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Resource Guide

Drugs in Sport

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Drugs in Sport – Reference Material

The use of performance-enhancing drugs

Although the use of performance-enhancing drugs is primarily associated with athletes participating at the elite and sub-elite level, there is evidence available to show that the use of such drugs has also spread to lower levels of competition, including under-age sport.

The reality of modern-day sport is that many athletes now compete under the influence of a cocktail of drugs. Reports of an athlete failing a drug test have become almost a regular feature in newspapers and on the television nightly news. A survey of past and aspiring Olympians that appeared in *Sports Illustrated* magazine in the late 1990s, reported that all but three of the 198 athletes surveyed would take a hypothetical banned drug if it were guaranteed they would win but not be caught.

In a 1997 *Sports Illustrated* interview, Dutch doctor Michel Karsten who claims to have prescribed anabolic steroids to hundreds of world-class athletes, was quoted as saying that very few athletes can win gold medals without taking drugs. 'If you are especially gifted, you may win once, but from my experience you can't continue to win without drugs. The field is just too filled with drug users'.

A brief history of drugs in sport

The use of performance-enhancing drugs and substances is not a recent phenomenon. Their use has been around for a long time and is evident throughout the history of sport. As far back as the ancient Greek Olympics (circa 400 BC) there is evidence to suggest that competitors were willing to ingest any preparation that might enhance their performance, including extracts of mushrooms and plant seeds.

During the ancient Roman period the use of performance-enhancing 'drugs' has also been recorded. Chariot racers fed their horses a potent mixture of herbs and plant extracts to make them run faster, while many gladiators were 'doped-up' to make their fights sufficiently vigorous and bloody for the paying public.

The first documented modern case of doping surfaced in 1865 with Dutch swimmers using various stimulants. By the late 19th century, European cyclists were drugging themselves with a variety of substances including caffeine and ether-coated sugar cubes to allay the pain and exhaustion endemic to their sport.

In 1896, the first recorded death of an athlete from performance-enhancing drugs was said to have occurred when the cyclist Arthur Linton died after a supposed overdose of trimethyl (although the official cause of death was listed as typhoid fever). By the time of the first modern Olympics in 1896, a broad array of performance-enhancing substances was in currency, from codeine to strychnine. In the 1904 Olympics, American marathon runner Thomas Hicks had to be revived by doctors after ingesting brandy laced with cocaine and strychnine.

By the 1930s, sprinters were experimenting with nitroglycerine and strychnine. But the real modern doping era started with the introduction of injectable **testosterone** in 1935. Developed by Nazi doctors to promote aggression in their troops, testosterone found its way onto the athletic field with Germany's 1936 Berlin Olympics team.

In the 1950s Soviet athletes used testosterone to great effect, especially during the 1952 Helsinki Olympics. The sudden and unexpected success of the Soviet team raised a lot of eyebrows. Soon, other athletes throughout the world were also using injectable testosterone.

In 1955, John Ziegler, physician for the US weight-lifting team, developed a modified synthetic testosterone molecule with enhanced tissue-building properties. This was the first synthetic **anabolic steroid**. Its chemical name was methandrostenolone and its trade name was Dianabol. Dianabol was soon used by weight-lifters, football players, and track-and-field athletes to enhance protein synthesis and assist muscles to recover more quickly from the stress of training.

By the 1960s, a wide variety of anabolic compounds had become available. However, it was not until the televised death of cyclist Tommy Simpson in the 1967 Tour de France (figure 12.10) that the International Olympic Committee (IOC) became actively involved in establishing antidoping initiatives.

The year 1968 began a watershed period for anabolic steroid use with what was then East Germany institutionalising the most comprehensive, state-run doping program ever devised. The success of East German athletes throughout the 1970s and early 1980s was testimony to the success of their drug-use protocols, but it often came at a high price for athletes such as Heidi Krieger.

Ironically, it was in 1968 that the IOC decided on a definition of doping and developed a list of banned substances. Drug testing was introduced at the 1968 Mexico City Olympics, just as the drug pandemic exploded. Governments and international and national sporting organisations, however, continued to implement antidoping initiatives throughout the 1970s, and drug testing became a more common feature of high-level sporting competition. Unfortunately, the fact that testing programs were in operation did not guarantee their effectiveness. Not only were positive drug tests limited because of inadequate technology, but athletes quickly learned how to beat the system. Methods of evasion include the substitution of urine samples and stopping the consumption of a drug in sufficient time to clear all traces from the body prior to a drug test.

Perhaps the most infamous case of drug use and detection occurred during the 1988 Seoul Olympics, when Canadian sprinter Ben Johnson tested positive for a banned anabolic steroid (stanozolol), and was stripped of his 100-metres gold medal. He was also suspended from competition for two years. The development of increasingly sophisticated testing procedures for anabolic steroids led athletes to experiment with other drugs and substances that could not be detected using current testing procedures. In the early 1980s athletes began to experiment with the use of **human growth hormone (hGH)**. Initial experience was mixed. Most dosages needed to be low due to the very high cost and limited availability of the substance. The development of recombinant, synthetic hGH in the mid-1980s led to a widespread increase in availability and a huge drop in price. In sufficient dosages, hGH proved to be a powerful performance enhancer, especially for power and sprint athletes.

Both the natural form and the synthetic form had the added advantage of being undetectable. The increase in the use and sophistication of drug-testing procedures was met with even more sophisticated drug-taking protocols. Testosterone ratio tests were met with the administration of epitestosterone along with testosterone to maintain an acceptable ratio. Limits on epitestosterone were met with the use of human chorionic gondatrophin (hCG) to restore natural testosterone ratios. Frequent drug testing led to the use of masking and blocking agents such as probenecid.

In the 1990s, **erythropoietin (EPO)** became the drug of choice among many endurance athletes. EPO is naturally produced in the body to stimulate the production of red blood cells. Because red bloods carry oxygen, an increase in the number of red blood cells leads to an increase in the oxygen-carrying capacity of the body, and therefore an improvement in endurance performance.

Accurately identifying injected EPO (recombinant erythropoietin, or rEPO) in the blood presents a significant challenge, specifically because EPO is a naturally occurring hormone in the body. In addition, the drug is broken down quickly, becoming virtually undetectable — even though the performance-enhancing benefits remain. It was not until the 2000 Sydney Olympics that a test for EPO was utilised.

Despite more and more sophisticated drug-testing procedures and the establishment in 1999 of the World Anti-Doping Agency (WADA), the incidence of athletes testing positive to banned performance-enhancing drugs continued to be widespread. High-profile athletes such as men's 100-metre world record holder Tim Montgomery and multiple Sydney Olympic gold medallist Marion Jones were among the athletes to have been allegedly involved in doping scandals during the period 2000–04.

The 2004 Athens Olympics were the first to follow the introduction of WADA's global anti-doping code. The opening days were overshadowed by controversy surrounding modern-day Greek athletic heroes Kostas Kenteris and Katerina Thanou. Kenteris was the reigning men's 200-metre gold medallist and Thanou the reigning women's 100-metre silver medallist. The Greek sprinters missed a drugs test just prior to the 2004 Olympics in unexplained circumstances and finally withdrew from the competition.

From the lead up to the 2004 games to the end of competition, 3000 drug tests were carried out: 2600 urine tests and 400 blood tests. From these, 23 athletes were found to have taken a banned substance, the most ever in an Olympics. Ten of the men's weight-lifting competitors were excluded. Figures such as these are evidence that the use of performance-enhancing drugs in sport remains a real concern.

Performance-enhancing drugs and methods

Performance-enhancing substances and methods have been employed by athletes and coaches for a variety of reasons:

- to increase strength and muscle mass (anabolic agents, steroids)
- to counteract undesirable side effects (hormones, anti-oestrogenic substances)
- to mask the presence of banned substances (diuretics)
- to increase alertness and/or aggressiveness (caffeine, amphetamines)
- to reduce pain (narcotics).

It is both unethical and illegal in sport to use the performance-enhancing drugs and methods in this table. Athletes caught using these drugs have been stripped of their medals and records and banned from their sports, sometimes for years and, on occasions, for life. Many of these drugs also pose serious potential health risks.

Why do athletes take drugs?

There are a number of general factors that may contribute to an athlete misusing drugs. These factors can be related to the drug, the athlete or the athlete's environment.

The drug

- Side effects
- Ease of availability
- Legal status
- Physical dependency

The athlete

- Dissatisfaction with performance and progress
- Psychological dependency
- Desire to cope with anxiety or stress
- Desire to relax/socialise
- Values (using drugs may not be considered a problem)
- Belief that others are using drugs
- Temptation to think they can get away with it
- Being easily influenced by others
- Lack of knowledge about side effects
- Lack of confidence.

The environment

- Friends or other athletes using drugs
- Culture of the sport
- Pressure to win from coach, parents, public, media
- Financial reward
- Prestige and fame
- Advertising
- Influence of role models
- Unrealistic qualifying standards or performance expectations
- National pride

Pressures

These factors may be broken down into more specific pressures that will influence an athlete's decision.

Self

The basic desire to be successful and satisfy ego requirements is a major source of internal pressure. Problems such as self-doubt, lack of confidence, nervousness, stress and depression are common to all athletes. The characteristics of self pressure are not exclusive to people in the sporting field.

Coaches

A successful athlete is often associated with a successful coach. As a result, the coach may place direct pressure on an athlete to perform and may be the source of further internal pressure.

Peers

Fellow competitors set the standards to which an athlete must perform. If an athlete believes that a competitor has obtained some kind of advantage, then the pressure to also have or use this advantage is significant; for example, a better-designed golf club, a lighter running shoe or the use of steroids. Similar peer-group pressure may come from teammates.

Family

The expectations of family and friends are often a source of pressure, particularly at the lower levels of competition. Previously successful family members may also create pressure.

Spectators/crowd

Spectators create a great source of pressure both at the elite and lower levels of competition. At the elite level, athletes are often adopted as role models and will take the hopes and aspirations of thousands of fans into the competition. Spectators are also the source of money and applause, hence the athlete may feel pressure to perform to standards expected by the public.

The fickle nature of public support also creates pressure. Generally, we all love a winner and often adopt a 'win at all costs' mentality. At the lower level of competition the presence of spectators may increase the anxiety levels of athletes. This may affect an athlete's performance and in due course influence an athlete's behaviour.

Media

The media plays an important role in shaping the opinions and attitudes of the general public. How the media portrays an athlete, and how they report on an athlete's performance, not only influences the public but the athlete as well.

Administrators/promoters

Unreasonable scheduling of competitions and the establishment of unrealistic performance standards are ways in which sports administrators may contribute to the pressure on athletes. Similarly, promoters of sports events usually demand a high standard of performance from athletes to enhance the credibility and the promotional qualities of events they sponsor.

Social factors

Pressure for sporting success may also be the result of social incentives to achieve. The glory and recognition for sporting achievements is a strong motivator towards success. Sporting success may provide an athlete with greater access and mobility to other social groups; for example, the opportunity to meet and mix with politicians and media personalities.

Financial and material rewards

Financial and material rewards are major influences on athletes' sporting performances. Sport, which was once an activity to fill in leisure time, has now become a way to earn a living for some of our elite athletes.

In recent times people have commented that money-making principles have begun to replace moral principles. Enormous salaries, product endorsements and potential careers outside the sporting field are some of the rewards available to the successful athlete. Rewards are also available to athletes at lower levels of competition and to those in amateur sport. Even at junior levels, inducements such as scholarships are a significant incentive and can increase the pressure to achieve.

National/political/ideological

Successful athletes at the highest level are sometimes elevated to the position of hero and carry with them the pressures of national honour and pride. Countries also use their athletes as political weapons. In international competition, one country's sporting success over another country is often viewed as proof of ideological or national superiority.

Such is the case in the Olympics, where enormous emphasis is placed on the number of gold medals won by a country, with even greater pressure being placed on the host country.

Questions to think about

- What are some of the specific pressures that athletes face that may influence them to resort to the use of performance-enhancing drugs or other ethically questionable practices?
- Which factors do you think place greatest pressure on athletes?
- What can athletes do to combat or resist these pressures?
- What advice would you give an athlete who confides to you that they are considering the use of a particular illegal or unethical performance-enhancing practice?

An alternative view: The case for allowing drugs in sport

It is widely accepted that taking banned substances or using banned methods is cheating, unfair and contrary to the ethics of sport and fair play.

However, not everyone agrees with the viewpoint that drugs should be banned from sport. Some people argue — among them eminent scientists, sports writers and commentators — that such is the widespread nature of drug use in sport, and the ineffectiveness of drug-testing procedures, that it would be fairer to all involved to legally allow the use of performance-enhancing substances, provided they do not excessively expose athletes to health risks. The following article presents some of the arguments in favour of removing the ban on performance enhancing drugs

Good sport, bad sport

August 3, 2004

It's too late to stop an Olympics fuelled on drugs, write Julian Savulescu and Bennett Foddy, so why not view drug use as a way to even nature's odds?

Scandals are already rocking the Olympics and the starting gun hasn't even fired. Long gone is the romantic ideal of Pheidippides running barefoot from the village of Marathon, demonstrating a test of brute human endurance, courage and spirit. The reality is that many athletes now compete on a drug cocktail. Performance-enhancing drugs, however, have been around a long time. Early Olympians used extracts of mushrooms and plant seed. In the modern era, chemistry has helped the cheats. It barely raises an eyebrow now when some famous athlete fails a dope test.

Attempts to eliminate drugs from sport have patently failed. And will fail. The drive to perfect performance is irresistible. In the late 1990s, Sports Illustrated reported a survey by Dr Robert Goldman of past and aspiring Olympians. Goldman asked athletes if they would take an imaginary banned drug if it was guaranteed that they would not be caught and that they could win. The results were compelling 195 said they would take it and only three said they would not.

In 1997, Dutch physician Michel Karsten, who claims to have prescribed anabolic steroids to hundreds of worldclass athletes, told Sports Illustrated that very few athletes can win gold medals without taking drugs. "If you are especially gifted, you may win once, but from my experience you can't continue to win without drugs. The field is just too filled with drug users."

Drugs like Erythropoietin (EPO) and growth hormone occur naturally in the body. As technology advances, drugs have become harder to detect because they mimic natural processes. In a few years, many will be undetectable. The goal of "cleaning" up sport is hopeless. And further down the track the spectre of genetic enhancement looms dark and large.

So is cheating here to stay? Drugs are against the rules, but we can redefine the rules of sport. If we made drugs legal and freely available, there would be no cheating. But would that be against the "spirit of sport", as Raelene Boyle has said?

The Athenian vision of sport was to find the strongest, fastest or most skilled man. Drugs that improve our natural potential are against the spirit of this model of sport. But this does not need to be the only model. We can choose what kind of competitor to be, not just through training, but through biological manipulation that is, by taking drugs. Far from being against the spirit of sport, biological manipulation embodies the human spirit the capacity to change ourselves on the basis of reason and judgement. When we exercise our reason, we do what only humans have the ability to do.

Taking drugs would make sport less of a genetic lottery. Winners would be those with a combination of the genetic potential, training, psychology and judgement with performance enhanced by drugs the result of creativity and choice. Unfair?

Carl Lewis once said, "To be the best, work the hardest." Wouldn't it be wonderful if the fairytale were true? Sadly, it is not. Sport discriminates against the genetically unfit. Genetic tests can already identify those with the greatest potential. If you have one version of the ACE gene, you will have endurance. Another gene will predispose you to win at short events. Black Africans, for example, generally fare better at short-distance events because of biologically advantageous muscle type and bone structure.

Sport is the province of the genetic elite, or freak. The starkest example is the Finnish skier Eoro Maentyranta. In 1964, he won two gold medals. Subsequently, it was found he had a genetic mutation that meant that he "naturally" had 40-50 per cent more red blood cells than the average competitor. Was it fair that chance gave him a significant advantage?

The ability to perform well in sporting events is determined by the ability to deliver oxygen to muscles. The more red blood cells you have, the more oxygen you can carry. EPO is a natural hormone that stimulates red blood cell production, raising the haematocrit (HCT) the percentage of the blood comprised by red blood cells.

EPO is produced in response to anaemia, haemorrhage, pregnancy, or living at high altitude. At sea level, the average person has an HCT of 40-50 per cent. HCT naturally varies 5 per cent of people have a HCT above 50 per cent. Raising the HCT too high can cause health problems. Your risk of harm rapidly rises as HCT gets above 50 per cent, especially if you also have high blood pressure.

In the late '80s, several Dutch cyclists died because too much EPO made their blood too thick. When your HCT is over 70 per cent, you are at high risk of stroke, heart and lung failure.

Use of EPO is endemic in cycling and many other sports. In 1998, the Festina team was expelled from the Tour de France after trainer Willy Voet was caught with 400 vials of performance-enhancing drugs. The following year, the World Anti-Doping Agency (WADA) was established as a result of the scandal. However, EPO is extremely hard to detect and its use has continued. Members of the Chinese swim team, which won four swimming gold medals at the 1992 Barcelona Olympics and then took 12 of the 16 women's titles at the 1994 world championships, have used EPO (along with testosterone, anabolic steroids and growth hormone).

In addition to trying to detect EPO directly, the International Cycling Union requires athletes to have a HCT no higher than 50 per cent. But 5 per cent of people have a natural HCT greater than 50 per cent. Athletes with a naturally elevated level of HCT cannot race unless doctors can prove their HCT is natural.

Charles Wegelius was a British rider who was banned and then cleared in 2003. He had had his spleen removed in 1998 following an accident since the spleen removes red blood cells, this increased his HCT.

There are other legal ways to increase the number of red blood cells. Altitude training can push the HCT to dangerous, even fatal, levels. More recently, hypoxic air machines simulate altitude training. The body responds by releasing natural EPO and growing more blood cells, so that the body may absorb more oxygen with every breath. According to Tim Seaman, a US athlete, the hypoxic air tent has "given my blood the legal 'boost' that it needs to be competitive at the world level."

There is no difference between elevating your blood count by altitude training, by using a hypoxic air machine or by taking EPO. But the latter is illegal. Some competitors have high HCTs and an advantage by luck. Some can afford hypoxic air machines. Is this fair? Nature is not fair.

Ian Thorpe has size 17 feet, which give him an advantage that no other swimmer can get, no matter how much they exercise. Some gymnasts are more flexible, and some basketball players are seven feet tall. By allowing everyone to take performance enhancing drugs, we level the playing field. We remove the effects of genetic inequality. Far from being unfair, allowing performance enhancement promotes equality.

Should there be any limits to drugs in sport? Yes, the one limit is safety. We do not want an Olympics in which people die before, during or after competition. Rather than testing for drugs, we should focus more on health and fitness to compete. Forget testing for EPO; test for HCT. We need to set a safe level of HCT. Currently that is 50 per cent. Anyone above that level, whether through the use of drugs, training or natural mutation, should be prevented from participating on safety grounds.

If someone naturally has a HCT of 60 per cent and is allowed to compete, then that risk is reasonable and everyone should be allowed to increase HCT to 60 per cent. What matters is what is a safe level of EPO (or other hormones) not whether that is achieved naturally or artificially.

We need to take safety more seriously. In Goldman's survey, athletes were also asked whether they would take a banned drug if it was guaranteed that they would not be caught and that they would win every competition they entered for the next five years, but then die from the side effects of the substance. More than 50 per cent of the athletes said yes.

We should permit drugs that are safe, and continue to ban and monitor drugs that are unsafe. This would be fairer in another way: provided a drug is safe, it is unfair to the honest athletes that they have to miss out on an advantage that the cheaters enjoy. Taking EPO up to the safe level, say 50 per cent, is not a problem. This allows athletes to correct for natural inequality.

However, we should focus on detecting drugs like anabolic steroids because they are harmful not because they enhance performance. Far from harming athletes, paradoxically such a proposal may protect our athletes. There would be more rigorous and regular evaluation of athletes health and fitness to perform. Moreover, the current incentive is to develop undetectable drugs, with little concern for safety. If safe performance-enhancement drugs were permitted, there would be greater pressure to develop safe drugs.

We have two choices: to vainly try to turn the clock back, or to rethink who we are and what sport is, and to make a new 21st-century Olympics. Not a super-Olympics but a more human Olympics. Our crusade against drugs in sport has failed. Rather than fearing drugs in sport, we should embrace them. Performance enhancement is not against the spirit of sport; it is the spirit of sport. To choose to be better is to be human.

Professor Julian Savulescu holds the Uehiro Chair in Practical Ethics at the University of Oxford; he is also part of the Melbourne-Oxford Stem Cell Collaboration. Bennett Foddy is a doctoral student at Murdoch Children's Research Institute.

Questions to think about

- What arguments are outlined in the article to advocate the removal of the ban on drugs in sport?
- Which of these arguments do you agree or disagree with?
- According to the authors of the article, what limit (if any) should there be on drugs in sport?
- Do you think it would be fairer for all to simply allow the use of drugs in sport? Give reasons for your response.

Source: Live It Up 2nd Edition

Notes

The 2010 Prohibited List

World Anti-Doping Code

Valid 1 January 2010

All Prohibited Substances shall be considered as "Specified Substances" except Substances in classes S1, S2.1 to S2.5, S.4.4 and S6.a, and Prohibited Methods M1, M2 and M3.

Substances and Methods Prohibited at All Times (In- and Out-Of-Competition) Prohibited Substances

S1. Anabolic Agents

Anabolic agents are prohibited.

1. Anabolic Androgenic Steroids (AAS)

a. Exogenous* AAS, including:

1-androstendiol (5a-androst-1-ene-3β,17β-diol)**; 1-androstendione** (5a- androst-1-ene-3,17-dione)**; bolandiol** (19-norandrostenediol)**; bolasterone; boldenone; boldione** (androsta-1,4-diene-3,17-dione)**; calusterone; clostebol; danazol** (17a-ethynyl-17β-hydroxyandrost-4-eno[2,3-d]isoxazole)**; dehydrochlormethyltestosterone** (4-chloro-17β-hydroxy-17a-methylandrosta-1,4-dien-3-one)**; desoxymethyltestosterone** (17a-methyl-5a-androst-2-en-17β-ol)**; drostanolone; ethylestrenol** (19-nor-17a-pregn-4-en-17-ol)**; fluoxymesterone; formebolone; furazabol** (17β-hydroxy-17a-methyl-5a- androstano[2,3-c]-furazan)**; gestrinone; 4-hydroxytestosterone** (4,17β- dihydroxyandrost-4-en-3-one)**; mestanolone; mesterolone; metenolone; methandienone** (17β-hydroxy-17a-methylandrosta-1,4-dien-3-one)**; methandriol; methasterone** (2a, 17a-dimethyl-5a-androstane-3-one-17β-ol)**; methyldienolone** (17β-hydroxy-17a-methylestra-4,9-dien-3-one)**; methyl-1- testosterone** (17β-hydroxy-17a-methyl-5a-androst-1-en-3-one)**; methylnortestosterone** (17β-hydroxy-17a-methylestr-4-en-3-one)**; methyltestosterone; metribolone** (methyltrienolone, 17β-hydroxy-17a- methylestra-4,9,11-trien-3-one)**; mibolerone; nandrolone; 19- norandrostenedione** (estr-4-ene-3,17-dione)**; norboletone; norclostebol; norethandrolone; oxabolone; oxandrolone; oxymesterone; oxymetholone; prostanozol** (17β-hydroxy-5a-androstano[3,2-c] pyrazole)**; quinbolone; stanozolol; stenbolone; 1-testosterone** (17β-hydroxy-5a-androst-1-en-3-one)**; tetrahydrogestrinone** (18a-homo-pregna-4,9,11-trien-17β-ol-3-one)**; trenbolone** and other substances with a similar chemical structure or similar biological effect(s).

b. Endogenous** AAS when administered exogenously:

androstenediol (androst-5-ene-3β,17β-diol)**; androstenedione** (androst-4-ene- 3,17-dione)**; dihydrotestosterone** (17β-hydroxy-5a-androstan-3-one) **; prasterone** (dehydroepiandrosterone, DHEA)**; testosterone** and the following metabolites and isomers: **5a-androstane-3a,17a-diol; 5a-androstane-3a,17β-diol; 5a-androstane- 3β,17a-diol; 5a-androstane-3β,17β-diol; androst-4-ene-3a,17a-diol; androst-4-ene-3a,17β-diol; androst-4-ene-3β,17a-diol; androst-5-ene-3a,17a-diol; androst-5-ene-3a,17β-diol; androst-5-ene-3β,17a-diol; 4-androstenediol** (androst-4-ene-3β,17β-diol)**; 5-androstenedione** (androst- 5-ene-3,17-dione)**; epi-dihydrotestosterone; epitestosterone; 3a-hydroxy-5a-androstan-17-one; 3β-hydroxy-5a-androstan-17-one; 19-norandrosterone; 19 noretiocholanolone.**

2. Other Anabolic Agents, including but not limited to:

Clenbuterol, selective androgen receptor modulators (SARMs), tibolone, zeranol, zilpaterol.

For purposes of this section:

- * *exogenous* refers to a substance which is not ordinarily capable of being produced by the body naturally.
- ** *endogenous* refers to a substance which is capable of being produced by the body naturally.

S2. Peptide Hormones, Growth Factors and Related Substances

The following substances and their releasing factors are prohibited:

1. Erythropoiesis-Stimulating Agents [e.g. erythropoietin (EPO), darbepoetin (dEPO), methoxy polyethylene glycol-epoetin beta (CERA), hematide];

2. Chorionic Gonadotrophin (CG) and Luteinizing Hormone (LH) in males;

3. Insulins;

4. Corticotrophins;

5. Growth Hormone (GH), Insulin-like Growth Factor-1 (IGF-1), Mechano Growth Factors (MGFs), Platelet-Derived Growth Factor (PDGF), Fibroblast Growth Factors (FGFs), Vascular-Endothelial Growth Factor (VEGF) and Hepatocyte Growth Factor (HGF) as well as any other growth factor affecting muscle, tendon or ligament protein synthesis /degradation, vascularisation, energy utilization, regenerative capacity or fibre type switching;

6. Platelet-derived preparations (e.g. Platelet Rich Plasma, "blood spinning") administered by intramuscular route. Other routes of administration require a declaration of Use in accordance with the International Standard for Therapeutic Use Exemptions. and other substances with similar chemical structure or similar biological effect(s).

S3. Beta-2 Agonists

All beta-2 agonists (including both optical isomers where relevant) are prohibited except salbutamol (maximum 1600 micrograms over 24 hours) and salmeterol by inhalation which require a declaration of *Use* in accordance with the International Standard for Therapeutic Use Exemptions.

The presence of salbutamol in urine in excess of 1000 ng/mL is presumed not to be an intended therapeutic use of the substance and will be considered as an *Adverse Analytical Finding* unless the *Athlete* proves, through a controlled pharmacokinetic study, that the abnormal result was the consequence of the use of a therapeutic dose (maximum 1600 micrograms over 24 hours) of inhaled salbutamol.

S4. Hormone Antagonists and Modulators

The following classes are prohibited:

1. Aromatase inhibitors including, but not limited to:

aminoglutethimide, anastrozole, androsta-1,4,6-triene-3,17-dione (androstatrienedione), 4-androstene-3,6,17 trione (6-oxo), exemestane, formestane, letrozole, testolactone.

2. Selective estrogen receptor modulators (SERMs) including, but not limited to:

raloxifene, tamoxifen, toremifene.

3. Other anti-estrogenic substances including, but not limited to:

clomiphene, cyclofenil, fulvestrant.

4. Agents modifying myostatin function(s) including but not limited to:

myostatin inhibitors.

S5. Diuretics and Other Masking Agents

Masking agents are prohibited. They include:

> Diuretics, probenecid, plasma expanders (e.g. glycerol; intravenous administration of albumin, dextran, hydroxyethyl starch and mannitol) and other substances with similar biological effect(s).

Diuretics include:

> Acetazolamide, amiloride, bumetanide, canrenone, chlorthalidone, etacrynic acid, furosemide, indapamide, metolazone, spironolactone, thiazides (e.g. bendroflumethiazide, chlorothiazide, hydrochlorothiazide), triamterene, and other substances with a similar chemical structure or similar biological effect(s) (except drosperinone, pamabrom and topical dorzolamide and brinzolamide, which are not prohibited).

A Therapeutic Use Exemption for diuretics and masking agents is not valid if an *Athlete*'s urine contains such substance(s) in association with threshold or subthreshold levels of an exogenous *Prohibited Substance*(s).

Prohibited Methods

M1. Enhancement of Oxygen Transfer

The following are prohibited:

1. Blood doping, including the use of autologous, homologous or heterologous blood or red blood cell products of any origin.

2. Artificially enhancing the uptake, transport or delivery of oxygen, including but not limited to perfluorochemicals, efaproxiral (RSR13) and modified haemoglobin products (e.g. haemoglobin-based blood substitutes, microencapsulated haemoglobin products), excluding supplemental oxygen.

M2. Chemical and Physical Manipulation

1. *Tampering*, or attempting to tamper, in order to alter the integrity and validity of *Samples* collected during *Doping Controls* is prohibited. These include but are not limited to catheterisation, urine substitution and/or adulteration (e.g. proteases).

2. Intravenous infusions are prohibited except for those legitimately received in the course of hospital admissions or clinical investigations.

M3. Gene Doping

The following, with the potential to enhance athletic performance, are prohibited:

1. The transfer of cells or genetic elements (e.g. DNA, RNA);

2. The use of pharmacological or biological agents that alter gene expression. Peroxisome Proliferator Activated Receptor δ (PPARδ) agonists (e.g. GW 1516) and PPARδ-AMP-activated protein kinase (AMPK) axis agonists (e.g. AICAR) are prohibited.

Substances and Methods Prohibited In-Competition

In addition to the categories S1 to S5 and M1 to M3 defined previously, the following categories are prohibited in competition:

Prohibited Substances

S6. Stimulants

All stimulants (including both optical isomers where relevant) are prohibited, except imidazole derivatives for topical use and those stimulants included in the 2010 Monitoring Program*.

Stimulants include:

a: Non-Specified Stimulants:

Adrafinil; amfepramone; amiphenazole; amphetamine; amphetaminil; benfluorex; benzphetamine; benzylpiperazine; bromantan; clobenzorex; cocaine; cropropamide; crotetamide; dimethylamphetamine; etilamphetamine; famprofazone; fencamine; fenetylline; fenfluramine; fenproporex; furfenorex; mefenorex; mephentermine; mesocarb; methamphetamine(d-); p-methylamphetamine; methylenedioxyamphetamine; methylenedioxymethamphetamine; methylhexaneamine (dimethylpentylamine); modafinil; norfenfluramine; phendimetrazine; phenmetrazine; phentermine; 4-phenylpiracetam (carphedon); prenylamine; prolintane.

A stimulant not expressly listed in this section is a Specified Substance.

b: Specified Stimulants (examples):

Adrenaline**; cathine***; ephedrine****; etamivan; etilefrine; fenbutrazate; fencamfamin; heptaminol; isometheptene; levmetamphetamine; meclofenoxate; methylephedrine****; methylphenidate; nikethamide; norfenefrine; octopamine; oxilofrine; parahydroxyamphetamine; pemoline; pentetrazol; phenpromethamine; propylhexedrine; pseudoephedrine*****; selegiline; sibutramine; strychnine; tuaminoheptane and other substances with a similar chemical structure or similar biological effect(s).

- ** The following substances included in the 2010 Monitoring Program (bupropion, caffeine, phenylephrine, phenylpropanolamine, pipradol, synephrine) are not considered as Prohibited Substances.*
- *** **Adrenaline** associated with local anaesthetic agents or by local administration (e.g. nasal, ophthalmologic) is not prohibited.*
- **** **Cathine** is prohibited when its concentration in urine is greater than 5 micrograms per milliliter.*
- ***** Each of **ephedrine** and **methylephedrine** is prohibited when its concentration in urine is greater than 10 micrograms per milliliter.*
- ******** Pseudoephedrine** is prohibited when its concentration in urine is greater than 150 micrograms per milliliter.*

S7. Narcotics

The following narcotics are prohibited:

Buprenorphine, dextromoramide, diamorphine (heroin), fentanyl and its derivatives, hydromorphone, methadone, morphine, oxycodone, oxymorphone, pentazocine, pethidine.

S8. Cannabinoids

Natural or synthetic Δ9-tetrahydrocannabinol (THC) and THC-like cannabinoids (e.g. hashish, marijuana, HU-210) are prohibited.

S9. Glucocorticosteroids

All glucocorticosteroids are prohibited when administered by oral, intravenous, intramuscular or rectal routes.

In accordance with the International Standard for Therapeutic Use Exemptions, a declaration of *Use* must be completed by the *Athlete* for glucocorticosteroids administered by intraarticular, periarticular, peritendinous, epidural, intradermal and inhalation routes, except as noted below.

Topical preparations when used for auricular, buccal, dermatological (including iontophoresis/phonophoresis), gingival, nasal, ophthalmic and perianal disorders are not prohibited and require neither a Therapeutic Use Exemption nor a declaration of *Use*.

Substances Prohibited in Particular Sports

P1. Alcohol

Alcohol (ethanol) is prohibited *In-Competition* only, in the following sports.

Detection will be conducted by analysis of breath and/or blood. The doping violation threshold (haematological values) is 0.10 g/L.

- Aeronautic (FAI)
- Archery (FITA)
- Automobile (FIA)
- Karate (WKF)
- Modern Pentathlon (UIPM) for disciplines involving shooting
- Motorcycling (FIM)
- Ninepin and Tenpin Bowling (FIQ)
- Powerboating (UIM)

P2. Beta-Blockers

Unless otherwise specified, beta-blockers are prohibited *In-Competition only*, in the following sports.

- Aeronautic (FAI)
- Archery (FITA) (also prohibited *Out-of-Competition*)
- Automobile (FIA)
- Billiards and Snooker (WCBS)
- Bobsleigh (FIBT)
- Boules (CMSB)
- Bridge (FMB)
- Curling (WCF)
- Golf (IGF)
- Gymnastics (FIG)
- Motorcycling (FIM)
- Modern Pentathlon (UIPM) for disciplines involving shooting
- Ninepin and Tenpin Bowling (FIQ)
- Powerboating (UIM)
- Sailing (ISAF) for match race helms only
- Shooting (ISSF, IPC) (also prohibited *Out-of-Competition*)
- Skiing/Snowboarding (FIS) in ski jumping, freestyle aerials / halfpipe and snowboard halfpipe/big air
- Wrestling (FILA)

Beta-blockers include, but are not limited to, the following:

> Acebutolol, alprenolol, atenolol, betaxolol, bisoprolol, bunolol, carteolol, carvedilol, celiprolol, esmolol, labetalol, levobunolol, metipranolol, metoprolol, nadolol, oxprenolol, pindolol, propranolol, sotalol, timolol.

Source: www.wada-ama.org

Notes

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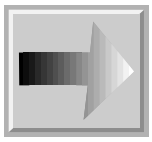

AFL and AFLPA Enhance Illicit Drugs Policy

The AFL has adopted a series of improvements and enhancements to its out-of-competition Illicit Drugs Policy as AFL players volunteer to step up their campaign against illicit drug use.

A trial of hair sample testing will be conducted when AFL players return from their holiday period this year – the first of its type in Australian sport.

Other policy changes include a further increase in testing of up to 1500 tests every year and the penalty for a third failed test extended to a maximum of 18 weeks, up from 12 weeks.

The changes to the out of competition Illicit Drug Policy were announced today by the AFL and the AFLPA, after extensive consultation and feedback from experts in the field of drug and alcohol prevention and treatment, the Federal Government and AFL clubs.

The AFL and the AFLPA said today that the changes demonstrated that AFL players, who had volunteered to undertake testing, were continuing to show leadership in the fight against drugs by volunteering to trial holiday period hair testing.

AFLPA President Joel Bowden also revealed that the players had approached the Federal Government to volunteer their assistance in national programs aimed at tackling the broader community-wide problem of illicit drug use.

"The steps we have taken as players are driven by a genuine concern for health and welfare of players, but given our high profile position we also see an opportunity to send a strong message to the community that using illicit drugs is incredibly dangerous," Bowden said.

AFL CEO, Andrew Demetriou said today that the AFL was one of only three sports in the country to have an out-of-competition policy that tested for illicit drugs.

"It is important to understand that the AFL has two drug policies – the AFL's 1990 Anti-doping code which tests for performance enhancing drugs 365 days a year, and is the same as all other sports in Australia, and the AFL's Illicit Drugs Policy which was introduced in 2005," Mr Demetriou said.

"Our Illicit Drugs Policy is above and beyond the WADA policy and is about testing players out of competition for illicit drugs that are harmful to their physical and mental health."

"Our policy is backed by Australia's leading drug and medical experts. We are determined to have a policy that works – that actually leads to behaviour change and education and the evidence shows that our policy is working. We refuse to have a policy that is 'name and shame' and which benefits no-one," Mr Demetriou said.

Other changes to the AFL out of competition Illicit Drug Policy include:

- Sanctions now apply on the first and second time a player fails an out of competition illicit drug test. A fine of $5000 applies to the first failed test and a 6 week suspension applies on the second. Both sanctions are suspended and are activated on the third failed test, bringing suspension up to a maximum of 18 weeks.
- Testing has been increased with up to 1500 illicit drug tests to be conducted over a 12-month period.
- Every AFL player will be tested out of competition for illicit drugs at least once a year.
- Greater target testing of players returning to the club out of season will take place from the end of 2008.
- The suspension for a failed third test for marijuana has been increased to a maximum of 12 weeks in line with the other illicit drugs, on the advice of experts of marijuana's increasingly harmful effect on mental health.
- The illicit drugs to be tested for will be expanded to now include Ketamine and GHB, currently not tested by any sport or under the WADA code;
- When a player who has failed a test is traded to, or drafted by, another club, the new Club's Chief Medical Officer is informed of the failed test(s).
- Where multiple failed tests have occurred at a club, the Club's CEO is formally informed of the failed tests but the identity of the Player(s) involved remains confidential.
- A players' failed test will now lapse after a period of four years.

A website (www.aflplayerssaynotodrugs.com.au) has been created detailing information about the AFL's Illicit Drug Policy and the responses from players and experts in the drug prevention field.

AFL Players Association CEO, Brendon Gale, said today that AFL players should be supported for the stand they have taken.

"No other sports people in the country have volunteered for the out-of-competition testing and holiday testing," Mr Gale said.

"Our players are showing great leadership by signing up to this policy, and it is clear that they want to make a difference to ensure that the minority of players who need help receive it."

AFL General Manager of Football Operations, Adrian Anderson, also released the results of the AFL Illicit drug testing for the 12 months to February 2008, saying it demonstrated the AFL's commitment to transparency.

There were 1152 tests in the 12 months to February 2008, resulting in only 1.2 per cent failed tests, – a drop of 35 per cent on 2006 and 70 per cent on the first year of testing in 2005. In 2007 there were 14 failed tests and three players who recorded a second failed test. The majority of failed tests occurred during a blitz of testing players returning to their clubs during post-season.

"The AFL is the only sport to publicly release the results of our testing. The drop in the rate of failed tests despite the significant increase in the number of tests is very pleasing," Mr Anderson said."

"Three years of results shows that taking immediate action in referring players to counselling and treatment is making a difference. After 2000 tests, we now have evidence that our approach is working to change behaviour.

Mr Anderson said advice from the AFL Medical Commissioners that irresponsible use of alcohol was a precursor in almost all failed out of competition illicit drug tests, and that almost half of the failed tests had resulted from increased post-season testing, had accelerated moves to develop a responsible alcohol policy and led to the players agreeing to holiday hair testing.

IDP Testing Breakdown 2005-2007

Year	Total detections	2nd positives	Test numbers	Detection %
2005	19	3	472	**4.03**
2006	9	0	486	**1.85**
2007	14	3	1152	**1.2**
Total	**42**	**6**		

The breakdown of detected substances 2005-2007 by type is as follows:

Year	2005	2006	2007	Total
Cannabinoids	6	0	4	10
Stimulants	12	8	10	30
Mixed	1	1	0	2
Total	**19**	**9**	**14**	**42**

Source: Exclusive to AFL BigPond Network

Further Reading

Websites

Australian Sports Commission: Ethics Unit

- www.ausport.gov.au/ethics/index.asp

Australian Sports Drug Agency

- www.asda.org.au

Canadian Centre for Ethics in Sport

- www.cces.ca

Drugs in Sport

- www.drugsinsport.net

Drug Scope: Drugs in Sport

- www.drugscope.org.uk/wip/7/PDFS/sport.pdf

Genetically Modified Athletes

- www.gmathletes.net

Injury update.com.au

- www.injuryupdate.com.au/index.php

Sports Medicine Australia: Smartplay

- www.smartplay.net/moves/drugs/drugsinfo.html

World Anti-Doping Agency

- www.wada-ama.org/en

- www.aflplayerssaynotodrugs.com.au