



# Anabolic-androgenic steroids: Considerations for forensic psychiatry, sports psychiatry, and the law

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## **Anabolic-androgenic steroids, sociolegal considerations, and anti-doping frameworks**

Image and Performance Enhancing Drugs (IPEDs) have become a worldwide public health concern, spanning high professional competitive environments and affecting recreational and non-elite sports [1]. Anabolic-androgenic steroids (AAS) tend to be the most common IPEDs, with Sagoe et al. estimating a global lifetime prevalence use rate of 3.3% (6.4% in males and 1.6% in females) [2]. Given these trends, researchers have portrayed AAS consumption as an international “epidemic” [3, 4, 5]. In part, usage rates may be driven by sociocultural factors, technological advancements, and the widening accessibility of these substances for athletes and the general public [3, 6]. Enduring stigmatisation surrounds AAS use, which can undermine trust in physicians, impair therapeutic programmes and educational initiatives, and amplify the role of non-medical experts [7, 8]. Studies suggest that people who use AAS believe that physicians have limited understanding about these substances, with perceived knowledge levels comparable to that of internet resources and even those who illicitly sell them [8]. Additionally, AAS consumption may occur for several years, leading to dependence and withdrawal symptoms that can prevent successful discontinuation [9].

Although the World Anti-Doping Federation and national anti-doping bodies have outlawed AAS use because of performance enhancing effects [6], elite-level

athletes still engage in harmful consumption. As anti-doping testing regimes have become more rigorous, use patterns of AAS in elite-level sport have increasingly centred around novel substances that are harder to identify [10]. Nevertheless, high-profile transgressions continue to be detected and often engender widespread press coverage. Anti-doping violations in elite-level competitions can carry lengthy sporting bans, and, in certain circumstances, may entail criminal or civil charges depending on the jurisdiction. However, in practice, the requisite burden of proof and the intricacies of anti-doping scenarios mean that formal judicial proceedings for AAS usage in elite-level sports seldom occur [11], and the legality of providing self-incriminating evidence through voluntary drug tests has been questioned [12].

Significantly, studies indicate that recreational athletes also consume AAS [1, 2]; Sagoe and Pallesen’s meta-analysis estimates an 18.4% prevalence rate of AAS usage amongst recreational athletes [13]. Anti-doping controls can affect these individuals and contingent on the sporting discipline, testing policies may encompass recreational competitors [14]. This regulatory expansion has previously been criticised as compromising health promotion initiatives and concomitantly endangering individual wellbeing [14]. Additionally, a lack of awareness about AAS substances can have major implications if anti-doping guidelines are adopted within recreational sports, along with potential severe health-related consequences for amateur athletes [14]. For Kayser et al., an overstated emphasis on anti-doping policies and testing regimes in elite-level competitions inhibits resource allocation for prevention and

harm reduction in other populations, where deleterious behaviours like needle sharing can occur [15].

From a jurisdictional perspective, applying extensive definitions of “sport” and anti-doping rubrics to amateur competitions may lead to adverse outcomes for recreational competitors, rendering them liable to legal proceedings and inadequate clinical support. Recently, Diethelm et al. highlighted how amateur athletes in Switzerland who consume AAS, together with their healthcare providers, are vulnerable to judicial proceedings because of far-reaching criminal law provisions [16]. Resultantly, these authors argue that ill-defined legislature can impede sufficient medical care and hinder the efficacy of treatment approaches [16].

## Forensic-psychiatric and medicolegal implications of AAS use

Scientific literature has illustrated the long-term risks of severe physical and psychiatric morbidities resulting from AAS exposure [17]. Specifically, from a mental health perspective, these might include elevated susceptibility to eating disorders and psychotic and addictive behaviours, alongside mood-altering pathologies, which could proceed to the development of affective disorders [17]. Further, studies have identified potential associations between AAS use and psychopathic personality traits, although evidence remains underdeveloped [18]. Moreover, adverse behavioural effects have been observed with possible forensic-psychiatric implications, including aggressiveness, hostility, and impulsivity [18]. In some situations, delinquency has been noted in relation to AAS consumption [19, 20]; this could include instances of violent crimes, such as homicides [21], and other weapons-related offences [19].

Nonetheless, empirical associations are not necessarily definitive and may be confounded by the notion that high-risk behaviour can be a prior factor amongst individuals who use AAS [22], along with a lack of evidence on the temporal order of violent acts and AAS exposure [23]. Additionally, primary causality is difficult to establish, especially as other substances may be used in conjunction with AAS [20], and premorbid mental health disorders, such as personality disorders for instance, can exist [24]. Notably, other substances used concurrently with AAS might include alcohol and illicit drugs [20], which also have associations with criminal offending (e.g., [25]).

Given these complexities, cross-jurisdictional questions remain as to how AAS consumption can shape medicolegal conceptions of criminal culpability in juridical processes [26]. Previously, in the United States, AAS use has been (unsuccessfully) adopted as a basis for the insanity plea [27]. Likewise, in the United Kingdom, doubts have been

expressed as to whether AAS exposure would constitute a viable defence [26]. In a civil law jurisdiction in Switzerland, the Federal Supreme Court has ruled similarly [28]. That said, in common law systems, “involuntary intoxication” can influence *mens rea* judgements in specific intent crimes and affect sentencing (this is not valid in “basic intent” cases) [29]. Specific offences constitute those requiring “an extra intent to achieve a specific consequence, in addition to the general intent to complete the act” and “proof of a mental state beyond simply intending to do an act” [29].

Whether “involuntary intoxication” might be relevant for AAS use is undetermined, but scholarly literature suggests that this is doubtful. Albeit improbable, Bidwill and Katz outline various conditions under which “involuntary intoxication” defences could apply to theoretical incidents of AAS-induced psychosis [27]. Within medical contexts, this may be pertinent when “intoxication resulted from a substance taken pursuant to a physician’s advice”, although the chances of this being successful are unlikely [26, 27]. Nevertheless, if they transpire, these situations could necessitate forensic-psychiatric involvement, together with wider issues of medical malpractice or charges for unlicensed prescriptions, depending on the circumstances. In other jurisdictions, diminished responsibility due to AAS consumption has been mooted as a defence for elite-level athletes (e.g., [30]). However, causality may be difficult to establish within criminal cases [26, 27], which could be further exacerbated by the medicolegal difficulties in determining whether the consequences of AAS use primarily resulted in disinhibition, thus contributing to the offence [31]. Should this be sufficiently substantiated, further sentencing complexities would arise concerning the extent to which AAS use has influenced notions of diminished capacity.

As we have noted, research has previously examined these topics, but we believe that more empirical data is needed on the causal relationship and temporal order between AAS exposure and criminal acts to better support appropriate legal outcomes [23]. Even so, we acknowledge that this may not solve the problem that offences can be committed whilst an individual is intoxicated with several substances that might interact. These situations are difficult to replicate under experimental conditions, complexifying causal inferences between AAS use and delinquency in cases where multiple substances are used concurrently.

## The importance of interprofessional and interdisciplinary collaborations

With the international prevalence of AAS consumption and the mental health consequences of these substances,

we believe this an area of substantial overlap encompassing sports psychiatry, forensic psychiatry, and criminal law, alongside addition specialists and additional clinical areas. Increased epistemological and medicolegal intersections between sports psychiatry and forensic psychiatry have been proposed in other domains [32]; for us, AAS consumption represents another shared interprofessional concern. Here, again, comprehensive knowledge exchanges could strengthen professional expertise and patient care. For example, on the one hand, sports psychiatrists can contribute broader context about AAS use patterns, demographic trends, and therapeutic approaches. This could inform forensic-psychiatric evaluations and risk assessments. Similarly, forensic psychiatrist can provide judicial insights, which may benefit treatment programmes and clinical decision-making. To strengthen mental health strategies for AAS use, both psychiatric subdisciplines should collaborate on tailored prevention programmes, accentuating the possible psychological effects and highlighting conceivable medicolegal implications.

Interdisciplinary dialogues should incorporate endocrinologists and sports physicians, as well as primary care physicians, who often fulfil gatekeeper positions as the first point of contact for AAS-related issues [7]. Harm reduction initiatives have been emphasised for individuals who use AAS [7, 23], which could be more holistically adopted into legal and drug policy structures; from a regulatory perspective, we believe that the specific frameworks of AAS consumption in recreational sport should inform the applicability of anti-doping guidelines for amateur athletes. Generally, policymakers and legal actors need to be better attuned to these wider considerations. This might prevent possible situations where an athlete and their healthcare provider are liable for juridical proceedings during treatment programmes, as has previously been observed [16]. In this regard, we believe that optimised legal provisions should involve the development or refinement of legislation to prioritise psychiatric care over punitive responses [16]. Further, to uphold patient wellbeing and avoid medicolegal recriminations, like medical malpractice sanctions, physicians must be vigilant of the potential psychiatric side-effects of AAS when prescribing these substances. Clinicians should adhere to internationally recognised guidelines, stipulating strict dosage considerations and medication schedules [33].

## Concluding remarks

Given the sociolegal contexts of AAS use and the complexities of anti-doping regulations and criminal law, these substances represent a pronounced interface for sports psychiatry, forensic psychiatry, and legal disciplines, along-

side other medical specialties. In the authors' opinion, the sizable prevalence of AAS consumption internationally, which encompasses both elite-level and recreational sports, and the potential psychiatric side effects demand collaborative and innovative approaches; these should emphasise individual wellbeing and improved care provisions. For us, such interactions are necessary to safeguard vulnerable individuals from severe mental health effects and strengthen applicable legal frameworks.

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