ACMD

Advisory Council on the Misuse of Drugs

Consideration of the Anabolic Steroids

September 2010

ACMD

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Home Secretary
The Secretary of State for Health

21st September 2010

Dear Secretary of State,

The Advisory Council on the Misuse of Drugs (ACMD) wrote to the Home Office in January 2008 and advised that the ACMD considered it expedient to provide you with a report on its consideration of anabolic steroid misuse. I have pleasure in enclosing a report on the 'Consideration of the Anabolic Steroids'.

The report has recommendations that are cross cutting and that will be relevant to policy areas in a number of government departments, particularly the Home Office and the Department of Health.

The enclosed report came about following the ACMD's increasing concerns at the use of anabolic steroids by the general public, and in particular young people. These substances have become 'popular' in relation to body building and image enhancement and there is some evidence that such use is increasing.

The purpose of the report was to consider the evidence of harms and provide advice on potential harm reduction mechanisms. The ACMD set out to consider the available evidence regarding anabolic steroid use/misuse, physical and social harms. The working group placed particular emphasis on the level of use/misuse among young people.

Although the focus of the report is the misuse and harms of anabolic steroids in the general public, the report acknowledges that anabolic steroids have been used by sportspeople in a number of well publicised cases and makes reference to this form of use.

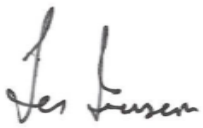
After considering the available evidence the ACMD recommend that - based on their harmfulness to individuals and society - anabolic steroids should continue to be controlled as Class C drugs under the Misuse of Drugs Act 1971. In addition, it is recommended that there continues to be no possession offence for personal use.

The ACMD recommend that the legal framework is strengthened so as to prevent importation of anabolic steroids not intended for medical use and that there is a greater emphasis placed upon education and interventions.

The report includes a number of research recommendations – the focus should be to obtain better information on prevalence and user demographics to inform interventions.

The production of this report has been greatly aided by valuable contributions from a wide range of organisations and experts. The ACMD is particularly grateful to those experts who provided written and oral evidence to the Working Group.

Yours sincerely



Professor Les Iversen

Cc:
Simon Burns MP - Minister of State for Health
James Brokenshire MP - Parliamentary under Secretary of State for Crime Reduction (Home Office)
Anne Milton MP - Parliamentary Under Secretary of State for Health
Edwina Hart MBE AM; Minister for Health and Social Services (Welsh Assembly)
Nicole Sturgeon MSP- Deputy First Minister of Scotland, Cabinet Secretary for Health and Wellbeing
Michael McGimpsey - Minister of Health, Social Services and Public Safety (Northern Ireland)

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Executive Summary

The ACMD consider that this report on anabolic steroids is timely due to its concerns regarding the harms of their use and the evidence that use of is increasing. The report provides recommendations concerned with harm reduction, the legislative framework and research. The report has a particular focus on use by young people.

Anabolic steroids are synthetic substances which are related to the male sex hormones, particularly testosterone. These substances have a number of physiological effects, most notably anabolic effects and androgenic effects.

The ACMD found that it remains difficult to determine how many people use anabolic steroids for non-medical reasons. The most comprehensive data on drug misuse for England and Wales are provided by the British Crime Survey which estimates that in the 16-59 year old age group around 226,000 people admitted to “ever” having used anabolic steroids, with 50,000 users in the past year, and 19,000 in the past month (Hoare and Moon, 2010).

The ACMD report a range of potential harms associated with the use of anabolic steroids; these include acne, cardiovascular symptoms, psychological (e.g. aggression, violence and hypomania) and hepatic dysfunction. In particular, harms to young people from the use of anabolic steroids can lead to virilization and potentially disrupt the normal pattern of growth and behavioural maturation.

The report considers the issue of substandard and counterfeit anabolic steroids, and outlines the potential harms associated with these.

The ACMD found in a recent report by the National Treatment Agency for Substance Misuse, that they note some [local drug partnerships] had seen an exponential rise in steroid use in recent years. In order to prevent the transmission of blood borne viruses, the ACMD recognises that drug users should have access to sterile injecting equipment.

The ACMD recommends anabolic steroids should continue to be controlled as Class C drugs under the Misuse of Drugs Act 1971. The ACMD considers the evidence base regarding the harms of anabolic steroids does not support a change in classification status. However, the ACMD recommends further restrictions should (if compliant with EU legislation) be placed on the importation (and exportation) exemption, namely personal custody on importation.

The ACMD recommends further restriction should (if compliant with EU legislation) be placed on the importation (and exportation) exemption, namely personal custody on importation; further the ACMD believes the term ‘medicinal product’ should be considered for removal from the legislation. The ACMD

consider that the term ‘medicinal product’ is now in need of revision as it believes that the term causes confusion

The ACMD further believes there is a need for widespread, credible, information and advice for users to counteract mis-information provided by various web sites that actively promote anabolic steroid use.

1. Background

1.1 The Advisory Council on the Misuse of Drugs (ACMD) is established under the Misuse of Drugs Act 1971. The ACMD's current membership is shown in Annex A. Additional experts also attended the ACMD's meetings to assist in the preparation of this report (Annex B).

1.2 The ACMD is required under the Misuse of Drugs Act 1971 *"to keep under review the situation in the United Kingdom with respect to drugs which appear to them likely to be misused and of which the misuse is having or appears to them of having effects sufficient to constitute a social problem"*.

1.3 Substances that are controlled under the Misuse of Drugs Act 1971 are grouped into one of three classes;

- Class A includes cocaine, diamorphine (heroin), 3, 4-methylenedioxymethylamphetamine ('ecstasy'), lysergic acid diethylamide (LSD), and methylamphetamine.
- Class B includes amphetamine, barbiturates, cannabis, codeine and methylphenidate.
- Class C includes benzodiazepines, buprenorphine, anabolic steroids, gamma-hydroxybutyrate (GHB) and ketamine.

1.4 This system of classification serves to determine the penalties for the possession and supply of controlled substances. The current maximum penalties are as follows:

- Class A drugs: For possession – up to 7 years' imprisonment and/or an unlimited fine; for supply – up to life imprisonment and/or fine.
- Class B drugs: For possession – up to 5 years' imprisonment and/or an unlimited fine; for supply – up to14 years' imprisonment and/or fine.
- Class C drugs: For possession – up to 2 years' imprisonment and/or an unlimited fine; for supply – up to 14 years' imprisonment and/or fine.

2. Previous consideration of the Advisory Council on the Misuse of Drugs

2.1 Following the ACMD's consideration of anabolic steroids in January 1993, in November 1994 the Home Secretary accepted the advice of the ACMD and confirmed that anabolic steroids would be brought under the control of the Misuse of Drugs Act as **Class C drugs under Part III of Schedule 2 of the Misuse of Drugs Act 1971**. They would also be subject to Schedule 4 of the Misuse of Drugs Regulations, but with additional import/export restrictions. It was to be an offence under the Act to produce, supply or possess/import/export **with intent to supply** without a licence.

2.2 In line with ACMD's advice, it is not to be an offence under the Act to simply possess anabolic steroids when in the form of a 'medicinal product'[1]. Article 1 of Directive 2001/83/EC *as amended* defines a "medicinal product" as:

(a) "Any substance or combination of substances presented **as having properties** for treating or preventing disease in human beings; *["the first limb"].*

(b) Any substance or combination of substances which may be **used in or** administered to human beings **either** with a view to restoring, correcting or modifying physiological functions **by exerting a pharmacological, immunological or metabolic action, or to making a medical diagnosis**" *["the second limb"].*

2.3 Changes to the definition which came into effect from 30 October 2005 are shown in **bold** to aid identification. Medicinal products may well fall under both limbs of the definition but the European Court of Justice has confirmed that falling under either limb is sufficient to classify a product as a medicinal product (Upjohn 1989 C-112/89): "Directive 65/65 (now Directive 2001/83) provides two definitions of the term "medicinal product": one relating to presentation, the other to function. A product is medicinal if it falls within either of those definitions."

[1] According to the Misuse of Drugs Regulations 2001 '"medicinal product" has the same meaning as in the Medicines Act 1968(f)' which is different from Directive 2001/83/EC. Either way it would still, subject to the interpretation by the Courts, be likely that substandard and counterfeit products be viewed as 'medicinal products', meaning that drug products manufactured in clandestine labs should be regarded as medicinal products. However, perhaps this section should reflect what is stated in the Misuse of Drugs Regulations 2001. See the following reference for a discussion: King, 2009. Forensic chemistry of substance misuse. A guide to drug control. RSC Publishing. p. 89-90.

2.4 In the absence of a simple possession offence, it was therefore considered to be anomalous and contrary to EU restrictions to make the importation or exportation of the substances for personal use an offence i.e. to have a stricter regime of controls at ports. Permitting importation for personal use was consistent with permitting simple possession inland. However, in all other circumstances importation and exportation would require Home Office authority, and such activity without a licence would be an offence.

2.5 In April 2008, the ACMD separately recommended that an additional 15 anabolic steroids and 2 non-steroidal substances be controlled under the Misuse of Drugs Act 1971. This advice was subsequently accepted by government; http://www.homeoffice.gov.uk/about-us/home-office-circulars/circulars-2009/021-2009/21-2009?view=Binary

3. Introduction

3.1 In November 2007, the Advisory Council on the Misuse of Drugs (ACMD) agreed that it would convene a specific working group to further consider its concerns around anabolic steroid misuse, particularly among young people. The ACMD wrote to the Secretaries of State at the Home Office, Department of Health, (the then) Department for Children, Schools and Families, Department for Culture, Media and Sport and the Minister for the Olympics, outlining the ACMD's concerns. The ACMD's correspondence cited the British Crime Survey of 2006/07 that estimated that 32,000 adults had used anabolic steroids in the last year and 14,000 in the last month (Drug Misuse Declared: Home Office Statistical Bulletin 18/07). Figures from the Department of Health's Smoking, Drinking and Drug Use Survey (2006) had shown a steady increase in the number of young people that had "ever" tried anabolic steroids from 0.2% in 2001-2004 to 0.3% in 2004/05 and 0.5% in 2006.

3.2 Anabolic steroids are synthetic substances which are related to the male sex hormones, particularly testosterone. These substances have a number of physiological effects, most notably anabolic effects (such as growth of skeletal muscle and bone) and androgenic effects (the differentiation, growth and maintenance of the reproductive system and sexual characteristics in males). The correct term to describe anabolic steroids is anabolic-androgenic steroids; however, they are commonly referred to as anabolic steroids.

3.3 Testosterone was initially isolated, characterised and synthesised in 1935. Subsequently a large number of congeners (related chemicals, e.g., elements in the same group of the periodic table, or derivatives thereof) have been synthesised. Some of these substances entered clinical use and have been used to treat conditions such as male hypogonadism, anaemia, to stimulate bone growth and to treat chronic muscle wasting conditions.

3.4 During the evidence gathering for this report the ACMD heard evidence from a range of experts about the harms associated with the self-administration of anabolic steroids (see Annex E)

4. Scope

4.1 The purpose of this report is to provide ministers with advice on anabolic steroids and associated harm reduction. The ACMD's remit, outlined in the Misuse of Drugs Act 1971, requires it to consider drugs in relation to their misuse and harms, both physical and social. The recommendations in this report are focussed solely on the misuse and harms of anabolic steroids in broader society - outside of their misuse in elite sport. However, the ACMD acknowledges this form of use (see chapter 12).

4.2 The ACMD has previously been requested by the Department of Culture, Media and Sport to consider 'The World Anti-Doping Code –The 2007 Prohibited List'. The recommendations concerning the WADA (The World Anti-Doping Agency) list are published on the ACMD website (see 2.5- link above).

5. Legislation

United Kingdom

5.1 Anabolic steroids are controlled as Class C substances under the Misuse of Drugs Act 1971, and scheduled under Schedule 4 Part II of the Misuse of Drugs Regulations 2001, both as named compounds (of which there are currently 69) and using a generic definition. The esters and ethers thereof are also controlled. The related drugs Clenbuterol (a β2-adrenergic agonist), Zeranol (nonsteroidal oestrogen), Zilpaterol (a β2-adrenergic agonist), Somatotropin (growth hormone of human origin), Somatrem (a synthetic analogue of human growth hormone), Somatropin (synthetic human growth hormone), [Human] Chorionic Gonadotrophin (HCG) and non-human chorionic gonadotrophin are also controlled. The stereoisomeric forms, salts, and related preparations and products of all these substances are also controlled.

5.2 Anabolic steroids have limited legitimate use in the UK. Clinically, their main use is in the treatment of male hypogonadism (where patients fail to produce sufficient levels of testosterone). They are prescription only medicines and can only be lawfully sold or supplied in accordance with a prescription from an appropriate practitioner. It is legal to possess or import/export anabolic steroids as long as they are intended for personal use and in the form of a medicinal product. However, the possession or import/export with intent to supply, supply, and manufacture is illegal unless authorised by a licence of the Secretary of State and could lead to 14 years in prison and an unlimited fine.

5.3 The definition of ‘medicinal product’ is one that appears to have caused confusion, particularly among users and enforcement. The ACMD has discussed the definition of ‘medicinal product’ which is defined in the Medicines Act 1968 and whether it has been harmonised to the current definition used in medicine law afforded by European Directive 2001/83/EC. Further, such definitional uncertainty has implications for personal possession offences where there is confusion between applying the term ‘medicinal product’ to only those substances that have received a marketing authorisation (i.e. to the exclusion of counterfeit products) or whether it should be applied in terms of the directive, i.e.:

> (a) Any substance or combination of substances presented as having properties for treating or preventing disease in human beings; or
>
> (b) Any substance or combination of substances which may be used in or administered to human beings either with a view to restoring, correcting or modifying physiological functions by exerting

a pharmacological, immunological or metabolic action, or to making a medical diagnosis.

5.4 From a public health perspective the confusion could act as a barrier and prevent users from engaging with health services: some users may think that the steroids they possess are unlawful as they are not 'medicinal products' (i.e. not legitimate as they have not been granted a marketing authorisation and/or might be counterfeits). Moreover, for enforcement, the application of a strict definition of a medicinal product (i.e. one with marketing authorisation) may lead to prosecution of those who are believed to possess products that do not have a marketing authorisation and/or might be counterfeit.

International Control

5.5 In the United States, Federal law placed anabolic steroids in Schedule III of the Controlled Substances Act (CSA) in February 1991. Subsequently the Anabolic Steroid Control Act of 2004 in the United States modified and updated the 1990 law.

5.6 "*The possession or sale of anabolic steroids without a valid prescription is illegal. Simple possession of illicitly obtained anabolic steroids carries a maximum penalty of one year in prison and a minimum $1,000 fine if this is an individual's first drug offence. The maximum penalty for trafficking is five years in prison and a fine of $250,000 if this is the individual's first felony drug offence. If this is the second felony drug offence, the maximum period of imprisonment and the maximum fine both double. While the above listed penalties are for federal offences, individual states have also implemented fines and penalties for illegal use of anabolic steroids".*[2]

[2] [2] USA Drug Enforcement Administration

6. Epidemiology

Growth of anabolic steroid use in UK

6.1 An orally active synthetic form of the male hormone testosterone, 17α-methyltestosterone, and injectable testosterone esters were developed in the 1930's. These rapidly found their way into research and clinical use for a variety of conditions including male hypogonadism. These drug products were followed by the introduction of novel anabolic steroids (both injectable and oral) from the 1950's onwards that usually exhibited, *inter alia*, an increased ratio of anabolic to androgenic activity (Kochakian, 1976). The clinical utility of these latter compounds were presumed to be in their reduced androgenic activity, and hence could be used more widely in women and children for conditions that would benefit from anabolic actions (such as cachexia and growth disorders). However, depending on type and dose, all anabolic steroids have the potential to induce masculinising effects in women and children thus limiting use. In the UK, testosterone, its esters and a small number of other types of anabolic steroids continue to be used clinically to treat a number of conditions including male hypogonadism (Nieschlag, 2006), delayed puberty, hereditary angioedema, metastatic breast cancer, and endometriosis (British Medical Association & Royal Pharmaceutical Society of Great Britain, 2008). In addition, clinical trials are being undertaken for use in HIV/AIDS-related wasting syndrome (Johns *et al.*, 2005), as well as a male contraceptive (Grimes *et al.*, 2007).

6.2 The potential of anabolic steroids to enhance both physique and sporting performance was quickly recognised. The use of anabolic steroids therefore grew among sportspersons and some of those attending health and fitness clubs. However, there are no reliable data on the early years of anabolic steroid use in relation to the UK.

"Determining when steroid use became commonplace within the general population of the United Kingdom is problematic, because, until 1992, reports were largely anecdotal or informal and limited in scope. It appears, however, that by the mid-1960's the use of steroids was an accepted practice in weightlifting and bodybuilding (including those at an amateur level). During the 1980's a number of reports began to appear about the use of these drugs in "health and fitness clubs", supplemented by a small informal survey in a gym in the West of Scotland along with a series of investigative reports in The Times newspaper that highlighted a "thriving" black market in "buying and selling of anabolic steroids … in British gymnasiums and health and fitness centres" (Evans-Brown & McVeigh, 2009).

Numbers of anabolic steroid users in UK

6.3 It is difficult to determine exactly how many people use anabolic steroids for non-medical reasons. Although these compounds are controlled under the Misuse of Drugs Act 1971 they have never rated a high enforcement priority among the many other illicit substances regulated in this way. The most comprehensive data for England and Wales are provided by the British Crime Survey (Hoare and Moon, 2010). The most recent data for 2009-2010 report estimates that in the 16-59 year old age group around 226,000 people reported to "ever" having used anabolic steroids, with 50,000 users in the past year, and 19,000 in the past month. Although these data appear to indicate an increase in anabolic steroid use since 2008/09 (when 179,000 admitted "ever use" and 17,000 in past year), there is no statistical difference in levels of use between years.

Table 1 summarises the data available for this age group from 1996 to 2009/2010.There was a statistically significant decline in reported anabolic steroid use for 'lifetime' use between 1996 and 2009/2010: from 1.1% of 16–59 year olds in 1996, to 0.7% in 2009/2010.

Table 1 – Data from British Crime Survey (BCS) on Anabolic Steroid Use among 16-59 year olds in England and Wales

	1996	**1998**	**2000**	**2002/ 2003**	**2004/ 2005**	**2006/ 2007**	**2008/ 2009**	**2009/ 2010**
% ever used	1.1	1.1	1.0	0.5	0.5		0.6	0.7
% last year	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2

6.4 It is important to note that the survey question on anabolic steroid use has changed over this period to include a qualifier. The question on lifetime use has been modified from "Have you ever taken anabolic steroids (steroids) even if it was a long time ago?" in 2000 to include the qualifier "Have you ever taken anabolic steroids (steroids) (not prescribed by a doctor) even if it was a long time ago?" In 2001/2002 (and onwards). Given the apparent confusion between anabolic steroids and corticosteroids — both commonly abbreviated to 'steroids' — within the general population it is reasonable to speculate that this decrease in reported use could actually be (either wholly or partly) due to an artefact caused by the change in question, whereby fewer false positives are being reported; particularly since this is the only drug question that changed during this time period.

6.5 The numbers of women reporting anabolic steroid use are relatively small, and there is a clear preponderance of male users, with a ratio of men to women reported ranging from 3:1 to as high as 10:1. The number of people reporting anabolic steroid use is relatively low by comparison with

some other illicit drugs but similar to rates reported for heroin or crack cocaine.

6.6 Among younger people (aged 16-24) reported by the BCS in 2009/2010, a total of 63,000 reported "ever" having used anabolic steroids; 27,000 used anabolic steroids in the last year; and 11,000 used anabolic steroids in the last month. Based on data from the 2007/2008 BCS; men again outnumbered women by a factor of as much as 10:1. A breakdown of the data for 16-59 year olds by age showed that peak reported anabolic steroid use occurred in the 25-29 year old sub-group (see Table 2).

Table 2. Data from British Crime Survey (BCS 2007/2008) of percentage Lifetime Anabolic Steroid Use in Different Age Groups.

16-19 yr	20-24 yr	25-29 yr	30-34 yr	35-44 yr	45-54 yr	55-59 yr
0.4	0.8	1.3	0.6	0.6	0.2	0.2

Table 3. Proportion and estimated number of adults aged 16 to 59 using anabolic steroids in the last year (BCS 2009/10).

Proportion and estimated number of adults aged 16 to 59 using anabolic steroids in the *last year*

Percentages and numbers						**2009/10 BCS**
	Proportion of adults reporting use of anabolic steroids in the *last year*		Number of adults reporting use of anabolic steroids in the *last year*		*Unweighted base*
	Estimate[1]	**Range[2]**	**Estimate[1]**	**Range[2]**	
	%	*%*			
16-59 year olds	**0.2**	**0.1 - 0.2**	**50,000**	**34,000 - 72,000**	***26,449***
16-24 year olds	0.4	0.2 - 0.7	27,000	14,000 - 50,000	*3,465*
25-34 year olds	0.2	0.0 - 0.3	13,000	6,000 - 27,000	*5,577*
35-44 year olds	0.1	0.0 - 0.2	7,000	3,000 - 17,000	*7,452*
45-59 year olds	0.0	0.0 - 0.1	3,000	1,000 - 12,000	*9,955*

1. Estimates are based on a small number of users and should be interpreted with caution.

2. The range is the margin of error around the estimate as these figures are based on data from a sample survey. As the sample gets smaller (i.e., for each age breakdown) the margin of error will increase.

6.7 Table 3 above shows the number of adults reporting use of anabolic steroids in the last year by age group (2009/10 BCS). The survey estimates that around 50,000 16-59 year olds used anabolic steroids in the last year; and around half of users (27,000) were in the age group 16-24 years.

6.8 Although the BCS provides the most comprehensive data on the prevalence of steroid use it has some limitations when considering steroid misuse. For example, being a household survey it does not include locations such as halls of residence, prisons or other sites of communal living; there is possible confusion in reporting between medicinal corticosteroids and illicit anabolic steroids (noted above); many steroid users belong to a closed sub culture who would be reluctant to divulge their use to outsiders; and steroid users are likely to be difficult to catch at home — most work, with some working evenings, and some can spend a high proportion of their time in the gym.

6.9 Despite the apparently reassuring data on general population use of steroids from the BCS, which indicate a decrease in steroid use in the past decade, there are some signs that this is not the full story. For example, in needle and syringe programmes in the North West of England the number of new steroid injectors attending these services in the period 1991 to 2008 has increased more than 10-fold and the total number of steroid users had increase more than twenty-fold (McVeigh *et al.*, 2003; Evans-Brown & McVeigh, 2009; Interagency Drug Misuse Database, 2009)

6.10 It is noteworthy that the "Frank" helpline recorded 250–350 calls in relation to anabolic steroids in the period 2003–2007/08. Further data on both the subject matter discussed in these calls as well as the demographics of the callers is not available.

Use of Anabolic Steroids by Schoolchildren

6.11 The BCS data does not report on drug use by children or adolescents under the age of 16, but data is available from English and Scottish surveys. The National Centre for Social Research have undertaken annual surveys of smoking, drinking and drug use among young people (school years 7–11) in England in a nationally representative sample of schools. Data on drug use are available from 2001 onwards. Among 11–15 year olds 0.5% reported "ever" having used anabolic steroids; 0.4% in the past year; and 0.2% in the past month (Fuller and Sanchez, 2010). The proportion of anabolic steroid users has remained relatively similar between 2001 and 2009, but with approximately twice as many boys reporting steroid use as girls. Among the 11–15 year olds surveyed 2% had been offered anabolic steroids at some stage (the same level each year since 2001).

6.12 In Scotland the Scottish Schools Adolescent Lifestyle and Substance Use Survey (Scottish Schools Adolescent Lifestyle and Substance Use Survey, 2006) has undertaken similar surveys of schoolchildren from 1998 onwards. In 2006 lifetime use reported by both 13 and 15 year old children was 1%, and 1% of those offered had reported use during the past year. Unusually, rates of use among girls and boys were approximately equal

(the reason for this is unknown). Steroid use remained low by comparison with other illicit drugs; 7% of 13 year olds and 26% of 15 year olds admitted having used cannabis, and 11% of 15 year olds had used stimulants.

6.13 The difficulty of obtaining accurate data on the prevalence of anabolic steroid use in young people is illustrated by the review conducted by Kanayama et al., (2007) who examined the results of four large national surveys on anabolic steroid use conducted in the USA among teenage girls. The results were remarkably disparate; one study reported a prevalence of only 0.1% whilst others reported figures as high as 7.3%. Closer examination of the reasons for such discrepancies suggested that the girls in the studies reporting high rates of use had confused anabolic steroids with corticosteroids and certain off-the-shelf dietary supplements.

Use of Anabolic Steroids to Enhance Sporting Performance

6.14 Sportspeople have used anabolic steroids to enhance their performance for the past fifty years or more. Such use has gained a high profile because of media interest, and persists internationally despite strict rules against it and increasingly rigorous random and intelligence-based drug testing programmes. The ACMD has not focused on this aspect of steroid misuse. In the run up to the 2012 Olympic Games in London a number of other groups have been reviewing this issue; these include UK Anti Doping, Department of Culture Media and Sport and the Association of Chief Police Officers (ACPO) study of "Drugs in Sport". Chapter 12 of the report does, however, note the UK policy response to this. It is hard to obtain any reliable estimates of the prevalence of use; even those at the highest level of international sport concede that they do not know the true prevalence (House of Commons Science and Technology Committee, 2007). Despite receiving much media attention, the use of anabolic steroids in elite sport accounts for only a fraction of the total number of steroid users in the general population (Kicman & Gower, 2003; Evans Brown & McVeigh, 2008).

Use of Anabolic Steroids for body building and image enhancement

6.15 Although national surveys indicate a relatively low rate of anabolic steroid misuse, this may not give an accurate picture of the higher rates of use prevalent among some sections of the community. There continues to be significant use of anabolic steroids for cosmetic purposes, not connected with any sporting endeavours (Baker *et al*., 2006; Bolding *et al.*, 2002; Lenehan *et al*., 1996; Williamson, 1991).

Much of this use is thought to be associated with health clubs and gyms, particularly those specialising in bodybuilding, although there is a lack of detailed research into the use of anabolic steroid and associated drugs within the more mainstream "Lifestyle" gyms. Gyms specialising in

bodybuilding were defined as ‘hardcore’ gyms by Lenehan *et al*., (1996) in their prevalence study of anabolic steroid use in gyms in the North West of England. The authors categorised gyms into three groups according to the equipment/facilities: hardcore, mixed, and fitness. In this study steroid use was reported by 29.5% of hardcore gym users (n=29 gyms), 16.0% of mixed gym users (n=10 gyms) and 1.5% of fitness gym users (n=4 gyms). Lifetime use was 50.7%, 31.9% and 15.1% respectively.

6.16 A survey of gym users in England, Wales and Scotland was commissioned by the Department of Health and published in 1993 (Korkia & Simpson, 1993). They surveyed 1667 participants in 21 gyms, and found that 6% of the men and 1.4% of the women were current users of anabolic steroids. Mishkind *et al.* (1986) have argued that the increasing use of anabolic steroids for cosmetic purposes is part of a trend of increased awareness of the ‘ideal male body, and changes in behaviour as men strive in growing numbers to achieve this mesomorphic muscular ideal’. This line of reasoning has received some empirical support from work predominately from North America and Australia that has examined the structural and personal factors which may shape this ideal, and for some individuals, the subsequent use of these drugs in order to attain this ideal (Grogan, 2008; Thompson & Cafri, 2007). However, there is limited data from the UK (see Grogan, 2008) and care must be taken when extrapolating these findings to the UK.

Use of Anabolic Steroids by Professional Groups

6.17 The ACMD heard anecdotal evidence that anabolic steroids were also used by some professional groups to enhance body size and strength. This applied particularly to those involved in direct physical contact with others as part of their job, including: police, security guards, and night and club door supervisors (“bouncers”). No data are available on the number of users in this category.

Patterns of Use

6.18 Anabolic steroids are generally used in patterns called “cycling”. Here the drugs are taken for a period of time (for example 6–12 weeks) known as an “on” cycle, followed by a similar period of steroid-free training known as an “off” cycle. Such a cyclical method is practiced in the belief that it prevents 'tolerance' to the steroids, reduce the risk of side effects from prolonged use, and allows the hypothalamic-pituitary-gonadal axis (which, among other things, controls endogenous testosterone production) time to resume normal function. Users also frequently combine several different types of anabolic steroids in a process known as “stacking”. Here, two or more anabolic steroids are taken at the same time, (using oral and injectable products for example). Users believe that stacking will have specific additional, or synergistic, effects, although this theory has not been scientifically evaluated.

7. Anabolic Steroids – Imports, exports and seizures

Imports and exports of anabolic steroids

7.1 The system for classifying goods for customs purposes is laid down by the UN Harmonized System and the EU Tariff Inter-Communautaire. This system does not allow for the recording of steroids in more detail than 'steroidal hormones' and only imports from and exports to countries outside the EU are required to make a customs declaration, therefore consignments coming from or going to other EU Member States cannot be counted. Therefore, import/export statistics extracted from Her Majesty's Revenue and Customs (HMRC) sources should be viewed with these constraints in mind.

Seizures of Anabolic Steroids – 2005, 2006/7 and 2007/8[3]

7.2 The UK National Drug Strategy directs law enforcement at those drugs that are deemed to cause the greatest harm, i.e. Class 'A', particularly heroin and cocaine. Nonetheless, the national strategy does recognise the concerns surrounding the abuse of anabolic steroids and both the police and UKBA do seize significant quantities of anabolic steroids.

7.3 The principal issue surrounding the decision whether to seize anabolic steroids or not is the lack of an easily determined limit above which there is an implicit intent to supply. Table 4 below shows total quantities seized, but individual seizures can range from accepted user quantities (being brought in on behalf of someone else and therefore liable to seizure) and substantial concealments in freight.

Table 4: Seizures of anabolic steroids by Police and UKBA[4]

	Police	HMRC/UKBA	Total
		2005	
Number of seizures	243	151	394
Quantity (doses)	853,000	2,481,000	3,334,000
		2006/7	
Number of seizures	433	89	522
Quantity (doses)	85,000	4,969,000	5,054,000
		2007/8	
Number of seizures	371	126	497
Quantity (doses)	78,000	6,907,000	6,985,000

7.4 Table 5 notes EU Member states control measures for anabolic steroids.

[3] We are not aware of any contemporary data in relation to safe disposal of used injecting equipment in this group

[4] For statistical purposes the quantities seized are expressed in doses, using a notional 6.17 doses to the gramme (this is based on 162mg being the 2005 average weight of a steroid tablet). (source: Home Office Research, Development and Statistics 2007).

Table 5. EU Member states control measures for anabolic steroids.

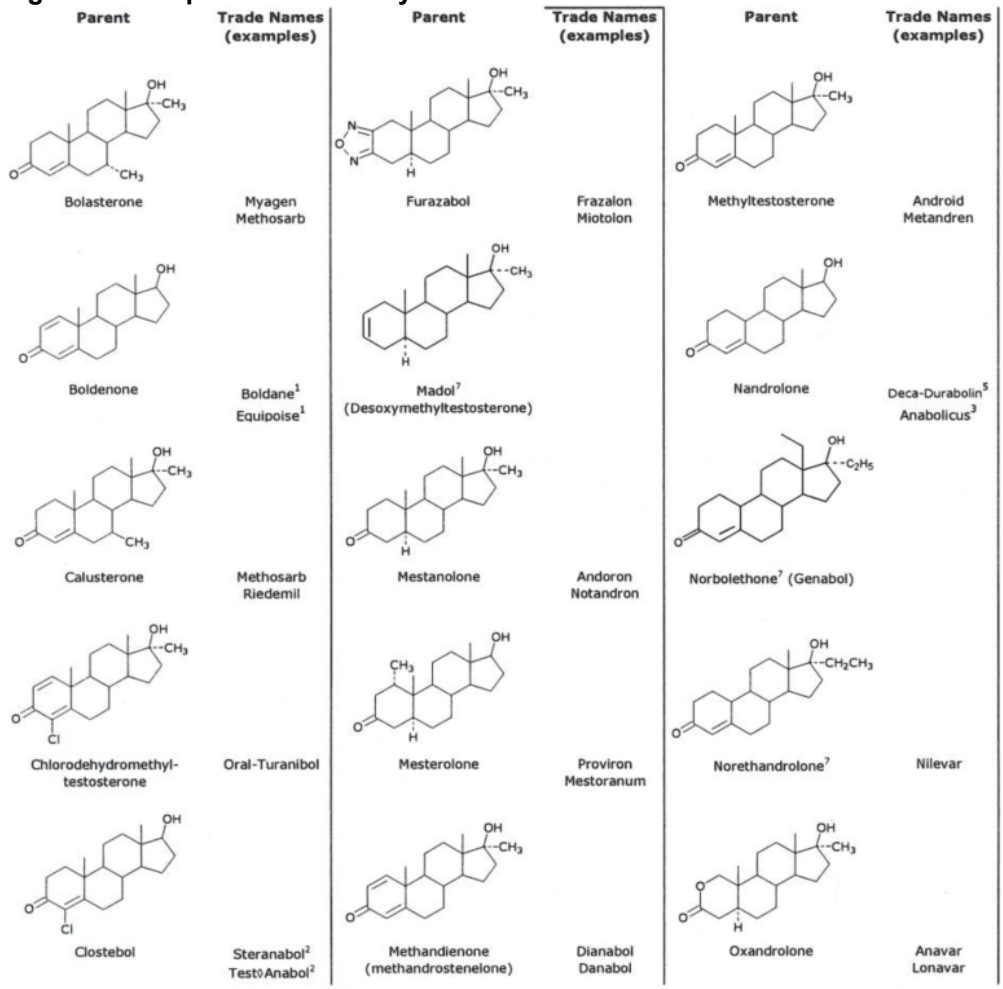
Legal for a person to:	Possess without prescription	Sell without govt. authorization	Traffic	Use without prescription	Comments
Austria	**Y**	**Y**	**Y**	**Y**	
Bulgaria	**N**	**N**	**N**	**N**	
Cyprus	**N**	**N**	**N**	**N**	
Czech Republic	**N**	**N**	**N**	**N**	
Denmark	**N**	**N**	**N**	**Y**	The offence in Denmark exists in possession not use.
Estonia	**Y**	**N**	**N**	**Y**	
Finland	**Y**	**N**	**N**	**Y**	
France	**N**	**N**	**N**	**N**	There are no concessions in France for personal use or self-administration. It is a criminal offence for competition athletes to use doping substances.
Germany	**Y/N**	**N**	**N**	**Y**	Germany has legally prescribed limits defined as 'not a small amount' which define the point beyond which it is illegal to possess. It is a criminal offence for competition athletes to use doping substances.
Greece	**Y**	**N**	**N**	**Y**	
Hungary	**Y**	**Y**	**N**	**Y**	
Ireland	**N**	**N**	**N**	**Y**	
Latvia	**N**	**N**	**N**	**N**	
Lithuania	**Y**	**Y**	**N**	**Y**	
Malta	**Y**	**N**	**N**	**Y/N**	The ban on use applies to competition athletes only.
Portugal	**Y/N**	**Y**	**Y**	**Y/N**	'Doping' legislation in Portugal is separate from controlled drugs legislation and only applies to competition athletes.
Slovak Republic	**Y**	**Y/N**	**Y**	**Y**	The ban on sale applies only to sales to under-18s and competition athletes.
Slovenia	**Y**	**N**	**N**	**Y**	
Sweden	**N**	**N**	**N**	**N**	
United Kingdom	**Y**	**N**	**N**	**Y**	

Note: The closest regime that any Member State has to that in the UK is Germany. However the German regime is based on a legally defined quantity of each drug that constitutes 'not a small amount'

8. Chemistry and Pharmaceutical Preparations

8.1 Anabolic steroids are androgens (from the Greek ‘andros’ meaning man and ‘gennan’ meaning to produce). The androgenic effects of androgens can be generally considered as those associated with masculinisation but there are also anabolic effects from these steroid hormones that are associated with protein building in skeletal muscle and bone. In men, androgens are essential for sustaining reproductive function and they play an important role in maintaining skeletal muscle and bone, sex-typical cognitive function and a sense of well-being (Christiansen, 2004; Mooradian *et al*., 1987). Testosterone is the most important naturally produced androgen, which also has considerable anabolic properties. Secretion of testosterone by the healthily functioning testes contributes to approximately 95% of the testosterone circulating in the bloodstream (Luke *et al*., 1994; O’Malley *et al*., 1999). In women, the rate of production of testosterone is about a tenth to twentieth less of that in men (0.1 to 0.4 mg per day compared to approximately 3 to 9mg per day in men).

Figure 1 Examples of commonly used anabolic steroids



8.2 Chemical syntheses of analogues of testosterone, related in structure, were undertaken by drug companies in an attempt to design steroids with enhanced anabolic effects compared to the androgenic effects. In this way, it was hoped that the anabolic effects could be harnessed for medicinal purposes whilst avoiding the undesirable androgenic effects that could cause masculinisation in women and children. Complete dissociation (separation) of anabolic from the androgenic effects was never achieved, however, and all the anabolic steroids developed have androgenic properties to varying degrees. Even so, anabolic-androgenic dissociation was considered to be sufficient to warrant many anabolic steroids being licensed as medicinal products in the 1960s and 1970s.

8.3 The efficacy of anabolic steroids in treating patients with considerable tissue (protein) breakdown has not proved convincing. By the end of the 1980s, most anabolic steroids had been withdrawn as licensed products in several countries, including the UK, although many anabolic steroids are still supplied legitimately in other countries. Anabolic steroids are now predominantly limited for the purposes of hormone replacement therapy in the testosterone-deficient male (hypogonadism), these being various formulations of testosterone and its esters, and some xenobiotic (foreign to the body) steroids for the treatment of specific diseases.

8.4 Steroids are sufficiently small to diffuse from the blood stream into cells, where they dock into receptors, which are much larger specialised molecules. There are different receptors for each class of steroids in target tissues, that is, there are specific receptors for androgens, oestrogens (female sex hormones), glucocorticoids (helping to regulate blood glucose levels and also the body's overall response to stress) and mineralocorticoids (regulate salt balance). Androgen receptors are present in cells in reproductive tissues, skeletal and heart muscle, bone, hair follicles in the skin, liver, kidney and brain.

8.5 Anabolic steroids activate their receptors through complex molecular mechanisms (see Appendix D) to cause changes associated with androgenisation and effects on muscle. Usually the body has a natural balance between growth (anabolism) and breakdown (catabolism) of cells. However, if testosterone is administered chronically in doses sufficient to considerably raise testosterone in the blood circulation, this causes a swing towards anabolism. For example, there will be growth of skeletal muscle and an increase in strength and power, which can also be enhanced by taking exercise (Bhasin *et al*., 1996; Bhasin *et al*., 2001; Woodhouse *et al*., 2003). Other androgenic effects also are augmented by exercise.

8.6 The mechanisms underlying the enhanced anabolic versus androgenic effects of some synthetic steroids remain incompletely understood, but are

discussed in more detail in Annex C.

8.7 Androgen receptors mediate the effects of anabolic steroids in the mammalian brain. Anabolic steroid administration is sometimes associated with increased aggression, especially in high-dose users, but increased aggression is not a foregone certainty given that the interaction between androgens and behaviour in men and women is complex. It is an entirely reasonable hypothesis that the athlete and bodybuilder may learn to recognise and harness the increase in aggression that may arise with steroid use to help drive their training and increase their competitiveness. Of note, is that the few research studies (randomised and placebo-controlled) to investigate the effects of anabolic steroids on mood and behaviour have generally failed to demonstrate aggressive behaviour, but such studies cannot replicate, for ethical reasons, the high steroid intake, and mixtures of drugs, used by some gym-users, which have been associated with violent behaviour or ‘roid rage’ (as it is referred to by users) (James *et al.*, 2004)

9. Harmful effects of anabolic steroids

Background

9.1 Methodological, ethical and logistical constraints preclude the use of 'gold standard' randomised controlled trials that administer the high-dose polydrug regimens that are common within this community. As a result, much of the data on the harmful effects are derived from case reports/series and cross-sectional study designs that are observational in nature. While clinical case reports and series have associated a number of adverse events with the self-directed use of anabolic steroids (i.e. that 'there is a reasonable probability that the event may have been caused by the drug[s] (Alghabban, 2004)), more research is required to determine if the reported associations from studies in this field are independent, artifactual (e.g. due to chance or bias), confounded or causal (Alghabban, 2004). Moreover, many of the studies undertaken in this field to-date have serious methodological limitations leading to problems with internal validity and generalisability (Evans-Brown *et al*., 2009). This includes an over-reliance on the use of self-reported (subjective) measures many of which have not been validated. (For further details see Annex E.)

Harmful Effects of Anabolic Steroids

9.2 Some of these harmful physical effects (see 9.9) are commonly self-reported, e.g. acne, endocrine effects, gynaecomastia in males – but others are rarer and therefore the causal link to anabolic steroid use is equivocal.

9.3 Most of the harmful effects of anabolic steroids are not life-threatening, although a small number of deaths have been attributed to liver damage associated with long term steroid use. Many, but not all, of the adverse effects are reversible on cessation of steroid use. However, there are special concerns about the use of anabolic steroids by young people as the use of these substances can lead to virilization (see 9.4 for effects on females) and, more broadly, potentially disrupt the normal pattern of growth and behavioural maturation.

9.4 Adult female steroid users are also exposed to risks such as virilization. These can include marked physical effects such as hirsutism, deepening of the voice, amenorrhoea/anovulation, clitoral enlargement, atrophy of breast tissue, and changes in libido. These effects can be pronounced, and, in some cases, permanent.

9.5 Although there is not enough evidence to connect chronic anabolic steroid use with substance dependence, the positive psychological effects experienced by many users appears to reinforce the continuing use of steroids for some users.

9. 6 The majority of users inject anabolic steroids (see Annex E). As a consequence, they are potentially at risk of a number of serious harms that include. However there are limited data on injecting practices in this group. Harms include: 1. damage to the injection site as a result of poor injecting technique; 2. bacterial and fungal infections (such as localised abscesses and systemic infections) as a result of poor injecting technique, contaminated drug products, and sharing vials and/or reusing injecting equipment; and, 3. Blood-borne viruses (BBV) such as HIV, Hepatitis B and hepatitis C as a result of sharing used injecting equipment or sharing vials (that have become contaminated through reuse of injecting equipment) with others.

9.7 We are not aware of any contemporary data in relation to safe disposal of used injecting equipment in this group. Burton (1996) in a study from North Wales found that out of ~55 users, 18 passed used equipment to a NSP, 24 passed the equipment to someone else, 26 put them in the 'dustbin', 3 left them lying around and 4 put them down the drain. Up-to-date research is required in this user group. There are limited data on these risks in this user group (see Annex E)".

9.8 In terms of CNS effects, steroid use has been associated with a range of psychological and behavioural effects (such as hypomania, mania, aggression, violence, depression, and, after ceasing use, suicide) in case reports. Although there is not enough evidence to connect chronic anabolic steroid use with substance dependence, the positive effects experienced by many users (including: increased training capacity; strength; enhanced appearance; and, feelings of well being) appear to reinforce the continuing use of steroids in some individuals. .

Adverse effects reported to be associated with anabolic steroid use (For a more detailed review see Annex E)

9.9 **Acne**

Self-reported acne is a common finding in questionnaire-based studies. The measures used have not been validated. There have been some case reports that documented severe forms of acne such as acne conglobata or acne fulminans in users.

9.10 **Androgenic alopecia (male pattern baldness)**

Some users self-report loss of scalp hair in questionnaire-based studies. Self-reported increased growth of body hair when using steroids is a more common finding. The measures used have not been validated.

9.11 **Gynaecomastia**

Gynaecomastia is the growth of the glandular breast tissue in males thought to be caused by an imbalance in the ratio of free oestrogen to testosterone. In users this could be mediated through the increased

peripheral aromatization of aromatizable exogenous steroids to oestrogenic metabolites and/or alterations in the transport/binding of endogenous oestrogens and testosterone. Many of the drugs commonly used by this group (such as growth hormone, human chorionic gonadotrophin, spironolactone) have also been clinically associated with gynaecomastia.

9.12 **Genitourinary**

Many anabolic steroids when used at sufficient dose can suppress endogenous testosterone production and spermatogenesis leading to transient testicular atrophy and infertility. Data from clinical trials using testosterone esters as a male contraceptive, along with case series of users, suggest that for some individuals it can take a varying number of months for endogenous testosterone production and fertility to recover when the drugs are withdrawn. While it is common for users to self-report increased libido during an “on” cycle (and to a lesser extent decreased libido during an “off” cycle (which in some users could be due to suppression of endogenous testosterone production)), these effects have not been sufficiently researched. Some users also self-report erectile dysfunction both during “on” cycles and “off” cycles. Again these reported effects require further research. There has been a case report of prostatic cancer in an individual who was a long-term steroid user and a small number of case reports of renal cancers in individuals who reported use of anabolic steroids.

9.13 **Liver**

The use of some types of anabolic steroids, in particular the 17α-alkylated compounds, has been associated with hepatic dysfunction and disease in clinical populations. In anabolic steroid users there have been some case reports of acute liver injury that are associated with the use of oral 17α-alkylated steroids; while cross-sectional data appears to demonstrate that liver function can be impaired in some users. However, the extent of this has been questioned by Dickerman *et al*., (1999) who found that many studies failed to use specific markers of liver function and hence failed to distinguish between markers of hepatotoxicity and markers of muscle damage secondary to high-levels of resistance exercise. Some prospective studies have reported no changes in markers of liver function. Differences in the study design, participants and drug regimens could account for these different findings. There have been a small number of case reports of benign liver tumours, peliosis hepatis (blood-filled sacs in the liver) and hepatocellular carcinoma reported in the literature in individuals who have reported anabolic steroid use.

9.14 **Cardiovascular**

The use of anabolic steroids has been associated with a range of both acute and chronic cardiovascular pathologies. Much of this data is

equivocal (see Annex E). Differences in the study design, participants and drug regimens could account for these different findings.

9.15 **Musculoskeletal**

There have been a small number of case reports where damage to tendons/ligaments have occurred after steroid use. It is thought that this could be as a result of disproportionate growth of the muscle compared to the tendons/ligaments. There have also been some case reports of rhabdomyolysis (breakdown of striated muscle cells).

9.16 **Psychological & Behavioural**

While steroid use has been associated with a range of psychological and behavioural effects (such as hypomania, mania, aggression, violence, depression, and, after ceasing use, suicide) in case reports and some studies these effects have not been sufficiently researched. Although there is not enough evidence to connect chronic anabolic steroid use with substance dependence, the positive effects experienced by many users (including: increased training capacity; strength; enhanced appearance; and, feelings of well being) appear to reinforce the continuing use of steroids in some individuals. It is thought that this can be a particularly strong force during an “off” cycle or when ceasing use because endogenous testosterone production maybe suppressed, leading to low circulating levels. Further research is required to examine these issues.

9.17 **Specific concerns for young people**

The use of anabolic steroids can lead to virilization and, more broadly, potentially disrupt the normal pattern of growth and behavioural maturation. Aside from limited studies examining prevalence, little data are available on the use of these drugs by young people.

9.18 **Specific concerns for females**

Given the low endogenous levels of testosterone in females, any increase (whether through disease or exogenous sources) can lead to virilisation which includes: hirsutism, deepening of the voice, amenorrhoea/anovulation, clitoral enlargement, atrophy of breast tissue, and changes in libido. The impact of these effects can be pronounced, and, in some cases, permanent. Little data are available on the use of these drugs by this group.

Data from animal studies

9.19 Studies characterising the actions of many anabolic steroids (including compounds that were never commercialised) using *in vivo* animal studies have been extensively reviewed by Krüskemper (1968), Kochakian (1976) and Vida (1969). More recently, animal toxicity studies have aimed to examine the possible modes of action of anabolic steroids by attempting to confirm reported adverse effects in humans. This has included the study of

both (serious) physical and behavioural adverse events; such as adverse cardiovascular events (Fanton, 2009; Medei *et al*., 2010), increased aggression (Harrison *et al*., 2000; Melloni *et al*., 1997) and development of dependence (Wood, 2008). Overall these data suggest that, of those anabolic steroids tested, high doses could induce such adverse effects.

Nevertheless, there is still a need for a systematic evaluation of data from animal toxicity studies with a view to its relevance to humans, particularly as there are complex species differences with regards to drug metabolism and toxicity.

10. Substandard and counterfeit anabolic steroids on the illicit market[5]

Background

10.1 Counterfeit anabolic steroids are recognised as an issue by the user community (Duchaine, 1989; Korkia & Stimson, 1993; Llewellyn, 2009; McVeigh & Lenehan 1995). Counterfeit medicinal (drug) products are those that are "…deliberately and fraudulently mislabelled with respect to identity and/or source. Counterfeiting can apply to both branded and generic products and counterfeit products may include products with the correct ingredients or with the wrong ingredients, without active ingredients, with insufficient (inadequate quantities of) active ingredient(s) or with fake packaging" (World Health Organization). However, this situation is complicated by the presence on the illicit market of (purportedly) legitimate anabolic steroids that are substandard - i.e. "… genuine medicines …which do not meet quality specifications set for them by [inter]national standards" (World Health Organization, n.d.b.). Both substandard and counterfeit anabolic steroids are not based on sufficient quality management that is required for medicinal products for use in humans (Medicines and Healthcare Products Regulatory Authority, 2007; World Health Organization, 2007).

10.2 Limited contemporary data from Australia, Germany, the UK and the US suggests that the majority of users obtain their anabolic steroids from the illicit market (e.g. Baker *et al*., 2006; Cohen *et al*., 2007; Larance *et al*., 2005; Parkinson & Evans, 2006; Striegel *et al*., 2006). While some users do obtain drug products through prescription (Cohen *et al*., 2007; Larance *et al*., 2005; Parkinson & Evans, 2006; Striegel *et al*., 2006) (although little data are available on the proportion of these that would be considered clinically appropriate based on current guidelines), or over-the-counter (see below), the illicit market is the sole source of some drug products that are in high demand by users. Indeed, in the UK many anabolic steroids used in 'stacking' (Evans-Brown & McVeigh, 2009) are either not available as licensed products or may only be licensed as part of veterinary medicinal products.

Drug products on the illicit market

10.3 While there is a paucity of data on the structure of the illicit market, data suggest it is comprised from three sources of products:

- Products purportedly manufactured legitimately (typically) in middle-income countries (such as China, India, Pakistan and some former Eastern Bloc countries) where drug regulatory oversight and enforcement is weak (World Health Organization, 1999; World Health Organization,

[5] Part of this chapter has been reproduced from a publication (Evans-Brown et al., 2009a).

2004). Products manufactured and/or packaged in clandestine 'underground' laboratories of varying capacity and quality (Drug Enforcement Agency, 2007; Llewellyn, 2007) which, because they exist outside of the drug regulatory system, the products cannot demonstrate sufficient 'quality, safety and efficacy' (Medicine and Healthcare products Regulatory Authority, 2007: 4–5).[6]

- Legitimate products manufactured in high-income countries that are: purchased over-the-counter (including internet sales) in countries where this practice is lawful or where regulatory oversight and enforcement is weak (World Health Organization, 1999; World Health Organization, 2004); diverted to the illicit market through theft (Bøgeskov, 1998; Cameron, 2000; Johansen, 2008); unlawfully resold (e.g. United States Attorney's Office Southern District of Florida, 2009); or prescribed/dispensed as a result of fraud (e.g. Drugs and Poisons Regulation Group, n.d.; Striegel *et al*., 2006).

10.4 The proportion each source contributes to the market as a whole is not known. Moreover, it is reasonable to assume that the contributions of each source are likely to be dynamic both temporally and spatially as a result of, *inter alia*: different policies pursued between (and within) nation-states towards restricting the supply, demand and use of these drugs, which will, subsequently, result in varying degrees of action by law enforcement and drug regulatory authorities; the demand for specific drug products by the user community; and, wider economic and social policies, including globalisation (Petryna & Kleinman; 2006; World Health Organization, 2002) and increasing use of the Internet (World Health Organization, 2002).

Prevalence of substandard and counterfeit anabolic steroids and their composition

10.5 A limited number of studies have examined the composition of anabolic steroids obtained from the illicit market. Using convenient samples this work has focussed on identification of the active pharmaceutical ingredient(s) (API) (Walters, 1990; Perry, 1995; Musshoff, 1997; Thevis, 2008; Graham *et al*., 2009), and, more rarely, also quantifying the strength of the API (Walters, 1990; Perry 1995). Common findings included: the substitution of the API(s) from that stated on the labelling/packaging or the inclusion of undeclared APIs (Graham *et al*., 2009; Perry, 1995; Musshoff

[6] It is important to note that some of these labs appear to manufacture products that include counterfeit versions of legitimate, licensed, drug products, as well as their own 'generic' and 'proprietary' products that do not necessarily appear to fit within the World Health Organization's definition of a counterfeit drug (World Health Organization, 1999). Smaller scale labs appear to buy bulk active pharmaceutical ingredients from manufacturers in countries such as China and manufacture the finished drug products themselves.

et al., 1997; Thevis *et al*., 2008); no detectable APIs as per those stated on the labelling/packaging and as per the analyses undertaken (Perry, 1995; Graham, 2009); and, APIs that are under-strength (Walters, 1990; Perry, 1995) and over-strength (Walters, 1990; Perry, 1995)[7]. Moreover, data from Perry (1995) found large variation between the composition (including the strength of APIs) of some products purported to be from the same manufacturer, suggesting that visual identification/inspection cannot be relied on. Importantly, the published data available on the strength of the APIs of these drug products is now more than fourteen years old.

10.6 All these studies used convenience samples and did not adequately describe the sampling frame making it difficult to determine how these results are representative of the wider market. However, they are broadly supported by information from genre publications and the user community (Evans-Brown *et al.*, 2009a). There has not been a systematic examination of both the prevalence of substandard and counterfeit anabolic steroids and their composition

Implications for health

10.7 Substandard and counterfeit anabolic steroids could affect health in a number of ways, including;

i. Anabolic steroids that are contaminated either biologically, chemically or with foreign matter pose a risk to health. This is relevant given that many dosage forms are injectable and used in high volume often over long periods of time (Medicines and Healthcare Products Regulatory Authority, 2007).

ii. While at first glance under strength APIs may not appear to be a problem, anecdotally this is believed to have led some users to compensate by using much larger 'doses'. However, given the potential variability in the composition from different products (one may be over-strength, the next may be under-strength — there is no way of knowing with products derived from the illicit market), the next time the user may get a product that is over-strength leading to an even higher dose being inadvertently used.

iii. The substitution of the API(s) from that stated on the

[7] We are also aware of two case reports. Bergman et al., (1993) reported that a vial of 'Depo-Testosterone' (obtained from a user who presented with a gluteal abscess) that was contaminated with Pseudomonas organisms (although it is unclear how and when the bacterial contamination occurred) and which upon analysis was found to contain "less than 2 mg of testosterone per mL when it should have contained 200 mg"; and, van der Kuy et al., (1997) who reported the adulteration of an anabolic steroid purporting to be 'Thai Dianabol' (methandrostenelone) where this API had been substituted for methyltestosterone and the β_2 agonist clenbuterol, the latter being at high strength. Although the methodology of the analyses undertaken in these two case reports were not adequately described.

labelling/packaging or the inclusion of undeclared APIs means that users cannot be assured of the particular API that they are using. This is problematic given that individuals seeking low-androgenic preparations (particularly women aiming to prevent/limit virilization (Korkia *et al*., 1996)) may unintentionally use a more androgenic API (Thevis *et al*., 2008).

Implications for research

10.8 Much of the data on the adverse events associated with anabolic steroids use (Alghabban, 2004) are derived from case reports/series and cross-sectional study designs that are observational in nature. Observational approaches are likely to remain the main type of research design for some time. This is, at least in part, due to the methodological, ethical and logistical constraints preclude the use of randomised controlled trials. Particular attention should therefore be paid to variables that could affect the validity of any such work before it is undertaken (Jenicek, 1999; Rothman *et al*., 2008; Vandenbroucke *et al*., 2007).

10.9 Data from studies have demonstrated some discordance between self-reported use of anabolic steroids and that detected through urinalysis (Ferenchick, 1996; Sader *et al*., 2001). Whether this discrepancy is unintentional (Geyer et al., 2008) or intentional on behalf of the patients/participants is unclear. However, it is apparent that self-reported drug use cannot be relied upon (Fendrich *et al*., 1999; Kidwell *et al*., 1997; Thevis *et al*., 2008). Moreover, the relatively small number of studies that have performed drug identification have not systematically performed drug quantification nor examined the composition (including strength of APIs) of the drug products being used by the patients/participants. While difficulties in this process are evident, it is likely that these methodological limitations have weakened the validity and of much of this work.

10.10 The issue of substandard and counterfeit anabolic steroids is likely to increase for the foreseeable future if the popularity of these drugs rise, coupled to their ease of availability through transnational internet sites (purportedly) trading in these products (World Health Organization, 2002). Illustrative searches using the term ‘buy anabolic steroids’ (Anonymous, n.d.a.) provide an indication of the prevalence and global nature of such sites; with data from relatively large Internet-based studies (n=1,955 (Cohen *et al*., 2007) and n=500 (Parkinson & Evans, 2006)) in the United States reporting that between 52.7%–79.4% of participants had purchased anabolic steroids over the Internet (although it is unclear how representative these groups are).

10.11 The issue of drug testing and analysis in research studies has become more salient given the large number of ‘dietary supplements’ as well as ‘lifestyle/well-being’ drugs available on the legitimate and illicit markets.

This is not only because of the association of adverse events following the use of some of these products (see Evans-Brown *et al*., 2009a), but also that some products have been contaminated with APIs such as anabolic steroids, centrally acting appetite suppressants, diuretics, and drugs for erectile dysfunction. Moreover, some of these APIs were found to be present at high strength (see Evans-Brown *et al*., 2009a).

10.12 This, along with the use of off-the-shelf 'designer steroid' supplements (Kazlauskas, 2010) — that are marketed as safe(r) and legal alternatives to 'classical' anabolic steroids — could confound the data if research studies do not systematically quantify the use and composition (including any contamination) of these products in both users and 'control groups' (Evans-Brown *et al*., 2009a).

11. Harm reduction

Background

11.1 Harm reduction can be defined as policies, programmes, services and actions that work to reduce the health, social, and economic harms to individuals, communities, and society that are associated with the use of drugs (Newcombe, 1992).

11.2 Research into preventing, delaying the onset and reducing existing use of anabolic steroids is limited. Knowledge-only programmes conducted with high-school varsity football players in the United States found that despite increasing knowledge of anabolic steroids, these programmes did not alter intention to use or actual use; moreover, the authors argue that the use of 'scare' tactics resulted in a trend towards a more positive attitude towards use (Goldberg *et al*., 1990; Goldberg *et al*., 1991). A randomised prospective trial also in the United States focussed on preventing anabolic steroid use in adolescent males involved in high school football (Goldberg *et al*., 1996a; Goldberg *et al*., 1996b; Goldberg *et al*., 2000) by providing education on steroid use along with training in exercise, nutrition and communication skills. However, it failed to demonstrate a significant difference in the number of individuals taking up anabolic steroid use compared with the control group.

11.3 There is no recognised drug treatment provision for anabolic steroid users in the UK (National Treatment Agency for Substance Misuse, 2006) and is not addressed within the UK Clinical Guidelines for the Management of Drug Misuse and Dependence (Department of Health, 2007). Furthermore, the use of anabolic steroids is not within the remit of the National Treatment Agency for Substance Misuse (National Treatment Agency for Substance Misuse, 2006). In the absence of prevention and treatment programmes, harm reduction programmes have become the mainstay of health interventions.

Do steroid users want harm reduction programmes?

11.4 Although there are limited data, it appears that there are a significant number of users who would welcome appropriate engagement with health services (Bolding *et al*., 1999; Dawson, 2001; Korkia & Stimson, 1993; Lenehan *et al*., 1996; McVeigh & Lenehan, 1995; Pates & Barry, 1996; Personal communication from steroid users to ME-B, 2008). Whilst the potential barriers to meaningful engagement with this population have been recognised by those involved in the provision of National Syringe Programmes (NSPs), effective communication has also been identified as being critical in the development of appropriate interventions (Sumnall et al., 2008).

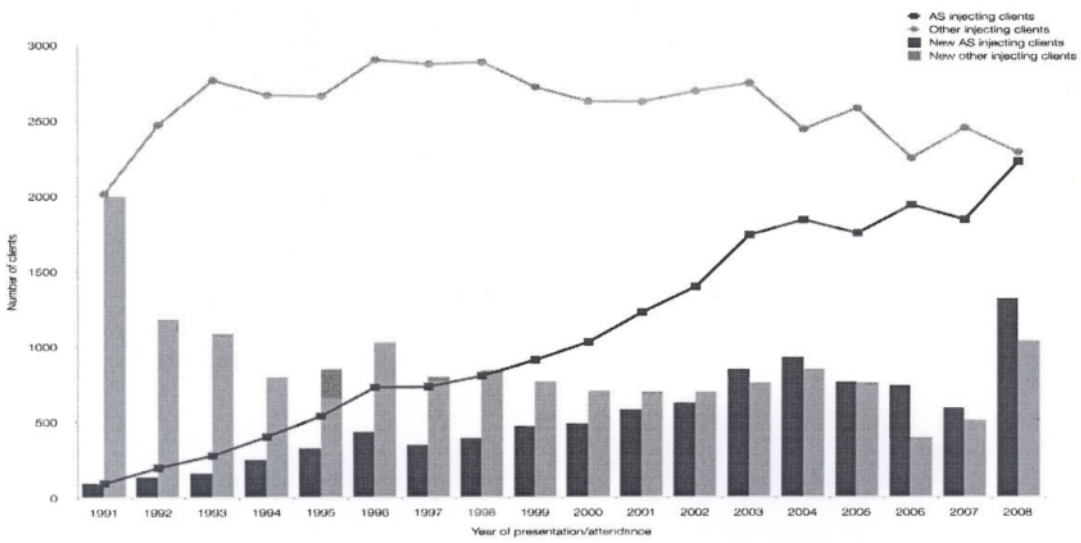
11.5 NSPs have typically focussed on intravenous injectors, initially those using

opiates and more recently those engaged in polydrug use. However, it appears that they have been increasingly accessed by those injecting anabolic steroids (Korkia & Stimson, 1993; McVeigh *et al*., 2003). Indeed, data from Korkia & Stimson (1993) found that 56% (49/88) of those injecting anabolic steroids reported using NSPs as their main source or injecting equipment. Korkia & Stimson (1993) also found that 88.8% (79/88) of injectors did not experience problems obtaining sterile injecting equipment, and 92% (81/88) would use a NSP if it were available to them.

11.6 A study of users in gyms in the North West (Lenehan *et al*., 1996) found that the three main sources of injecting equipment were, in descending order of frequency: gym owner/manager; NSPs and friends. The study also found that 96.9% of the injectors did not experience problems obtaining sterile injecting equipment and 91.7% would (or already had) attend(ed) a free NSP for steroid users.

11.7 There is a lack of contemporary data on the sources of injecting equipment for steroid users. Data from Merseyside and Chester (McVeigh, 2003; Evans-Brown & McVeigh, 2009; Interagency Drug Misuse Database, 2009) (one of the few areas of the country to have systematically recorded injecting equipment transactions since the early 1990s) have found more than a ten-fold increase in the number of new injectors attending NSPs between 1991–2008 and more than a twenty-fold increase in the total number of steroid injectors attending these services during this time (see section on prevalence). These data provide an indication of the importance of NSP in providing injecting equipment to steroid users. Moreover, it has been suggested that extensive peer-distribution networks exist that provide injecting equipment to other users (McVeigh *et al*., 2007; Heron, 2008).

Figure 2 Number of steroid users presenting at Merseyside and Cheshire Needle and Syringe Programmes



11.8 In a recent report by the National Treatment Agency for Substance Misuse, they note that "some [local drug partnerships] had seen an exponential rise in steroid use in recent years, with steroid users responsible for more than half of needle exchange activity in some services. A number of areas had developed, or were in the process of developing, services for steroid users. These included needle exchanges or mobile needle exchanges in local gyms, outreach and satellite services in gyms, specialist clinics at the local harm reduction service and the provision of advice and information to steroid users" (National Treatment Agency for Substance Misuse, 2006).

Settings for interventions

11.9 In order to prevent the transmission of blood borne viruses, the ACMD in their 1993 report recognised that drug users should have access to sterile injecting equipment (Advisory Council on the Misuse of Drugs, 1993, 3):

> *"but move beyond the concept of drawing drug users into services to develop a broader response, which, above all, incorporates a range of early interventions".*

One particular approach advocated is the use of outreach that "targets … those who do not seek (or else do not have easy access to) existing services, working with them in their own communities and local settings" (Advisory Council on the Misuse of Drugs, 1993).

11.10 Harm reduction programmes aimed at engaging steroid users could be delivered in primary and secondary care settings that include: outreach services in gyms (inc. mobile NSPs/clinics); needle and syringe programmes; pharmacies; GP practice; and secondary care services: such as acute (emergency) care services. Indeed, the recently published National Institute for Health and Clinical Excellence (NICE) public health guidance on NSPs recommends the commissioning of research to address how NSP can more effectively engage with anabolic steroid users. This specifically included the evaluation of gym-based interventions (National Institute for Health and Clinical Excellence, 2009).

Harm reduction resources

11.11 There are some educational materials, most notably in the form of leaflets and booklets, that provide information aimed at educating users and reducing harm (this includes information on safer injecting) (Camden Primary Care Trust, 2004; HIT, (no .date .available); HIT n.d.b; HIT n.d.c; Lifeline, n.d.a; Lifeline, n.d.b; Lifeline, n.d.c; Lifeline n.d.d; Lifeline n.d.e). Further, there are also some web-based resources for both users and drug workers/health professionals (Centre for Public Health, n.d.). However, these compete against information and discussions provided on high-profile sites run by those influential in the steroid-using community (who may also have financial conflicts of interest).

Case studies

11.12 In response to local need, a small number of specialist services have been developed in the UK. These include the Drugs In Sport Clinic and Users' Support (DISCUS) in Tyne & Wear and the Smart Muscle service in Soho, London (not currently operating). Furthermore, peer programmes for the provision of sterile injecting equipment have also been developed in some areas. These are similar to the Steroid Peer Education Project (SPEP) run in Victoria, Australia (Delalande *et al*., 1998; Campbell & Cheryl, 2002), where steroid-using peers are involved in the provision of harm reduction services. The involvement of peers is viewed as essential to gaining wide engagement from this user group[8].

Harm reduction interventions

11.13 While the evidence base for harm reduction within this specific group of drug users is scant, general principles of harm reduction from the wider drug using population have been adapted for anabolic steroid users and are implemented in a number of services (in particular NSPs) across the United Kingdom. Based on the limited number of peer reviewed publications regarding health interventions for anabolic steroid users (Dawson, 2001; Millar, 1994), some basic tenets of harm reduction provision have developed. In particular, the prevention of blood borne virus transmission (together with a range of other untoward effects of injecting) remains a priority. As is the case for most aspects of NSP provision in the United Kingdom, these interventions have not been evaluated and as highlighted by The Public Health Interventions Advisory Committee evidence is particularly lacking in relation to this group of injectors: "There is a lack of UK-based research on the effectiveness and cost-effectiveness of NSP services in the UK in relation to different groups of injecting drug users. There is a particular lack of information on people who inject performance- and image-enhancing drugs." (National Institute for Health and Clinical Excellence, 2009).

Vulnerable groups: Young people and women

11.14 There are a lack of data on young people and women in relation to accessing harm reduction programmes. Research is required to explore the health needs of these user groups and how these may be best met. A significant number of users are young males (18–25) (Lenehan *et al*., 1996) who may not perceive themselves as vulnerable (nor may they be seen as vulnerable by wider society). Indeed, anecdotal information suggests that some younger users may be reluctant to attend NSPs out of

[8] While there are a number of services across the United Kingdom offering services to anabolic steroid users, we cite four examples of established services, summarised from the conference: Performance and Image Enhancing drugs in the 21st Century held in Liverpool on 5th October 2007, and the reader is directed to Annex F of this report for further details of these. Each provides a different approach. The omission of other services that are currently available is in no way a reflection of the quality of the interventions they provide.

concern of being labelled as an injecting drug user (personal communication from steroid users to ME-B, 2008). While the available data have demonstrated that the number of women using anabolic steroids is small (see section on prevalence; chapter 6), it is imperative that those using these drugs have access to services — not only access to NSP but also wider health services given the potentially permanent virilizing effects of these drugs in this group (see section on harms). While research is lacking in this area, there could be gender-specific barriers that may impede the ability of women users to engage with services: in addition to the potential for embarrassment among some users due to the virilization of their bodies, users may also feel stigmatised as a result of the self-administration of what is regarded as a male sex hormone. Further, services may not be set up to provide the specific services that women users require.

High-dose polydrug regimens

11.15 Anabolic steroids are rarely used in isolation but are typically used along with a number of ancillary drug including clenbuterol, human growth hormone, human chorionic gonadotropin, and insulin (Baker *et al*., 2006; Evans-Brown & McVeigh, 2009 Lenehan *et al*., 1996) etc. Moreover, there is some evidence to suggest that there may be a high prevalence of use of cocaine among some groups of anabolic steroid users (McVeigh *et al*., 2007). While we are aware that some harm reduction services do reflect this polydrug use in the services they provide, overall there is limited data on the type of services offered and coverage.

Early identification of problems

11.16 Data from studies conducted prior to the control of anabolic steroids under the Misuse of Drugs Act 1971 found that 32.7% (n=36/110) and 43% n=~165/384) of current users had informed their general practitioner GP) of their use of these drugs (Korkia & Stimson 1993; Lenehan *et al*., 1996). However, we are not aware of any contemporary data on this issue. It is not known what effect the change in, *inter alia*, legislation nor the increasing use of the Internet to access information has had on health seeking behaviours of this group despite simple possession not being an offence, anecdotal information suggests that some users believe that it is an offence which may deter them seeking help. Furthermore, there are limited data on the number of services available to users in the UK that would allow them to seek specialist help in relation to their use of these drugs. The early identification of problems is paramount to reducing harm. Work is required in this area in order to determine the health needs of this group and the barriers that they face in engaging with services.

12. Links to sport

Background

12.1 The increasing use of performance-enhancing substances ('doping') from 1945 onwards by elite athletes (Dimeo, 2007) led to concern by those governing sport that their use could damage both the health of the athlete and sport. Enmeshed within this were the anabolic steroids which began to be used from the 1950s (Dimeo, 2007; Fair, 2000; Hoberman, 2005). Ultimately, such concern led to policy measures at both the international and national level that were designed to eliminate the use these substances in sport. These included, defining 'doping', the creation of a list of banned substances (and methods), as well as the introduction of 'doping control' (including drug tests) (Dimeo, 2007; House of Commons Science and Technology Committee, 2007). As an extension to these anti-doping activities the World Anti-Doping Agency (WADA) was created in 1999 with the aims to:

- To protect the Athletes' fundamental right to participate in doping-free sport and thus promote health, fairness and equality for Athletes worldwide, and;

- To ensure harmonized, coordinated and effective anti-doping programs at the international and national level with regard to detection, deterrence and prevention of doping. (World Anti-Doping Agency 2008).

12.2 As nation states are not legally bound by the World Anti-Doping Code, the UNESCO International Convention Against Doping in Sport (UNESCO, 2005) was drafted whose ratification, acceptance, approval or accession allows national governments to accept WADA and the World Anti-Doping Code.

12.3 The United Kingdom has adopted and ratified the UNESCO International Convention Against Doping in Sport. As such the UK Government and Devolved Administrations are committed to 'promote the prevention of and the fight against doping in sport' (UNESCO 2005, 2). These aims are met through the framework of the UK National Anti-Doping Policy (UK Anti-Doping, 2009), issued by the Secretary of State for Culture, Media and Sport and counterparts in the Devolved Administrations. The policy is based, in part, on the States Parties obligations set out in UNESCO International Convention Against Doping in Sport (which in turn is based, in part, on the World Anti-Doping Code) and set within the framework of existing relevant UK legislation and policy (UK Anti-Doping, 2009a). The policy is discharged by UK Anti-Doping, which is the main policy advisor to the UK Government in relation to preventing the use of doping in sport and the National Anti-Doping Agency for the UK. The policy also lists the roles

and responsibilities of its partners, including the Sports Councils (UK Anti-Doping, 2009a:13–14); National Governing Bodies (UK Anti-Doping, 2009a:15–24), and the National Anti-Doping Panel (UK Anti-Doping, 2009a:25). Broadly the objectives of UK Anti-Doping (UK Anti-Doping, 2009a) are:

- To prevent and deter doping through education programmes about the effects of, and rules related to, doping and the testing regime to which athletes will be subject.

- To take on existing testing and education responsibilities from UK Sport, whilst also being granted significant new powers to ensure Britain is best-placed to tackle doping in sport in the run-up to the London 2012 and beyond.

- To undertake 'doping control' (UK Anti-Doping, 2009b; UNESCO, 2005:3), including:

- To test athletes for performance-enhancing substances and/or methods on the Prohibited List (UK Anti-Doping, 2009b).

- Case presentation and disposal against an athlete or support personnel who violate the UK Anti-Doping Rules (UK Anti-Doping, 2009b). Therein, Anti-Doping Rule Violations (subject to sanctions) for an athlete (and where relevant, athlete support personnel) include, *inter alia*, use, attempted use, possession, trafficking or attempted trafficking, administration or attempted administration of a substance or method on the Prohibited List (UK Anti-Doping, 2009b; WADA 2009).

- To collaborate and exchange intelligence with law enforcement agencies to interfere with the supply of performance-enhancing substances and identify athletes or athlete support personnel that might be involved in doping.

13. Recommendations

Legal status

13.1 In the United Kingdom, anabolic steroids are classified under the Misuse of Drugs Act 1971 as Class C substances; this puts them in the same Class as buprenorphine and ketamine. Anabolic steroids are placed in Part 2 of Schedule 4 to the Misuse of Drugs Regulations 2001 (as amended).

Licit anabolic steroids can only be sold by pharmacists through a doctor's prescription. It is legal to possess or import steroids as long as they are intended for personal use and in a medicinal form. However, the possession or importing with intent to supply is illegal and could lead up to 14 years in prison and an unlimited fine.

Overall, the ACMD consider that the legislative framework should be strengthened primarily through greater enforcement (not legislative changes) with a focus on importation via on-line ordering. In addition, the ACMD recommend (see recommendation 4) that further restrictions should be placed on personal importation by having personal custody requirements.

Recommendation 1

13.2 Anabolic steroids should continue to be controlled as Class C drugs under the Misuse of Drugs Act 1971. The ACMD consider that the evidence base regarding the harms of anabolic steroids does not support a change in classification status. The ACMD consider that the harms associated with anabolic steroid use are commensurate with other Class C drugs.

Recommendation 2

13.3 The ACMD do not believe the term ‘medicinal product’ assists in the enforcement or legal framework for anabolic steroids under the Misuse of Drugs Act 1971. The ACMD consider that the term ‘medicinal product’ should be removed from the legislation as the term does not serve a recognised purpose (reference paragraphs 5.3 – 5.5).

Recommendation 3

13.4 The ACMD consider that although a small number deaths have been attributed to liver damage associated with steroid use, the health related harms associated with the use of anabolic steroids, are not of the severity of those associated with a number of other Class C drugs e.g. gamma-hydroxybutyrate, or ketamine –which can be life threatening in overdose, or benzodiazepines which carry dependence liability. For this reason the ACMD continues to believe that it should not be an offence under the Misuse of Drugs Act 1971 to simply possess anabolic steroids for personal

use. Criminal prosecution should be limited to illicit steroid dealers, suppliers, manufacturers and traffickers who profit from this trade.

Retaining the lack of a possession offence emphasises the ongoing need to focus on public health. The ACMD concludes that improved tailored intervention and education messages aimed at anabolic steroid users would be more effective than criminalising users and further pushing the issue underground.

Restrict the method of importation to personal custody

13.5 The current legal framework permits imports (or exports) of steroids for self-administration. There is no requirement that the drugs have to be personally transported/ imported. This can pose problems where steroids are imported via post or courier (i.e. items are unattended in transit). Border force officials can be unable, in these circumstances, to determine whether the products are for personal use as they are unable to question the importer at point of entry and may not necessarily be able to identify the importer from the import declaration. To establish whether imported items are for personal use will necessarily involve a potentially costly investigation by UK Border Force officials as to the circumstances in which the drugs are being imported.

Recommendation 4

13.6 Further restriction should, after consideration in the context of the EU legislation, be placed on the importation, and exportation, exemption, namely personal custody on importation.

13.7 Anabolic steroids are currently freely available for on-line ordering by various web sites. There is no restriction on these and little or no quality control. Imposition of a personal custody requirement for importation would make such purchases illegal.

Harm Reduction Measures

13.8 There is very little centrally co-ordinated information is available on harm reduction and users sometimes receive ambiguous information in relation to harms associated with anabolic steroids.

Recommendation 5

13.9 There is a need for widespread, credible, information and advice for users to counteract the flood of mis-information provided by various web sites that actively promote anabolic steroid use. Such information should be available in, for example, GP surgeries, clinics, gyms, NEP's and PCT's settings etc. The ACMD recommend that FRANK would be a suitable vehicle for this campaign. However, promulgation of the information should be wide enough so as to reach users in all settings. Gym based organisations (e.g. the Fitness Industry Association (FIA), Body Building

Federation and other professional bodies) should be encouraged to be involved.

Recommendation 6

13.10 The ACMD recommend there should be greater focus on users of image/performance enhancement substances, including anabolic steroid [9] and human growth hormones, who present to Needle Exchange Schemes; this may include dedicating special sessions to cater for image/performance enhancement substance users, who may be reluctant to associate/mix with mainstream opioid user groups. The ACMD believe the National Treatment Agency should afford this issue greater recognition. The ACMD considers that a concerted effort should be made to address current and future levels of blood borne viruses' among users of anabolic steroids and associated substances.

13.11 The ACMD recognises the contribution of those services, although limited in number, dedicated to anabolic steroid users, and the range of services they afford to anabolic steroid users.

Recommendation 7

13.12 There should be greater awareness of current centres for support; e.g. DISCUS and Smart Muscle- and additional centres of good practice should be developed to raise the profile of the issues associated with anabolic steroid use and the knowledge of individuals involved with harm reduction should be improved.

Research

Recommendation 8

13.13 Improved data on users should be gathered to better inform interventions. Specifically, this data gathering should be centred on gyms and health clubs and includes: numbers using; duration of time that people use them for and other such patterns of behaviour.

Recommendation 9

13.14 As the data is lacking as to the specific anabolic steroids that are used, NEP's should collate data on what users are actually administering. Chemical analysis of used vials could assist this objective.

Recommendation 10

13.15 The British Crime Survey is not constructed to adequately assess the prevalence of anabolic steroid use. Other channels should be utilised to

[9] Including human growth hormones and other performance enhancing associated substances; as users may use anabolic steroids, human growth hormones and other associated substances in conjunction with one another; therefore services should cater for the users of all performance enhancing substance.

gain better data on prevalence. A survey of the UK general population to focus on particular sub-groups – children and young people should be constructed. This should be designed to gather a better national profile of anabolic steroid use with the purpose of considering targeted health interventions.

Recommendation 11

13.16 A national survey and survey of gym users should allow better data to be gathered on the prevalence of blood borne viruses among anabolic steroid users.

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