antidepressant medications and behavioral therapy are available to help treat associated depression. Steroid use may also be comorbid with eating disorders and with other substance use disorders, which also need to be addressed in a comprehensive treatment plan.

In a society that increasingly celebrates exaggerated male physiques, the issue of APEDs and the body-image issues that surround their use by young men remain oddly invisible. Outside of gym and athletic culture, most people simply don't realize that enormous muscles are often obtained with the help of harmful and often illegal substances that can severely endanger the

user's mental and physical health. It is important to remove the cloak of invisibility surrounding this issue.

ENDNOTES

¹Pope, HG, Kanayama, G, Atthey, A, Ryan, E, Hudson, JI, Baggish, A. (2014). The Lifetime prevalence of anabolic-androgenic steroid use and dependence in Americans: Current best estimates. *The American Journal on Addictions/ American Academy of Psychiatrists in Alcoholism and Addictions*, 23(4):371-377.

²Pope, HG, Wood, RI, Rogol, A, Nyberg, F, Bowers, L, Bhasin, S. (2014). Adverse health consequences of performance-enhancing drugs: An Endocrine Society scientific statement. *Endocrine Reviews*, 35(3):341-375.

³Pope, HG, Phillips, KA, Olivardia, R. (2000). *The Adonis Complex: The Secret Crisis of Male Body Obsession*. New York, NY: Free Press.

⁴Taylor Hooton Foundation. Retrieved at: <http://www.taylorhooton.org>.

⁵Nieschlag, E, Vorona, E. (2015) Doping with anabolic androgenic steroids (AAS): Adverse effects on non-reproductive organs and functions. *Reviews in Endocrine and Metabolic Disorders*, 16(3):199-211.



Dr. Jack Stein joined NIDA in August 2012 as the Director of the Office of Science Policy and Communications (OSPC). He has over two decades of professional experience in leading national drug and HIV-related research, practice, and policy initiatives for NIDA, the Substance Abuse and Mental Health Services Administration (SAMHSA) and the Office of National Drug

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