ANTI-DOPING TEXTBOOK

UNIVERSIADE GWANGJU 2015

FISU

WORLD ANTI-DOPING AGENCY
play true

REVISED IN SEPTEMBER 2016

FOREWORDS

Since the World Anti-Doping Agency (WADA) was established in 1999 we have collaborated with the Sport Movement and Governments worldwide to promote and coordinate the global harmonised campaign against doping in sport.

One of WADA's roles is to oversee the World Anti-Doping Code. The Code is the set of rules that binds governments and sports to ensure a global approach to the fight against doping. The Code provides the basic framework for WADA's work: "To protect the Athletes' fundamental right to participate in doping-free sport and thus promote health, fairness and equality for Athletes worldwide."

Education is a strategic priority for WADA to prevent doping in sport in the long term, enabled through values-based education programmes. Research has shown that the influence of an athlete's entourage can have a very significant effect on the athlete's attitude towards doping and subsequent behaviour.

It is envisaged that this textbook will help future practitioners and professionals to guide athletes to make the right decisions when it comes to doping and be familiar with all doping related facts and issues.

WADA is delighted to be collaborating on this project with our colleagues in the Gwangju Universiade Organising Committee and the International University Sports Federation (FISU). They have shown tremendous initiative in the fight against doping by including this project as part of the Gwangju Legacy Programme.

"I encourage all university students who use this resource to be leaders in protecting clean sport by educating your peers, students and athletes through your professional care."

JOHN FAHEY AC
WADA President
(November 2007-November 2013)

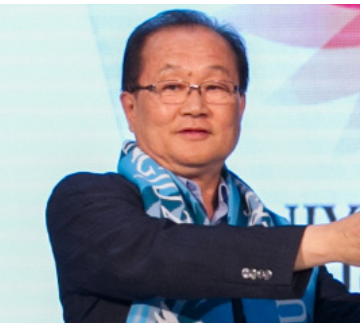
The International University Sports Federation (FISU), which is responsible for the organisation and governance of worldwide competitions for student-athletes between the ages of 17 and 28, is committed to safe and fair sport competition among university student athletes throughout the world.

FISU fully supports the process of producing an e-textbook and setting up an information and prevention programme in relation to doping for university students. A federation such as ours indeed considers that the need to educate and inform should always prevail over the sanction.

Education and information are indeed the only means that enable athletes in all disciplines, as well as their support personnel, to realise the seriousness of practices that have become, from an early age, commonplace not only in the various sports communities, whether they be related to competition or leisure, but also in business, a sector too often led by the cult of achievement.

Simply say no to doping, you'll get much from it!

OLEG MATYTSIN
FISU President



The 2015 Gwangju Summer Universiade Organizing Committee (GUOC 2015) has established a comprehensive Legacy Programme to ensure the hosting of the 2015 Summer Universiade has a positive social impact on society.

An expectation of any city hosting a major sporting event is to leave a lasting legacy in terms of economic, social, and environmental impact on its community, country or even, to a certain extent, the globe. The legacy programme often receives less attention than the actual competitions; however, GUOC 2015 wishes to pay particular attention in promoting how its legacy programme will have a social impact beyond the sport competition.

Gwangju's Legacy Programme is designed to uphold the values of the Federation Internationale du Sport Universitaire (FISU) and inspire the spirit of the Universiade as well as create a sustainable legacy for developing sport across the universities of the world.

The GUOC 2015 Legacy Programme includes the following four projects:

- This anti-doping textbook for universities (in collaboration with the World Anti-Doping Agency and FISU)
- Formation of United North and South Korean Team for the 2015 Summer Universiade
- Young Reporters Programme (YRP)
- Mentoring programme for young women leaders

GUOC 2015 initiated the development of an anti-doping e-textbook to foster a doping free environment, in close collaboration with the World Anti-Doping Agency (WADA) and FISU. The goal was to raise social awareness through this, the first of its kind, comprehensive material targeted at university students around the world. The textbook will help students become more aware of the harm of doping – information that they will eventually pass on to future generations thereby enhancing the physical and mental health of youth.

KIM, YOONSUK
Secretary General 2015 Gwangju Summer Universiade Organizing Committee

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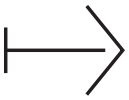

The Universiade is an international sporting and cultural festival that is staged every two years in a different city. The International University Sports Federation (FISU) is responsible for supervising all summer and winter Universiades as well as World University Championships. Gwangju, Korea, is host of the 2015 Summer Universiade.

In addition to legacies directly related to the sporting event, including facilities and the Athletes' Village, the 2015 Gwangju Summer Universiade has initiated a social legacy programme that can contribute to improving quality of life, developing technical and social skills, cultivating a culture of wellness (especially for young adults), enhancing FISU values and further developing the Universiade.

It is within this context that Gwangju Universiade Organising Committee initiated the creation of this e-textbook and supporting material in cooperation with FISU and the World Anti-Doping Agency (WADA) to distribute to universities worldwide.

On 15 November 2013, the sports movement and governments of the world renewed their joint commitment to the fight against doping in Johannesburg by adopting a resolution and approving the 2015 World Anti-Doping Code (Code) and accompanying International Standards (IS). The 2015 Code came into effect on 1 January 2015. The content of this textbook is based on the 2015 Code. Please refer back to antidopinglearninghub.org to ensure that you always have the most up to date version of the textbook.

ABBREVIATIONS

A number of abbreviations are used throughout this textbook. Below is an overview of these terms.

AAF	Adverse Analytical Finding
ABP	Athlete Biological Passport
ADAMS	Anti-Doping Administration & Management System
ADO	Anti-Doping Organisation
ADRV	Anti-Doping Rule Violation
APMU	Athlete Passport Management Unit
ASADA	Australian Sport Anti-Doping Agency
CAS	Court for Arbitration in Sport
CCES	Canadian Centre for Ethics in Sport
Code	World Anti-Doping Code
Convention	UNESCO Convention against Doping in Sport
DCO	Doping Control Officer
EPO	Erythropoietin
FIFA	International Federation of Association Football
FISU	International University Sports Federation
hGH	human Growth Hormone
IAAF	International Athletics Associations Federation
IF	International Sport Federation
IOC	International Olympic Committee
IPC	International Paralympic Committee
IRTP	International Registered Testing Pool
ISL	International Standard for Laboratories
ISPPPI	International Standard for the Protection of Privacy and Personal Information
ISTI	International Standard for Testing and Investigations
ISTUE	International Standard for Therapeutic Use Exemptions
List	Prohibited List or List of Prohibited Substances and Methods
LOC	Local Organising Committee
NADO	National Anti-Doping Organisation
NOC	National Olympic Committee
NPC	National Paralympic Committee
NRTP	National Registered Testing Pool
RADO	Regional Anti-Doping Organisation
RTP	Registered Testing Pool
TUE	Therapeutic Use Exemption
TUEC	Therapeutic Use Exemption Committee
UCI	International Cycling Union
UKAD	United Kingdom Anti-Doping
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USADA	United States Anti-Doping Agency
WADA	World Anti-Doping Agency


UNIT
01
UNIT
01 WHAT IS
DOPING?

Definition of Doping

It is commonly believed that doping is simply the use of a prohibited substance, but breaking other anti-doping rules is also considered doping. In the World Anti-Doping Code (Code), the core document that provides the framework for harmonized anti-doping policies, rules and regulations within sport organisations and among public authorities, doping is defined as breaking one or more anti-doping rules. Within the sport community, this is referred to as an anti-doping rule violation (ADRV).

The Code outlines the following ADRVs:

ARTICLE 2.1 Presence of a prohibited substance or its metabolites or markers in an athlete's sample

ARTICLE 2.2 Use or attempted use by an athlete of a prohibited substance or a prohibited method

ARTICLE 2.3 Evading, refusing or failing to submit to sample collection

ARTICLE 2.4 Whereabouts Failure - Any combination of three missed tests and / or filing failures, as defined in the International Standard for Testing and Investigations, within a twelve-month period by an athlete in a registered testing pool

ARTICLE 2.5 Tampering or attempted tampering with any part of doping control

ARTICLE 2.6 Possession of prohibited substances and prohibited methods

ARTICLE 2.7 Trafficking or attempted trafficking in any prohibited substance or prohibited method

ARTICLE 2.8 Administration or attempted administration to any athlete in-competition of any prohibited method or prohibited substance, or administration or attempted administration to any athlete out-of-competition of any prohibited method or any prohibited substance that is prohibited out-of-competition

ARTICLE 2.9 Complicity - Assisting, encouraging, aiding, abetting, conspiring, covering up or any other type of intentional complicity involving an anti-doping rule violation, attempted anti-doping rule violation or violation of Article 10.12.1 by another person.

ARTICLE 2.10 Prohibited association, that is, association by an athlete or other person subject to the authority of an Anti-Doping Organisation in a professional or sport-related capacity with any athlete support person who has committed an ADRV, whether that be the possession, administration or trafficking of a prohibited substance, or another ADRV identified in the Code

Presence and Use of a Prohibited Substance:

Athletes are responsible for everything that enters their body. It is not necessary that intent, fault, negligence or knowing use on the athlete's part be demonstrated in order to establish an ADRV. This is referred to as the notion of strict liability, which had been applied by the International Olympic Committee (IOC) in its Anti-Doping Code as well as by the vast majority of pre-Code anti-doping sports rules.
(See *Strict Liability*, page 18)

While proof, through laboratory analysis of a bodily sample, is required to establish an ADRV under Article 2.1 of the Code, any 'reliable means' is sufficient for establishing an ADRV under Article 2.2. This may include an athlete admission, witness statements, or conclusions drawn from longitudinal profiling
(See *Athlete Biological Passport*, page 39)

Evading, Refusing / Failing to Submit and Tampering:

Evading sample collection or refusing or failing to provide a sample after being notified that he/she has been selected for doping control is an anti-doping rule violation that carries the same sanction as presence or use of a prohibited substance would. This means athletes cannot avoid providing a sample by saying they are not available or do not have time. Similarly, it would be an anti-doping rule violation if it were established that an athlete was hiding from doping control officials to avoid being notified or tested. An athlete who agrees to provide a sample but who tampers with or attempts to tamper with the doping control equipment or any other part of the process is also considered to be committing an anti-doping rule violation.

Not Providing Whereabouts Information:

Athletes in a Registered Testing Pool (RTP) **(See *Registered Testing Pool (RTP)*, page 108)** are required to inform Anti-Doping Organisations (ADOs) where they will be and when. This is referred to as the Athlete Whereabouts Programme **(See *Whereabouts*, page 48)**. An ADO can test an athlete at home, at his/her training centre or at a competition. If athletes do not provide this information or are not where they say they will be three times within a 12-month period, the athlete can be charged with an ADRV and sanctioned accordingly.

ADDITIONAL READING

Laure P.
Dopage et Société
L'Eurobiologiste
2000

Possession and Trafficking:

Possession, trafficking or attempted trafficking of a prohibited substance is an ADRV. This applies to athletes as well as athlete support personnel (e.g. coach, physician). An ADRV would not be established in the case where athletes or support personnel have in their possession a prohibited substance for which the athlete has been granted a Therapeutic Use Exemption (TUE).

Complicity

Any person or organisation would be in violation of the anti-doping rules if they are found to be assisting, encouraging, aiding, abetting, conspiring, covering up or any other type of intentional complicity involving an anti-doping rule violation, attempted anti-doping rule violation or violation of Article 10.12.1 (Prohibition against participation during ineligibility).

Prohibited Association

An ADRV will be considered for an athlete who is associated with an athlete support personnel who is serving a period of ineligibility, or who has been convicted in a criminal, disciplinary or professional proceeding for conduct that would constitute doping, such as a coach under suspension for an ADRV. Association includes activities such as obtaining training, strategy, technique, nutrition or medical advice; obtaining therapy, treatment or prescriptions; providing any bodily products for analysis; or allowing the athlete support personnel to serve as an agent or representative. This article does not apply in circumstances where the association is unavoidable, such as a child/parent or wife/husband relationship. Before an athlete is found to have violated this article, the athlete must receive notice from the appropriate ADO of the athlete support personnel's disqualified status and the consequences of continued association.

History of Doping and Anti-Doping

The word doping is believed to be derived from the Dutch word 'dop', the name of an alcoholic beverage made of grape skins used by Zulu warriors in order to enhance their prowess in battle. The term became current around the turn of the 20th century, originally referring to illegal drugging of racehorses. The practice of enhancing performance through foreign substances or other artificial means, however, is as old as competitive sport itself.

Early Years of Doping

Ancient Greek athletes are known to have used special diets and stimulating potions to fortify themselves. Strychnine, caffeine, cocaine, and alcohol were often used by cyclists and other endurance athletes in the 19th century. Thomas Hicks ran to victory in the marathon at the 1904 Olympic Games, in Saint Louis, with the help of raw egg, injections of strychnine and doses of brandy administered to him during the race.

By the 1920s it had become evident that restrictions regarding drug use in sports were necessary.

First Attempts

In 1928, the IAAF (athletics) became the first International Sport Federation (IF) to ban doping (use of stimulating substances). Many other IFs followed suit, but restrictions remained ineffective as no tests were performed. Meanwhile the problem was made worse by synthetic hormones, invented in the 1930s and in growing use for doping purposes since the 1950s. The death of Danish cyclist Knud Enemark Jensen during competition at the Olympic Games in Rome 1960 (the autopsy revealed traces of amphetamine) increased the pressure for sports authorities to introduce drug testing.

In 1966 UCI (cycling) and FIFA (football) were among the first IFs to introduce doping tests in their respective World Championships. In the next year the International Olympic Committee (IOC) instituted its Medical Commission and set up its first list of prohibited substances. Drug tests were first introduced at the Olympic Winter Games in Grenoble and at the Olympic Games in Mexico in 1968. In the year before, the urgency of anti-doping work had been highlighted by another tragic death, that of cyclist Tom Simpson during the Tour de France.

Tests Begin to Work

Most IFs introduced drug testing by the 1970s; however, the use of anabolic steroids was becoming widespread, especially in strength events, as there was no way of detecting them yet. A reliable testing method was finally introduced in 1974, and the IOC added anabolic steroids to its list of prohibited substances in 1976. This resulted in a marked increase in the number of doping-related disqualifications in the late 1970s, notably in strength-related sports such as throwing events and weightlifting.

Anti-doping work was complicated in the 1970s and 1980s by suspicions of state-sponsored doping practices in some countries, which were substantiated by the former German Democratic Republic. Archival material and athlete testimonials indicated that anywhere from tens to hundreds of thousands of athletes were given steroids without their knowledge, resulting in severe health consequences.

The most famous doping case of the 1980s concerned Ben Johnson, the 100-metre champion who tested positive for Stanozolol (an anabolic steroid) at the 1988 Olympic Games in Seoul. Johnson's case focused the world's attention on the problem of doping to an unprecedented degree.

New Challenges

While the fight against stimulants and steroids was producing results, the main front in the anti-doping war was rapidly shifting to blood doping. 'Blood boosting,' removal and subsequent re-infusion of the athlete's blood in order to increase the level of oxygen-carrying haemoglobin, has been practiced since the 1970s. The IOC banned blood doping as a method in 1986.

Blood doping can include athletes removing their blood and then reintroducing it into their body or using erythropoietin (EPO) to increase haemoglobin levels. EPO was included in the IOC's list of prohibited substances in 1990. An effective test for detecting EPO was first implemented at the Olympic Games in Sydney in 2000. Since then, newer erythropoietic agents as well as more sophisticated detection methods have come into existence.

Although prohibited by the IOC in 1989, a test for human Growth Hormone (hGH) was not approved until 2004. The test continued to be refined, with a new test introduced prior to the London 2012 Olympic Games, which provides the anti-doping community with a longer detection window.

In February 2010, the UK National Anti-Doping Organisation (UK Anti-Doping) announced the first completed case involving an analytical finding for hGH. The first hGH adverse analytical finding and sanction in North America was reported in September 2010 by the Canadian Centre for Ethics in Sport (CCES). Two Russian powerlifters were also sanctioned during the London 2012 Paralympic Games.

Another landmark case was the use of designer steroids with athletes in the BALCO affair. Victor Conte supplied a number of US athletes including Marion Jones, C.J. Hunter and Tim Montgomery with a designer steroid called 'the clear.' Not only were

athletes sanctioned as a result of the investigation, but some were also prosecuted and even imprisoned.

Future Challenges – Gene Doping

Current medical research promises that the treatment of complex diseases will soon be made easier thanks to gene therapy. In the sports world, however, it has been reported that some athletes have already inquired into the possibility of using gene therapy to improve athletic performance. Given that the World Anti-Doping Agency (WADA) studies emerging threats, in March 2002, a workshop on gene doping was organised by WADA at the Banbury Center in New York. Experts, scientists, ethicists, athletes, governments and representatives from the Olympic Movement studied the issue and concluded that there is a high likelihood that this technique will be used for doping in the near future. As a result, gene doping was included on the 2003 Prohibited List of Substances and Methods and is defined as the non-therapeutic use of cells, genes, genetic elements, or of the modulation of gene expression, having the capacity to enhance athletic performance. WADA also created in 2004 a panel of experts on gene doping. The panel's task is to study the latest advances in the field of gene therapy, and the methods for detecting doping, as well as to discuss the outcome of the research projects funded by WADA in this area. The Agency held a second gene doping symposium in December 2005 in Stockholm, a third in St-Petersburg in 2008 and a fourth in Beijing in 2013 hosted by the Chinese National Anti-Doping Agency (CHINADA). The WADA Gene Doping Expert Group continues to meet regularly.

United Efforts

In 1998, a large number of prohibited medical substances were found by police in a raid during the Tour de France. The scandal led to a major reappraisal of the role of public authorities in anti-doping affairs. As early as 1963, France had been the first country to enact anti-doping legislation. Other countries followed suit, but international cooperation in anti-doping affairs was long restricted to the Council of Europe. In the 1980s, there was a marked increase in cooperation between international sports authorities and various governmental agencies. Before 1998, debate was still taking place in several discrete forums (IOC, Sports Federations, individual governments), resulting in differing definitions, policies, and sanctions. One result of this confusion was that doping sanctions were often disputed and sometimes overruled in civil courts.

The Tour de France scandal highlighted the need for an independent international agency, which would set unified standards for anti-doping work and coordinate the efforts of sports organisations and public authorities. The IOC took the initiative and convened the First World Conference on Doping in Sport (World Conference) in Lausanne in February 1999.

Creation of WADA

This First World Conference on Doping in Sport produced the Lausanne Declaration on Doping in Sport (Lausanne Declaration) providing for the creation of an independent international anti-doping agency to be operational for the Games of the XXVII Olympiad in Sydney in 2000. **(See *Lausanne Declaration*, page 19)**

Pursuant to the terms of the Lausanne Declaration, the World Anti-Doping Agency (WADA) was established on 10 November 1999, in Lausanne, to promote and coordinate the fight against doping in sport internationally. WADA was set up as a foundation under the initiative of the IOC with the support and participation of intergovernmental organisations, governments, public authorities, and other public and private bodies fighting doping in sport.

The Agency is governed by a 36-member Foundation Board and a 12-member Executive Committee, each composed of equal numbers of representatives from the Olympic Movement and from governments.

WADA is responsible for:

- publishing the World Anti-Doping Code (Code) and monitoring its acceptance and compliance by sports governing bodies
- fostering the provision of education and of doping prevention information for athletes, coaches, youth and other relevant target groups
- providing certain funds for and managing scientific research and social science research programmes aimed at developing new detection methods and improving doping prevention
- observing doping control and results management programmes at major events
- fostering the worldwide development of national or regional anti-doping programmes

WADA is not responsible for:

- performing analyses on urine or blood samples. (These analyses are performed in laboratories that have been accredited by WADA to do so.)
- sanctioning for anti-doping rule violations (ADRVs). (Sanctions are imposed by the governing body of the person who violated the doping rules. These governing bodies can be Anti-Doping Organisations (ADOs), event organisers, or sports federations, according to whether they operate at the international or national level.)

SUPPLEMENTARY INFORMATION

Strict Liability

For purposes of anti-doping rule violations (ADRVs) involving the presence of a prohibited substance **(See *Definition of Doping*, page 11)**, the World Anti-Doping Code (Code) adopts the rule of strict liability. The notion of strict liability was found in the Olympic Movement Anti-Doping Code – the anti-doping rules governing the Olympic Movement prior to the creation of WADA in 1999 and the adoption of the first version of the Code in 2004 - and the vast majority of pre-Code anti-doping rules.

Under the strict liability principle, athletes are responsible for any prohibited substance that is found in their body. A potential ADRV will occur without regard to their intention or to their level of precaution. If the positive sample came from an in-competition test, the results of that competition are automatically invalidated (Article 9 of the Code - Automatic Disqualification of Individual Results). However, the athlete then has the possibility to avoid (Article 10.4 - Elimination of the Period of Ineligibility where there is no Fault or Negligence) or reduce (Article 10.5 Reduction of the Period of Ineligibility based on no Significant Fault or Negligence) sanctions if the athlete can demonstrate that he or she was not at fault or significant fault.

The strict liability rule for the finding of a prohibited substance in an athlete's sample allows for the possibility that sanctions may be modified based on specified criteria. This provides a reasonable balance between effective anti-doping enforcement for the benefit of all 'clean' athletes and fairness in the exceptional circumstance where a prohibited substance entered an athlete's system through no fault or negligence or no significant fault or negligence on the athlete's part. It is important to emphasize that while the determination of whether the ADRV has occurred is based on strict liability, the imposition of a fixed period of ineligibility is not automatic. The strict liability principle set forth in the Code has been consistently upheld in the decisions of the Court of Arbitration for Sport (CAS).

Lausanne Declaration on Doping in Sport

Adopted by the World Conference on Doping in Sport 4 February 1999, Lausanne, Switzerland

Considering that doping practices contravene sport and medical ethics, and that they constitute violations of the rules established by the Olympic Movement, and concerned by the threat that doping poses to the health of athletes and youth in general;

Recognizing that the fight against doping in sport is the concern of all: the Olympic Movement and other sports organisations, governments, inter-governmental and non-governmental organisations, sportsmen and sportswomen throughout the world, and their entourage;

The World Conference on Doping in Sport, with the participation of representatives of governments, of inter-governmental and non-governmental organisations, of the International Olympic Committee (IOC), the International sports Federations (IFs), the National Olympic Committees (NOCs), and of the athletes, declares:

1. Education, Prevention and Athletes' Rights

The The Olympic oath shall be extended to coaches and other officials, and shall include the respect of integrity, ethics and fair play in sport. Educational and preventive campaigns will be intensified, focusing principally on youth, and athletes and their entourage. Complete transparency shall be assured in all activities to fight doping, except for preserving the confidentiality necessary to protect the fundamental rights of athletes. Partnership with the media shall be sought in anti-doping campaigns.

2. Olympic Movement Anti-Doping Code

The Olympic Movement Anti-Doping Code is accepted as the basis for the fight against doping, which is defined as the use of an artifice, whether substance or method, potentially dangerous to athletes' health and/or capable of enhancing their performances, or the presence in the athlete's body of a substance, or the ascertainment of the use of a method on the list annexed to the Olympic Movement Anti-Doping Code.

The Olympic Movement Anti-Doping Code applies to all athletes, coaches, instructors, officials, and to all medical and paramedical staff working with athletes or treating athletes participating in or training for sports competitions organized within the framework of the Olympic Movement.

3. Sanctions

The sanctions which apply to doping violations will be imposed in the framework of controls both during and out of competition.

In accordance with the wishes of the athletes, the NOCs and a large majority of the IFs, the minimum required sanction for major doping substances or prohibited methods shall be a suspension of the athlete from all competition for a period of two years, for a first offence. However, based on specific, exceptional circumstances to be evaluated in the first instance by the competent IF bodies, there may be a provision for a possible modification of the two-year sanction. Additional sanctions or measures may be applied. More severe sanctions shall apply to coaches and officials guilty of violations of the Olympic Movement Anti-Doping Code.

4. International Anti-Doping Agency

An independent International Anti-Doping Agency shall be established so as to be fully operational for the Games of the XXVII Olympiad in Sydney in 2000. This institution will have as its mandate, notably, to coordinate the various programmes necessary to realize the objectives that shall be defined jointly by all the parties concerned. Among these programmes, consideration should be given in particular to expanding out-of-competition testing, coordinating research, promoting preventive and educational actions and harmonizing scientific and technical standards and procedures for analyses and equipment. A working group representing the Olympic Movement, including the athletes, as well as the governments and inter-governmental organisations concerned, will meet, on the initiative of the IOC, within three months, to define the structure, mission and financing of the Agency. The Olympic Movement commits to allocate a capital of US $25 million to the Agency.

5. Responsibilities of the IOC, the IFs, the NOCs and the CAS

The IOC, the IFs and the NOCs will maintain their respective competence and responsibility to apply doping rules in accordance with their own procedures, and in cooperation with the International Anti-Doping Agency. Consequently, decisions handed down in the first instance will be under the exclusive responsibility of the IFs, the NOCs or, during the Olympic Games, the IOC. With regard to last instance appeals, the IOC, the IFs and the NOCs recognize the authority of the Court of Arbitration for Sport (CAS), after their own procedures have been exhausted.

In order to protect athletes and their rights in the area of disciplinary procedure, the general principles of law, such as the right to a hearing, the right to legal assistance, and the right to present evidence and call witnesses, will be confirmed and incorporated into all applicable procedures.

6. Collaboration between the Olympic Movement and public authorities

The collaboration in the fight against doping between sports organisations and public authorities shall be reinforced according to the responsibilities of each party. Together, they will also take action in the areas of education, scientific research, social and health measures to protect athletes, and coordination of legislation relative to doping.

In accordance with the wishes of the athletes, the NOCs and a large majority of the IFs, the minimum required sanction for major doping substances or prohibited methods shall be a suspension of the athlete from all competition for a period of two years, for a first offence. However, based on specific, exceptional circumstances to be evaluated in the first instance by the competent IF bodies, there may be a provision for a possible modification of the two-year sanction. Additional sanctions or measures may be applied. More severe sanctions shall apply to coaches and officials guilty of violations of the Olympic Movement Anti-Doping Code.

Done in Lausanne (Switzerland), 4 February 1999

UNIT 02 THE FIGHT AGAINST DOPING IN SPORT

UNIT
02

Who's Who in Anti-Doping

There are two significant advances contained in the World Anti-Doping Code (Code) in the global fight against doping; they are the formalization of certain rules, and the clarification and organisation of stakeholder responsibilities, thus bringing harmonisation to a system where previously rules varied, or in some cases did not exist.

A broad overview of the various players in the fight against doping in sport is provided in this section. As custodian of the Code, the World Anti-Doping Agency (WADA) has the duty to monitor stakeholder activities in relation to the Code and to act to ensure the integrity of the Code.

The objective is for athletes worldwide to benefit from the same anti-doping protocols and protections, no matter the sport, nationality or country where tested.

International Fight against Doping in Sport

WADA & the Code

WADA is the international, independent organisation, recognized by public authorities and the Olympic Movement, monitoring the global fight against doping in sport and the custodian of the World Anti-Doping Code (Code). WADA oversees and works in cooperation with a network of stakeholders, each of which has its own specific set of roles and responsibilities.

The Code is a set of rules, which establishes the fundamental principles on which all efficient anti-doping policies should be based, for adoption and implementation by sports governing bodies. It includes the Prohibited List and other International Standards for testing and investigations, Therapeutic Use Exemptions (TUEs), laboratory procedures and privacy protection.
(See *World Anti-Doping Code*, page 27)

UNESCO & the Convention

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) is responsible for the development and implementation, alongside national governments, of the International Convention against Doping in Sport (Convention). Many governments cannot be legally bound by a non-governmental document such as the Code. Governments accordingly drafted and adopted the Convention to align their domestic policies with the Code. This first universal treaty against doping in sport entered into force in February 2007. Governments are now ratifying it individually.

IOC, IPC and IFs

The International Olympic Committee (IOC) and the International Paralympic Committee (IPC) are responsible for the testing process, based on the Code, during the Olympic and Paralympic Games respectively, as well as sanctioning those who commit ADRVs during the Games. The IOC, on behalf of the sports movement, provides half of WADA's budget.

To be compliant with the Code, International Sports Federations (IFs), as well as all other sports organisations, must undertake three steps:

1. Code acceptance
2. Implementation
3. Enforcement

Code acceptance means that the IF agrees to the tenets of the Code. Implementation means that following Code acceptance, the IF has amended its rules and policies to include the Code's mandatory articles and principles. Finally, Code enforcement means that the IF has amended its rules and policies and is enforcing them in accordance with the Code. Activities required of IFs by the Code include conducting testing at their competitions, having education and out-of-competition testing programmes, and sanctioning those who commit anti-doping rule violations, as outlined in the Code.

CAS

The Court of Arbitration for Sport (CAS) is an institution independent of any sport organisation that provides services to facilitate the settlement of sport-related disputes, through arbitration or mediation, by means of procedural rules adapted to the specific needs of the sport world. CAS is often referred to as 'sport's supreme court'. WADA has a right of appeal to CAS for doping cases under the jurisdiction of organisations that have implemented the Code.

Other Major Event Organisers

As governing bodies for major sporting events, such as continental games and international multi-sport events, Major Event Organisers are expected to implement anti-doping programmes in line with the Code. While these organisations may not be responsible for the actual sample collection, they have jurisdiction over their event and are responsible for having Code-compliant anti-doping rules and policies, including establishing test distribution plans, instead of having National Anti-Doping Organisations (NADOs) or Regional Anti-Doping Organisations (RADOs) take on sample collection responsibilities. In addition, Major Event Organisers are responsible for results management of potential ADRVs at their event, including potential sanctions relating to the event. Examples of such Major Event Organisers include the Commonwealth Games Foundation (CGF), the International World Games Association (IWGA), the International University Sports Federation (FISU) and continental associations such as the Pan American Sports Organisation (PASO), the Association of National Olympic Committees of Africa (ANOCA), the European Olympic Committees (EOC), the Oceania National Olympic Committees (ONOC) and the Olympic Council of Asia (OCA).

WADA Accredited Laboratories

Laboratories that are able to analyse doping control samples under the Code must achieve and maintain accreditation from WADA, according to the criteria established in the International Standard for Laboratories (ISL) and its related technical documents. The laboratories must also meet the standards established for the production of valid test results and evidentiary data. In consideration that the current network of WADA accredited laboratories may be geographically limited to fully serve the practical development of the "Athlete Biological Passport" in particular, for some regions of the world, WADA has developed an approval process and criteria for non-WADA accredited laboratories to analyse blood variables exclusively for the ABP. This will permit them to join the network of accredited laboratories under provision 6.1 ('Use of Approved Laboratories') of the Code.

National Fight against Doping in Sport

National and Regional Anti-Doping Organisations

National Anti-Doping Organisations (NADOs) are responsible for testing national athletes in- and out-of-competition, as well as athletes from other countries competing within that nation's borders; adjudicating ADRVs; and anti-doping education.

WADA works with stakeholders in areas of the world where there are limited or no anti-doping activities to pool resources and develop Regional Anti-Doping Organisations (RADOs), responsible for anti-doping in its respective grouping of neighbouring countries. RADOs fulfil a similar role to that of a NADO for their member countries.

Governments

Government responsibilities in anti-doping are many:

- they facilitate doping control and support national testing programmes
- encourage the establishment of 'best practice' in the labelling, marketing, and distribution of products that might contain prohibited substances
- withhold financial support from those who engage in or support doping
- take measures against manufacturing and trafficking
- encourage the establishment of codes of conduct for professions relating to sport and anti-doping, and
- fund anti-doping education and research

National governments are also responsible for ratifying, accepting, approving or acceding to the UNESCO Convention and implementing it on their territory. Governments are expected to pay their share of dues to WADA, representing 50% of its total funding.

NOCs, NPCs, NFs

IOC and IPC rules require that National Olympic Committees (NOCs) and National Paralympic Committees (NPCs) agree to implement the Code. In the absence of a NADO, the NOC must fulfil the role of a NADO in its country. In addition, according to the Code, IF rules should include the requirement that National Federations (NFs) be Code-compliant, and that these rules are enforced. Each may act as an intermediary between athletes and their IF and/or NADO on anti-doping matters.

World Anti-Doping Code

One of the most significant achievements in the fight against doping in sport to date has been the drafting, acceptance and implementation of a harmonised set of anti-doping rules, the World Anti-Doping Code (Code).

The Code is the core document that provides the framework for harmonised anti-doping policies, rules and regulations within sport organisations and among public authorities. It works in conjunction with five International Standards aimed at bringing harmonisation among anti-doping organisations in various areas: testing and investigations, laboratories, Therapeutic Use Exemptions (TUEs), the List of Prohibited Substances and Methods, and the protection of privacy and personal information.
(See *International Standards*, page 32)

This harmonisation works to address the problems that previously arose from disjointed and uncoordinated anti-doping efforts, such as among others, a scarcity and splintering of resources necessary to conduct research and testing, a lack of knowledge about specific substances and procedures being used and to what degree, and an uneven approach to penalties for athletes found guilty of doping.

Implementation of the Code

Code Signatories must ensure that their own anti-doping rules and policies are in compliance with the mandatory articles and other principles of the Code. WADA assists signatories by reviewing their anti-doping rules to ensure that they are Code-compliant, and where this is not the case, by offering assistance to remedy the situation.

Code Monitoring

WADA closely monitors doping cases and has the right to appeal to the Court of Arbitration for Sport (CAS) cases under the jurisdiction of organisations who have implemented the Code.

WADA also has powers of intervention in ensuring that TUEs are consistently granted. WADA's role in the TUE process is two-pronged: the Agency reserves the right to monitor and review any TUE granted by a federation or anti-doping agency; as well, athletes who have requested a TUE and were denied can ask WADA to review that decision. If WADA determines that a denial of the TUE did not comply with the International Standard, the Agency can reverse the decision.

In addition, as the guardian of the Code, WADA is required to formally report on stakeholder compliance with the Code (Code Article 23.5.4).

WADA reports cases of non-compliance to its stakeholders who have jurisdiction to impose sanctions, including the International Olympic Committee (IOC). The Olympic charter was amended in 2003 to state that adoption of the Code by the Olympic Movement is mandatory. Only sports that adopt and implement the Code can be included and remain in the programme of the Olympic Games.

If a country does not ratify the UNESCO International Convention against Doping in Sport (Convention), it may be subject to sanctions from the IOC and from other sport organisations, including losing the right to host Olympic Games.

Advances

Since it entered into force on 1 January 2004, the Code has proven to be a very powerful and effective tool in the harmonisation of anti-doping efforts worldwide. This has been demonstrated by the overwhelming support of governments and sports in accepting the Code, in addition to the growing body of jurisprudence from the CAS in supporting the Code's tenets.

The adoption of the Code led to several significant advances in the global fight against doping in sport, including the formalisation of certain rules as well as the clarification of stakeholder responsibilities. This brought about harmonisation to a system where previously rules had varied and, in some cases, did not exist.

Additionally, the Code introduced the concept of 'non-analytical' rule violations, meaning that a sanction can be applied in cases where there is evidence that an anti-doping rule violation (ADRV) occurred but where there is no positive doping control test.
(See Definition of Doping, page 11)

2009 Code

Building on the experience gained in the application of the Code and with the goal of enhancing anti-doping programmes worldwide, WADA initiated a consultation process in 2006, for the practical review and fine-tuning of the Code's provisions. Throughout the revision process, WADA encouraged comments and suggestions from both its stakeholders and all those who want clean and fair sport, which would benefit the global community of athletes.

Following an open and transparent consultation process that included three phases and the publication of several preliminary drafts, the revised Code was unanimously adopted by WADA's Foundation Board and endorsed by the 1,500 delegates present on 17 November 2007, the final day of the Third World Conference on Doping in Sport, in Madrid, Spain. The revisions to the Code took effect on 1 January 2009.

The Code review process resulted in an even stronger, more robust tool to ensure that all athletes benefit from the same anti-doping procedures and protections, no matter the sport, the nationality, or the country where tested, so that in the end, athletes may participate in competition that is safe and fair.

Code Consultation Process & 2015 Code

Just as the 2004 and 2009 Codes addressed the issues of their time, the 2015 Code responded to current challenges, while continuing to provide strong, simple and fair solutions that unite all members of the anti-doping community in their vision toward tackling the scourge of doping and protecting the rights of the clean athletes.

WADA initiated a Code consultation process similar to that used in its development for the 2009 Code. This allowed for a practical review of the Code's provisions and some fine-tuning to enhance anti-doping programmes. The consultation provided stakeholders with the opportunity to contribute constructively to the improvement of the Code.

WADA maintained a collaborative approach throughout the 2015 Code Review Process to ensure that the resulting Code would be a Code that belonged to everyone; it would be seen as the world's anti-doping code. While anyone with an interest in the Code could make a submission, the majority came from sport (including athletes), the anti-doping community, government, law, medicine, science, and academia. Of the nearly 3986 changes submitted, 2000-plus were pursued.

Copenhagen Declaration & UNESCO Convention

Many governments cannot be legally bound by a non-governmental document such as the World Anti-Doping Code (Code). Accordingly, governments prepared the Copenhagen Declaration on Anti-Doping in Sport (Copenhagen Declaration), which was finalized in 2003. Pursuant to the Code, governments subsequently drafted an international convention under the auspices of UNESCO, the United Nations body responsible for education, science, and culture, to allow formal acceptance of the World Anti-Doping Agency (WADA) and the Code.

Copenhagen Declaration

The Copenhagen Declaration was drafted and agreed to by governments at the Second World Conference on Doping in Sport held in Copenhagen, Denmark, in March 2003.

The Copenhagen Declaration was the political document through which governments signalled their support to WADA, as well as their intention to formally recognize and implement the Code (World Anti-Doping Agency, 2003).

This initiative was the first step taken by governments towards the preparation of the UNESCO International Convention against Doping in Sport (Convention).

UNESCO Convention

The UNESCO International Convention against Doping in Sport (Convention) is the first global treaty against doping in sport. It was adopted unanimously by the 33rd UNESCO General Conference on 19 October 2005, and went into force on 1 February 2007, following the 30th ratification.

Why UNESCO? As mentioned, many governments could not be legally bound by the Code, since it is a non-governmental document. Therefore, governments agreed that an international convention was needed. The aim of UNESCO is to contribute to peace

and security by promoting collaboration among nations through education, science and culture. In November 2003, the UN General Assembly adopted a resolution concerning sport as a means to promote education, health, development and peace.

The Convention outlines the concern that doping in sport has consequences on athlete health, the principle of fair play, the influence that elite athletes have on youth, and therefore the future of sport. Furthermore, doping puts at risk the ethical principles and educational values embodied in the International Charter of Physical Education and Sport of UNESCO and in the Olympic Charter. It recognizes the importance of education in preventing doping.

The Convention provides recognition of the role that State Parties and public authorities have in implementing anti-doping programmes. This includes the ongoing need to conduct and promote research with the objectives of improving detection of doping, enhancing understanding of the factors affecting use in order for prevention strategies to be most effective, as well as recognising that these authorities and organisations must work together for these purposes, ensuring the highest degree of independence and transparency at all appropriate levels. The elimination of doping in sport is dependent in part upon progressive harmonisation of anti-doping standards and practices in sport and cooperation at the national and global levels.

Like all International Conventions, the Convention against Doping in Sport requires ratification, acceptance or accession by States. The Convention defines rules with which the States undertake to comply. The Convention therefore allows governments to align their domestic legislation with the Code and thereby continue to harmonise sport and public legislation in the fight against doping in sport.

List of Countries that have Ratified the Convention:
http://www.wada-ama.org/en/Anti-Doping-Community/Governments/UNESCO-International-Convention-against-Doping-in-Sport/Ratifications/

International Standards

International Standards for different technical and operational areas within the anti-doping programme have been developed in consultation with the Signatories and approved by the World Anti-Doping Agency (WADA). These are:

- the Prohibited List
- Testing and Investigations
- Laboratories
- Therapeutic Use Exemptions (TUEs)
- Protection of Privacy and Personal Information

The purpose of the International Standards is harmonisation among anti-doping organisations responsible for specific technical and operational parts of the anti-doping programmes. Adherence to the International Standards is mandatory for compliance with the World Anti-Doping Code (Code).

The International Standards may be revised from time to time by the WADA Executive Committee after reasonable consultation with the Signatories and governments. Unless provided otherwise in the Code, International Standards and all revisions shall become effective on the date specified in the International Standard or revision.

Prohibited List

The Prohibited List (List) was first published in 1963 under the leadership of the International Olympic Committee (IOC). Since 2004, as mandated by the Code, WADA is responsible for the preparation and publication of the List.

The List is a cornerstone of the Code and a key component of harmonisation. It is an International Standard identifying substances and methods prohibited in-competition, out-of-competition and in particular sports. Substances and methods are classified by categories (e.g., steroids, stimulants, gene doping). The use of any prohibited substance by an athlete for medical reasons is possible by virtue of a TUE.

As outlined in the Code, a new version of the List is published every year, whether or not changes have been made. The List can be revised and published on an expedited basis should the need arise.

The List is developed through a highly consultative process, beginning with the circulation of a draft List among more than 1,700 Stakeholders for comment. The comments received are processed by WADA's scientific committees, which are composed of

international scientific and anti-doping experts. WADA's Expert Group responsible for the List analyses stakeholder input and presents its conclusions to WADA's Health, Medical and Research Committee, which in turn submits its final recommendations to WADA's Executive Committee at its annual September meeting. The Executive Committee, WADA's ultimate policy-making body, discusses the recommendations and makes a final decision. The new List is published online by 1 October, and goes into effect on 1 January of the following year.
(See *References*, page 52)

The Code (Article 4.3 Criteria for including substances and methods on the Prohibited List) outlines the criteria that are to be considered for inclusion of a substance or method on the List. A substance or method meeting two of the following three criteria may be considered for inclusion on the List. **These include:**

- performance enhancement: medical or other scientific evidence, pharmacological effect or experience that the substance or method, along or in combination with other substances or methods, has the potential to enhance or enhances sport performance
- threat to athlete health: medical or other scientific evidence, pharmacological effect or experience that the use of the substance or method represents an actual or potential health risk to the athlete
- violates the spirit of sport: WADA's determination that the use of the substance or method violates the spirit of sport as described in the introduction to the Code. **(See *The Spirit of Sport & the Fundamental Rationale for the World Anti-Doping Code*, page 51)**

International Standard for Testing and Investigations

The main purpose of the International Standard for Testing and Investigations (ISTI) is to plan for effective testing both in- and out-of-competition, to maintain the integrity and identity of the samples collected from the point the athlete is notified of the test to the point the samples are transported to the laboratory for analysis, and to monitor Anti-Doping Organisations' (ADO's) responsibilities with regards to investigations and intelligence-gathering.

The ISTI includes standards for test distribution planning, notification of athletes, preparing for and conducting sample collection, security/post-test administration and transport of samples.

In addition, the ISTI sets out mandatory standards to be implemented by International Federations (IFs) and National Anti-Doping Organisations (NADOs) (as well as those recognised and applied by other ADOs) as to the whereabouts requirements applicable to athletes in their respective Registered Testing Pools (RTPs). **(See *Whereabouts*, page 48)** Failure to comply with such requirements three times in a 12-month period shall constitute an anti-doping rule violation under Article 2.4 of the Code.

The World Anti-Doping Programme encompasses all of the elements needed in order to ensure optimal harmonisation and best practice in international and national anti-doping programmes. Like all Standards, while the ISTI outlines the mandatory standardised technical points for sample collection, it is supported by guidelines that outline best practices for given topics outlined in the ISTI. For example, the *Guidelines for Urine Sample Collection* provide for best practices for implementing a urine sample collection.
(See *References*, page 52)

The second purpose of the ISTI is to establish mandatory standards for the efficient and effective gathering, assessment and use of anti-doping intelligence and for the efficient and effective conduct of investigations into possible anti-doping rule violations. The 2015 Code makes clear that anti-doping rule violations can be proved by any reliable means. This includes both analytical and non-analytical evidence obtained through investigations. Many of the most high-profile successes in the fight against doping have been based largely on evidence obtained either by ADOs or the civil authorities through the investigations process. There is a strong consensus among the stakeholders that the role of investigations in the fight against doping should be highlighted in the Code and that cooperation of governments and all stakeholders in anti-doping rule violation investigations is important.

International Standard for Laboratories

The main purpose of the International Standard for Laboratories (ISL) is to ensure laboratory production of valid test results and evidentiary data and to achieve uniform and harmonised results and reporting from all WADA accredited laboratories.

The ISL includes requirements for obtaining and maintaining WADA accreditation of laboratories, operating standards for laboratory performance and a description of the accreditation process.

WADA will publish, from time to time, specific technical recommendations in a Technical Document. Implementation of the technical recommendations described in the Technical Documents is mandatory and shall occur by the effective date specified in the Technical Document. Technical Documents supersede any previous publication on a similar topic, or if applicable, this document. The document in effect will be that Technical Document whose effective date most recently precedes that of sample receipt date.
(See *References*, page 52)

International Standard for Therapeutic Use Exemptions

The purpose of the International Standard for Therapeutic Use Exemptions (ISTUE) is to ensure that the process of granting Therapeutic Use Exemptions (TUEs) is harmonized across all sports and countries.

The Code permits athletes to apply for TUE (i.e. permission to use, for therapeutic purposes, substances or methods contained in the List of Prohibited Substances or Methods) where use would otherwise be prohibited.

The ISTUE includes criteria for granting a TUE, confidentiality of information, the formation of Therapeutic Use Exemption Committees (TUECs) and the TUE application process. The TUE Guidelines were developed as a model of best practice to provide ADOs with assistance throughout the TUE procedure. To provide further support, Medical Information to Support the Decisions of TUECs documents are available to guide and assist TUECs in the decision making process for TUE applications.
(See *References*, page 52)

International Standard for the Protection of Privacy and Personal Information

The purpose of the International Standard for the Protection of Privacy and Personal Information (ISPPPI) is to ensure that Anti-Doping Organisations (ADOs) apply appropriate, sufficient and effective privacy protections to the personal information they process when conducting anti-doping programmes, in recognition of the fact that personal information gathered in the anti-doping context can impinge upon and implicate the privacy rights and interests of persons involved in and associated with organised sport.

The Code, in particular, requires athletes and athlete support personnel to provide a significant amount of personal information to ADOs. As a result, it is essential that ADOs appropriately protect the personal information that they collect both to meet legal standards and to ensure the continued confidence and trust of those who participate in organised sport.

The Code recognizes and affirms the importance of ensuring that the privacy interests of persons participating in anti-doping programmes based on the Code are fully respected. In support of this commitment, the ISPPPI provides mandatory rules and standards relating to the protection of personal information by ADOs.

Consistent with other International Standards that have been developed and implemented to date, the ISPPPI sets forth a minimum, common set of rules to which ADOs must conform when collecting and handling personal information pursuant to the Code. In some cases, ADOs may be required by applicable laws to apply rules or standards that exceed those set forth in this Standard.
(See *References*, page 52)

How Doping is Fought

As the definition of doping (See "Definition of Doping", page 11) suggests, there are many ways of determining whether an athlete is guilty of an anti-doping rule violation (ADRV). The traditional strategy for combating doping in sport has been a three-pronged approach, relying on testing, research and education, and focusing squarely on the athlete.

This section explains how the anti-doping community fights doping through sample collection, the Athlete Biological Passport (ABP) programme and through investigations.

Doping Control Process

The terms 'doping control process' and 'sample collection process' are often used interchangeably; there is, however, a slight difference in how these terms should be used. The doping control process includes everything from athlete selection, athlete notification, and sample collection, to delivery of samples to the World Anti-Doping Agency (WADA) accredited laboratory as well as the results management process, whereas sample collection simply involves collecting the urine or blood sample from an athlete. The doping control process is carried out in accordance with the World Anti-Doping Code (Code) and the International Standard for Testing and Investigations (ISTI).

Types of Samples

There are currently two types of biological material that are collected and analysed by WADA accredited laboratories for doping control purposes – urine and blood. Each type of sample is used for the detection of certain substances. This means that an athlete could not choose to provide a blood sample instead of providing a urine sample.

Urine is most commonly collected to analyse for most prohibited substances and increasingly blood is collected and used to detect certain substances such as human Growth Hormone (hGH) and CERA.

In-competition and out-of-competition testing

Anti-Doping Organisations (ADOs) can conduct testing in-competition and out-of-competition. Athletes who compete at the international and national level may be tested anytime, anywhere.

In-competition testing is when an athlete is selected for testing in connection with a specific competition (i.e. Universiade, National Championships, Olympic Games, World Cup). Athletes are selected for testing based on the regulations of the relevant International Federation (IF) or event ruling body. These criteria may include finishing position (e.g. top 4 places in an event), random selection, or a target test.

Out-of-competition testing is when an athlete is tested outside of an event and this can take place at any time and at any place, with no advance notice to the athlete. This means that athletes may be tested at their home, training locations, work place or anywhere else they can be found. ADOs decide when and where the athlete will be tested.

To allow for out-of-competition testing, some athletes are required to provide accurate and current Whereabouts information. This information includes details which will help a doping control officer (DCO) find the athlete on any given day such as a home address, work schedule, training venue and schedule, and competition schedule.
(See *Whereabouts*, page 48)

Athlete notification

Notification of an athlete's selection for doping control should occur as soon as possible, either upon arrival of the DCO at the venue for an out-of-competition test or after an athlete finishes their competition. The DCO (or chaperone) should attempt to notify the athlete discretely (i.e. in private, away from public areas).

During notification, the DCO or chaperone must explain to the athlete that he/she must remain in sight of the chaperone or DCO at all times until the sample collection process is complete. The notification section of the doping control form must be completed, including having the athlete read and sign the form. The athlete will be informed that he/she will be required to present identification at the doping control station and can be accompanied by a representative. The athlete must report to the doping control station immediately after notification, unless there are valid reasons for a delay. The DCO or chaperone will establish whether the athlete has any activities they must complete prior to reporting to the doping control station (e.g. medal ceremony, media commitments, medical treatment, competition in another event, warm down or the requirement of either an interpreter, representative, clothing or identification). Any reason for not reporting to the doping control station immediately following notification will be indicated on the doping control form. The athlete will remain chaperoned from notification to the completion of the testing procedure. During media commitments or medal ceremonies, chaperones will ensure that they are not visible so that it is not obvious that the athlete has been selected for doping control. The DCO or chaperone will document any occasion where they lose sight of the athlete or the refusal of the athlete to comply with any of the requirements of the doping control process including remaining with the DCO or chaperone.

Sample collection

Procedures for sample collection are as follows:

- A sample must be collected once the athlete has been notified.
- The athlete should have a choice of at least three collection vessels.
- The chaperone or DCO observing sample provision must be of the same gender as the athlete.
- The athlete must wash his/her hands prior to providing a sample.
- The chaperone or DCO must have an unobstructed view of sample provision.
- The athlete must be encouraged to empty his/her bladder when providing a sample.
- Following sample provision the lid should be placed onto the vessel to cover it.
- The athlete and DCO/Chaperone must then return to the processing area to complete the division and sealing of the sample.
- The athlete's sample should meet minimum volume requirements of 90 mL of urine.
- The athlete has a minimum of three sample collection kits to choose from.
- The athlete verifies that the A and B bottles and all other parts of the sample collection kit have the same sample code number.
- The minimum amount of 30 mL of urine is poured into the B bottle. The minimum amount of 60 mL of urine is poured into the A bottle. The A and B bottles are securely sealed.
- The details of the bottle number, volume and specific gravity are recorded on the doping control form.
- All applicable areas of the doping control form are completed and a line is drawn through any non-applicable areas.
- The athlete is the last person to sign the doping control form.

Laboratory analysis

The information sent to the laboratory will be confidential, and the WADA accredited laboratories must respect the chain of custody and the International Standard for Testing and Investigations. The A sample will be opened and analysed, while the B sample will be stored in a cool and secure place. Results are sent to the ADO and WADA.

Results management

An athlete's sample is divided into two, referred to as the A sample and a B sample. The laboratory that has analysed the A sample will report the results simultaneously to the ADO responsible for results management and WADA.

If there is an adverse analytical finding (AAF) on the A sample, the organisation responsible for results management will conduct an initial review. If the initial review supports the AAF, the athlete is notified in writing of the results and rights regarding the analysis of his/her B sample.

Should the B sample analysis confirm the A sample analysis, the responsible ADO will proceed with the results management process including the athlete's right to

a fair hearing. The hearing will determine whether an anti-doping rule violation has occurred, as well as determine what sanctions will be imposed. In the event that the B sample analysis does not confirm the A sample analysis, no further action with the ADRV will be taken.

When an ADRV is found, the ADO that authorized the sample collection is responsible for initiating the results management process. An independent panel will determine what sanctions will apply to each individual case, and an athlete will be given the opportunity to establish a basis for eliminating or reducing the sanction.

Sanctions for violating anti-doping regulations may range from a warning to a lifetime ban. The period of ineligibility may vary depending on the type of ADRV, the circumstances of an individual case, the substance, and the possible repetition of an anti-doping rule violation. For in-competition testing, this will automatically include disqualification of results obtained in that competition and forfeiture of any medals, points, and prizes. All results of any competitions following collection of the sample may also be disqualified.
(See *Sanctions*, page 87)

Athlete Biological Passport

The fundamental principle of the Athlete Biological Passport (ABP) is based on the monitoring of selected parameters which indirectly reveal the effects of doping, as opposed to the traditional direct detection of doping. In a sense, one is comparing intra-individual variability over time rather than inter-individual differences and thresholds. Biological tracing throughout an athlete's sporting career should make any illegal preparation far harder to implement.

From a medical point of view, this biological monitoring is also likely to illustrate biological disturbances linked to pathological processes, whether or not these are the result of doping manipulation. If necessary, early and effective medical intervention can thus take place.

In its final form, the ABP will be used to meet the two-fold objective of improving the effectiveness of the fight against doping and protecting the health of athletes. At the same time, it shall also further support the intelligent targeting of athletes for doping control.

The concept of an ABP has been discussed by WADA since 2002. It gained further momentum as a result of questions raised during the 2006 Olympic Winter Games surrounding 'no start' suspensions of athletes by their federations following health checks that reported high haemoglobin levels. Some concerns were expressed at the time regarding the methodology and its relation to anti-doping.

Cognisant of the varying approaches to blood parameters among different sports, WADA convened a meeting to foster exchange of information and to develop a consensus on the topic. The participants (representatives of international sports

federations including ski, biathlon, skating, cycling, and athletics) agreed that the analysis of blood parameters should be considered as part of the anti-doping process itself as it can help to identify suspicious profiles, and that WADA should take the lead in convening further meetings of relevant experts in the field of haematology.

Through a series of meetings, the groups came to the consensus that the longitudinal analysis of athlete blood parameters should be registered in a database, and should be used in target testing and sanctioning when abnormal values are observed.

The longitudinal analysis of biological parameters is now included in anti-doping rules (with the possibility for sanction); the data collected under the ABP model are reviewed by an independent panel of experts, and the mathematical model used for analysis compares reference values obtained per individual as opposed to population-based reference values.

In December 2009, WADA's Executive Committee approved harmonized protocols and operating guidelines for the ABP. These protocols and guidelines provide anti-doping organisations worldwide with a harmonized, scientifically sound and legally robust framework to pursue ADRVs related to Article 2.2 of the Code (Use or Attempted Use by an Athlete of a Prohibited Substance or a Prohibited Method) and to support more intelligent testing by identifying athlete profiles over time in order to 'target' testing more intelligently.

As WADA's duty is to monitor and coordinate the global harmonized fight against doping in sport, it will therefore monitor the ABP programmes of ADOs.

There is no intent to replace traditional anti-doping testing; however, if urine and blood tests, which are essentially toxicology tests, are to be maintained and improved through increasingly sophisticated analytical methods, these will inevitably have to be rapidly combined with effective tools such as biological monitoring. In view of the challenges posed by current and future biotechnological methods, an increasingly global and biological approach, similar to that used in forensic science, is necessary in order to respond with the expected efficiency.

The fight against doping relies on several strategies, including the direct testing of athletes as well as evidence gathered in the context of non-analytical doping violations. By combining these strategies, and seeking new ones to address emerging threats, the global fight against doping is more effective.

Although compliance with the ABP Guidelines is obligatory for those anti-doping organisations that choose to adopt the approach, the model itself is not mandatory for Code signatories. There are currently two live modules within the ABP Programme: the haematological (blood) to detect blood doping and the steroidal (urine) to detect anabolic steroids. The haematological module was implemented in 2009 and the steroidal in 2013. The implementation of the haematological module

to date has been limited to a modest number of well-developed and well-resourced ADOs who collect blood samples specifically for this analysis. The expectation going forward is that any ADO with responsibility for sports and athletes who are at risk of blood doping will adopt this approach. This will be based on a risk assessment required as part of the 2015 Code and International Standard for Testing and Investigations (ISTI). All ADOs automatically subscribe to the steroidal module as all data is stored in the Anti-Doping Athlete Management System (ADAMS) based on the results of urine analysis. Beyond the technical requirements, a programme requires a team of experts to evaluate cases deemed suspicious by the mathematical model. WADA fields questions from stakeholders and sample collection agencies on the requirements to establish an ABP programme and will provide support and advice in this respect.

WADA Technical Document for Sport Specific Analysis

In relation to the risk of doping, it is clear that there are certain sports/disciplines that are at a higher risk for specific types of substances based on the performance enhancement benefits to be gained. For example, pure endurance sports carry a higher risk of athletes taking erythropoietin (EPO), whereas pure strength or power sports are at a higher risk of use of anabolic steroids.

With this in mind, the Technical Document for Sport Specific Analysis (TDSSA) was developed by WADA, in consultation with International Federations (IFs) and other Anti-Doping Organisations (ADOs), to ensure that prohibited substances that are deemed to be at risk of abuse in certain sports/disciplines are subject to an appropriate and consistent level of analysis by all ADOs.

The TDSSA was primarily based on a physiological risk assessment of each sport or discipline to the potential performance enhancing benefits of the prohibited substances outlined within the scope of the technical document. These prohibited substances include: erythropoiesis stimulating agents (ESAs), growth hormone (GH), growth hormone releasing factors (GHRFs) including growth hormone releasing hormone (GHRH) and its analogues, growth hormone secretagogues (GHS), and growth hormone peptides (GHRPs). These prohibited substances are not currently part of a routine standard urine analysis and require specialised analysis methods.

The TDSSA specifies a Minimum Level of Analysis (MLA) for each of the prohibited substances listed above for each sport/discipline. The MLA is expressed as a percentage and applied to the total number of tests the ADO has planned for a given period to determine the minimum number of analyses that must be conducted by an ADO as part of their test distribution plan. For example, under the TDSSA, in triathlon, which is an endurance based sport, 60% of their tests must be analysed for the detection of ESAs and 10% must be analysed for GH or GHRFs, whereas weightlifting, which is an anaerobic power based sport, is only required to conduct analyses on 5% of its tests for the detection of ESAs , but at least 30% must be analysed for the detection of GH and GHRFs.

In order to enhance the quality of anti-doping programmes, the TDSSA strongly recommends that the Athlete Biological Passport (ABP) haematological module **(See *Athlete Biological Passport*, page 39)** be implemented for sports or disciplines for which the MLA for ESAs is 15% or greater.

The TDSSA is a tool that will further protect clean athletes by ensuring that every National Anti-Doping Organisation (NADO), IF and Major Event Organiser implements the required minimum level of analysis on those applicable sports and disciplines globally. Compliance with the TDSSA is mandatory under the 2015 Code.

Investigations

Major busts have demonstrated that doping often occurs on a broad scale and involves the participation of well-financed and well-organized members of the athletes' entourage—those who profit from athletes' success, derived from doping, while risking very little themselves.

Heightening the risk is the ease with which one can gain access to doping substances and information via the Internet or through other trafficking avenues.

Based on experience gained, evidence gathered, and lessons learned in the first ten years of its existence, it is WADA's firm view that to succeed in the fight against doping in sport and protect the rights of clean athletes everywhere, ADOs need to move beyond drug-testing alone to develop additional ways of gathering, sharing and exploiting information and evidence about the supply to and use of prohibited substances and methods by athletes under their jurisdiction.

The importance of Investigations has been reflected in the development of the 2015 International Standard for Testing and Investigations, previously titled International Standard for Testing. A purpose of this is to establish mandatory standards for the efficient and effective gathering, assessment and use of anti-doping intelligence to inform and identify possible occurrences of anti-doping rule violations.

While drug-testing will always remain an important part of the anti-doping effort, it is not capable on its own of uncovering and establishing most of the ADRVs in the Code that ADOs must investigate and pursue. In particular, while the violations of presence and use of prohibited substances and methods can be uncovered by laboratory analysis of urine and blood samples collected from athletes, other ADRVs such as possession or administration of or trafficking in prohibited substances or methods, can only be effectively identified and pursued through the collection of 'non-analytical' anti-doping information and evidence.

This means new investigative methods and techniques have to be deployed, and new partnerships have to be forged, particularly between the sports movement and public authorities engaged in the broader fight against doping in society. These new partnerships will allow ADOs to take advantage of the investigative powers of those public authorities, including search and seizure, surveillance, and compulsion of witness testimony under penalties of perjury.

ADOs can support these law enforcement efforts by providing information and expertise that assists in understanding and developing the available evidence. And these law enforcement efforts in turn can help ADOs by uncovering reliable evidence for use in disciplinary proceedings against cheating athletes and coaches.

Examples to date include:

- the cases successfully brought by the United States Anti-Doping Agency (USADA) against athletes Michelle Collins, Tim Montgomery and Chrystie Gaines, as well as coaches Trevor Graham and Remi Korchemny, using evidence uncovered by the BALCO investigation
- the proceedings brought by the IOC and FIS against the Austrian skiers and/or their support personnel that the police caught with blood doping materials at the Turin Olympic Games
- the ban imposed on Australian cyclist Andrew Wyper in 2008 for attempted use of human growth hormone and EPO, based on information provided to the Australian Sport Anti-Doping Agency (ASADA) by Australian customs officials
- the ban imposed on Spanish cyclist Alexandro Valverde in 2010 for blood doping
- the ban imposed on American tennis player Wayne Odesnik in 2010 for possession of human Growth Hormone (hGH), again based on information from Australian customs officials that was supplied by ASADA to the International Tennis Federation (ITF)

There are therefore compelling reasons for ADOs and public authorities engaged in the broader fight against drugs in society generally to establish relationships and protocols facilitating mutual cooperation, including in particular the sharing of expertise and information uncovered by their respective investigations that may be useful in enforcing national laws and regulations (in the case of public authorities) or anti-doping rules and regulations (in the case of ADOs).

This is where the partnership between sports bodies and public authorities advanced by WADA comes into its own. Public authorities have always recognised the substantial public interest in fighting the scourge of drugs in society, because of the adverse impact that the use of drugs has on collective and individual health and safety. Indeed, it was that recognition that led governments to enter into a partnership with the sports movement in 1999, under the auspices of WADA, to fight the use of drugs in sport. If that commitment can be given further practical effect by exploiting the investigative powers and resources of public authorities to assist the enforcement efforts of ADOs, then even small ADOs with relatively limited resources of their own will be able to enhance greatly the impact and effectiveness of their anti-doping programmes.

WADA has entered into a cooperation agreement with Interpol that reflects the desire of both parties to coordinate their anti-doping efforts within the framework of their respective mandates, to cooperate in activities of common interest, and in particular to facilitate the exchange of information and expertise between them in order to advance their respective anti-doping goals.

SUPPLEMENTARY INFORMATION

WADA's Logo Story

The square shape of the logo background represents the customs and the rules that define sport. The colour black evokes neutrality and is the traditional colour of the referee.

The 'equal sign' expresses equity and fairness. The sign is depicted with a human touch to reflect the individuality of every athlete. The colour green evokes health and nature and the field of play.

The 'play true' tag line encapsulates WADA's core values and is intended as a guiding principle for all athletes at every level of competition.

FISU

The International University Sports Federation (FISU) is responsible for the organisation and governance of worldwide competitions for student-athletes between the ages of 17 and 28. It was founded in 1949 as the world governing body of national university sports organisations and currently has 163 member associations from five continental regions. It is the only international federation with more than 50 sports on its competition programme.

From an anti-doping perspective, FISU is considered a Major Event Organiser, as it is the responsible body for implementing anti-doping programmes during its events, which include summer and winter Universiades and the World University Championships. FISU became a signatory to the World Anti-Doping Code (Code) on 25 September 2004.

FISU is committed to safe and fair sport competition among university student athletes throughout the world. FISU has been the primary organisation for developing and overseeing university international sport competition since its beginning in 1949. FISU's anti-doping activities are under the responsibilities of the FISU Medical Committee and are overseen by the FISU President and FISU Executive Committee. FISU first became involved in anti-doping activities in the late 1970s.

FISU strongly supports the Code and was an early signatory (2004). FISU cooperates with other anti-doping organisations (ADOs) regularly including International Sport Federations (IFs), National Sport Federations (NFs), Regional and National Anti-Doping Organisations (RADOs, NADOs) and National University Sports Organisations.

Although testing and analysis is at the centre of FISU's anti-doping programme, education has become a major focus in its battle for clean sport. FISU was one of the first organisations to institute anti-doping education during a sport event and utilized WADA's Outreach programme at the 2001 Beijing Summer Universiade. FISU always tries to include education regarding issues of safety, good choices, fair and clean sport, and the adverse effects of doping during its Universiades.

Doping control

All testing is performed according to FISU and World Anti-Doping Programme rules and, when possible, according to the appropriate IF rules and regulations. If there is a significant difference between FISU/World Anti-Doping Programme and the given federation's rules, FISU will take precedence.

FISU is in charge of doping control during the period of the FISU sponsored event. FISU takes responsibility for athletes the moment they enter the accommodation supplied for a FISU governed competition. This for example is the athletes' village for the Summer or Winter Universiade but may be a hotel for a World University Championship or for the Winter Universiade. An athlete is subject to testing from the time they enter the athletes' village or 2 days prior to the event, whichever is earlier, until after the event or when they leave the official accommodations, whichever is later.

In practical terms, this means all athletes are subject to pre-competition testing and in-competition testing once they enter the official accommodation. FISU uses both random and target testing, and FISU selects the athletes for testing. The FISU Medical Committee will develop a reasonable doping control plan for the competition and oversee the appropriate collecting agency. FISU has agreed to use blood and urine samples in testing at all FISU competitions. FISU also agrees to cooperate with all NADOs, RADOs, IFs and WADA if additional testing is requested and if additional investigations are requested. FISU, as the responsible anti-doping organisation for their events, may delegate the responsibility for sample collection, including selecting and training DCOs, storage of samples and transportation to the laboratory of samples to the local organising committee, which FISU strongly encourages to contract the appropriate NADO or RADO to carry out these functions. When possible, ADAMS is used for results management. All results are initially sent to the Chairman of the FISU Medical Committee.

Laboratory analysis

All samples collected through FISU's doping control programme are analysed at a WADA accredited laboratory. The Local Organising Committee (LOC) will select the most appropriate laboratory to carry out the analysis.

Anti-doping rule violations

FISU will set in place a hearing body to review all potential anti-doping rule violations (ADRVs), including adverse analytical findings (AAFs). This body will promptly notify the athlete of the potential ADRV and may provisionally suspend the athlete, depending on the circumstances. The athlete has the right to immediately appeal such provisional suspension. The hearing body will then review all aspects of the individual's sample collection, laboratory reports, previous testing authority and TUE, and grant the athlete the possibility to participate in a hearing, in order for the athlete to provide his or her explanations. The hearing body will then render a final decision as to whether an ADRV has occurred. The athlete has the right to appeal such decision.

Cost of doping control programme

The LOC is responsible for the cost of all aspects of the doping control programme.

Therapeutic Use Exemptions (TUEs)

The FISU Medical Committee will not routinely provide TUEs for its athletes. FISU expects all athletes to apply for a TUE when necessary to their appropriate International Federation (IF), National Anti-Doping Organisation (NADO), or Regional Anti-Doping Organisation (RADO). If an athlete is unable to apply to the above organisations for a TUE or has an appropriate reason (appointed to a team too late to apply, emergency medical situation), the FISU Medical Committee will have a committee (TUEC) to consider these TUEs. The athlete must present all information required for a regular TUE in order for the FISU TUEC to make a final decision. FISU does recognize all TUEs issued by an athlete's NADO, RADO or IF but reserves the right to review the TUE and may ask for clarification or refer it to WADA for further consideration. A TUE granted by FISU may be overturned by WADA. A FISU issued TUE is only valid for the relevant FISU event.

Penalties

If an athlete is caught cheating, FISU, as the Games Organiser, has the ability to remove a medal from the athlete, demand that the athlete leave the FISU competition, and demand that the athlete leave the accommodations sponsored by the FISU event. If the athlete participates in a team sport, his/her position or points cannot count towards a team medal. FISU also has the ability to ban a cheating athlete from any further FISU events. Additional results management and penalties are to be applied by the respective IF, NADO, RADO or the athlete's student organisation. Results will be shared via ADAMS with WADA, and the relevant IF and national organisations.

Challenge of results

If the FISU hearing body determines that an ADRV has occurred, the athlete, all appropriate federations and WADA will be notified. The athlete may request an analysis of his/her B sample. The athlete or his/her representative has the right to attend the opening and/or analysis of the B sample. FISU has the right to give a provisional suspension when there is an AAF. The athlete may appeal the FISU hearing body's results to the FISU.

ADAMS

Under the World Anti-Doping Code (Code), the World Anti-Doping Agency (WADA) has an obligation to coordinate anti-doping activities and to provide a mechanism to assist stakeholders with their implementation of the Code.

The Anti-Doping Administration & Management System (ADAMS) was developed for this purpose. It is a Web-based database management system that simplifies the daily activities of all stakeholders and athletes involved in the anti-doping system.

ADAMS is a clearinghouse where all data can be stored, in particular athlete whereabouts, laboratory results, Therapeutic Use Exemptions (TUEs), information on anti-doping rule violations (ADRVs), and increasingly Athlete Biological Passports (ABP). ADAMS facilitates the sharing of information amongst relevant organisations, thus minimizing the duplication of testing efforts and costs. ADAMS, through its transparency, enhances the efficiency and effectiveness in all anti-doping activities of the stakeholder organisations.

Athlete Whereabouts Module

The Web-based functionality allows athletes to comply with the Whereabouts rules of their sport by entering their information from anywhere in the world. Additionally, ADAMS supports the delegation of this responsibility to an authorized representative such as team manager, agent or other third party. This functionality also helps anti-doping organisations (ADOs) share Whereabouts information, crucial for supporting athletes so that they do not need to enter their Whereabouts more than once via multiple means. Athletes can also modify their Whereabouts through the use of SMS messaging to ADAMS, and since 2013 through a free ADAMS Whereabouts App for smartphones. Using their smartphone (iOS and Android) athletes can enter, check and change their whereabouts details at any time with just a few clicks.

TUE Module

ADAMS facilitates online management of TUE requests, as well as online notification to those involved in the process. TUE information is shared with all and only relevant parties, thus for the athlete one submission is all that is necessary. Upon approval of the TUE, ADAMS also provides athletes with the option to print their Certificate of Approval for their records.

Test Planning & Results Management Module

The ADAMS doping control database provided to ADOs is an essential tool for managing both an in- and out-of-competition doping control programme. Stakeholders can use ADAMS to plan, coordinate and order tests, as well as to manage test results. Coordination of doping control programmes in the ADAMS system helps to avoid duplication of testing efforts and harmonises communications among testing authorities, sample collection agencies as well as WADA accredited laboratories.

Laboratory Results Module

WADA accredited laboratories must use ADAMS to submit test results to the appropriate authorities including WADA. In this way, Results Management Organisations are notified of results promptly and clearly, and WADA is automatically engaged to ensure transparency in all results management processes.

Athlete Biological Passport (ABP) Module

The fundamental principle of the Athlete Biological Passport (ABP) is to monitor selected variables (`biomarkers of doping´) over time that indirectly reveal the effect of doping, as opposed to the traditional direct detection of doping by analytical doping controls. The ABP module in ADAMS comprises a Haematological and a Steroidal sub-module. The Haematological Module monitors an athlete's unique haematological (blood) variables over time that may be indicative of the effects of blood doping, such as blood transfusions or the use of Erytrhopoiesis-Stimulating Agents (ESAs). These haematological variables form a `blood profile´ that is measured from an athlete's blood samples. The Steroidal Module monitors an athlete's steroidal variables over time that may be indicative of steroid abuse. These steroidal variables form a `steroid profile´ that is established from an athlete's urine samples.

In ADAMS, an athlete passport will be automatically generated and will be available to the Athlete Passport Management Unit (APMU) of its passport custodian. An APMU is composed of persons designated by the anti-doping organisation to administer an ABP. The Unit, ideally a WADA accredited laboratory-associated APMU, is responsible for the administrative management of Athlete Passports, advising the anti-doping organisation on intelligent target testing, liaising with the Expert Panel, compiling and authorizing an ABP Documentation Package and reporting Adverse Passport Findings. The passport custodian is the organisation in charge of the results management of the athlete biological passport (ABP). The Experts assigned by the APMU review the Passport anonymously (without reference to the specific athlete by name) and conduct their activities in strict confidence.

Whereabouts

Whereabouts is information provided by a limited number of top elite athletes about their location to the International Sport Federation (IF) or National Anti-Doping Organisation (NADO) that included them in their respective Registered Testing Pool. This is part of these athletes' anti-doping responsibilities.

Given that out-of-competition doping controls can be conducted without notice to athletes, they are one of the most powerful means of deterrence and detection of doping and are an important step in strengthening athlete and public confidence in doping-free sport. Accurate Whereabouts information is crucial to ensure efficiency of the anti-doping programmes, which are designed to protect the integrity of sport and to protect clean athletes.

The concept of out-of-competition testing is not new. Experience has shown that out-of-competition testing is crucial to the fight against doping, in particular because a number of prohibited substances and methods are detectable only for a limited period of time in an athlete's body while maintaining a performance-enhancing effect. The only way to perform such testing is by knowing where athletes are, and the only way to make it efficient is to be able to test athletes at times when cheaters may be most likely to use prohibited substances and methods.

2009 changes

To build on the practical experience gained by WADA and its stakeholders (the sport movement and governments of the world) in the implementation of the World Anti-Doping Code (Code) since its inception in 2004, WADA undertook a full review of the Code and associated International Standards commencing in 2006.

Throughout the consultation process, there was a clear call from all participants for greater harmonisation and standardisation of rules for the provision of athlete whereabouts information and missed tests.

Stakeholders had initially wanted some flexibility in the drafting of the original Code and International Standards that took place from 2001 to 2003. As a result, these provided broad flexibility for ADOs with respect to:

a. what whereabouts information needed to be collected

b. what constituted a missed test

c. how many whereabouts filing failures/missed tests had to be committed (and in what period) to constitute an anti-doping rule violation under article 2.4 of the Code

d. what sanctions could be imposed

One consequence of the lack of standardisation was that it was sometimes problematic for one ADO to recognize a missed test declared on an athlete by a different ADO with testing authority over that same athlete. Another was the perceived unfairness arising from the lack of harmonisation of sanctions, because athletes from the same country but from different sports were subjected to differing lengths of sanctions.

For these and other reasons, consultation identified a pressing need to create a mandatory standard set of whereabouts requirements, applicable to all sports.

The two major changes that resulted from the revision of the 2004 World Anti-Doping Code and the International Standard for Testing (IST) in relation to whereabouts information and missed tests were:

– the requirement for top-level athletes included in the Registered Testing Pool from either their IF or NADO to specify one hour each day (between 6 a.m. and 11 p.m.) during which they could be located at a specified location for testing. (These athletes did not have to identify the 60-minute time-slot at a home address, but they could if they wished to - previously this was a 24 / 7 requirement.)

– the harmonisation of what constitutes an anti-doping rule violation in relation to whereabouts and missed tests and what potential sanctions could be applied. (Any combination of three missed tests and/or failures to provide accurate whereabouts information within an 18-month period would lead to the opening of a disciplinary proceeding by the ADO with jurisdiction over the athlete. Sanctions ranged between one and two years depending on the circumstances of the case. Previously, this was discretionary for ADOs with a suggested range of between three months to two years.

2015 changes

Beginning in 2011 and finishing at the 2013 World Conference on Doping in Sport, the Code was once again reviewed through the three-phase consultation process. The delegates in attendance approved the 2015 Code, which brought about several changes including alterations to whereabouts requirements.

Beginning January 1, the window in which an athlete may accumulate three whereabouts filings (filing failures or missed tests), which triggers an anti-doping rule violation, was reduced from 18 months to 12 months. The consensus was that twelve months is ample time for an Anti-Doping Organisation to accumulate three whereabouts failures on an athlete who is trying to avoid testing and that shortening the window reduces the risk that athletes who are simply careless in handling their paperwork will be found to have committed anti-doping rule violations.

Whereabouts violations may include a combination of filing failures and missed tests reported by either an International Federation or National Anti-Doping Organisation. The revised 2015 Code clarifies that the authority to conduct results management on account of the whereabouts violations is the responsibility of the Anti-Doping Organisation with whom the athlete files his or her whereabouts information.

Who is subject to these whereabouts requirements?

Whereabouts requirements are for the limited number of top-level athletes who are in the Registered Testing Pool (RTP) of either their IF or NADO. Requirements were designed to give those top-level athletes a flexible tool to show their commitment to doping-free sport, as well as appropriate, sufficient and effective privacy protection.

WADA is not responsible for deciding who should be part of these RTPs

IFs are afforded discretion as to who should be subject to these provisions internationally, and NADOs are afforded discretion to create a Registered Testing Pool at the national level. It is WADA's recommendation that RTPs be of proportionate and manageable size and focus on top international and national elite athletes.

Athlete management of Whereabouts information

Athletes can update their 60-minute time-slot and their Whereabouts at all times, including by emailing or text messaging their relevant ADOs. If they miss a test, they have the opportunity of providing a reason. If this excuse is accepted by the relevant ADOs, then the missed test is not part of any record and does not count as one of

three missed tests required within 12 months before any sanction is considered by the relevant ADO.

Athletes can have their agent or another representative submit their whereabouts information if they wish to. In team sports, whereabouts information can be submitted by team officials on a collective basis as part of the team's activities.

However, athletes are ultimately responsible for their whereabouts. As a result, they cannot avoid responsibility by blaming their representative or the team for filing inaccurate information about their whereabouts or for not updating their whereabouts if they were not at the location specified by them during the 60-minute time-slot.

Whereabouts requirements are a practical tool to help ADOs conduct effective out-of-competition testing. Irrelevant of whether they have been selected to be part of a Registered Testing Pool, athletes can still be tested out-of-competition by their IF, their NADO or other ADOs.

The Spirit of Sport & the Fundamental Rationale for the World Anti-Doping Code

Anti-doping programmes seek to preserve what is intrinsically valuable about sport. This intrinsic value is often referred to as the 'spirit of sport;' it is the essence of Olympism; it is how we play true. The spirit of sport is the celebration of the human spirit, body and mind, and is characterised by the following values:

Ethics, fair play and honesty
Health
Excellence in performance
Character and education
Fun and joy
Teamwork
Dedication and commitment
Respect for rules and laws
Respect for self and other participants
Courage
Community and solidarity

Doping is fundamentally contrary to the spirit of sport. To fight doping by promoting the spirit of sport, the Code requires each ADO to develop and implement education programmes for athletes, including youth, and athlete support personnel.

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UNIT 03

Therapeutic Use Exemptions

The World Anti-Doping Code (Code) provisions on Therapeutic Use Exemptions (TUEs) recognise the right of athletes to medical treatment. If the medication or method an athlete needs to treat an illness or condition (as prescribed by a health care professional) is included on the Prohibited List, a TUE will constitute the authorization required by the athlete to use the otherwise prohibited medication.

The International Standard for Therapeutic Use Exemptions (ISTUE) includes criteria for granting a TUE, confidentiality of information, the formation of Therapeutic Use Exemptions Committees (TUEC), and the TUE application process. The ISTUE sets forth the following criteria for granting a TUE:

a. The athlete would experience significant health problems if he or she did not use the prohibited substance or method.

b. The therapeutic use of the substance or method would not result in significant enhancement of performance other than the one that can be attributed to the return to a normal state of health after the treatment of the medical condition.

c. There is no reasonable therapeutic alternative to the use of the otherwise prohibited substance or method.

d. The necessity to use a prohibited substance or method must not be the consequence, total or partial, of a prior non therapeutic use of a prohibited substance.

Who grants TUEs?

All International Federations (IFs) and National Anti-Doping Organisations (NADOs) are required to have a process in place whereby athletes with documented medical conditions can apply for a TUE. Applications are to be appropriately dealt with by a panel of independent physicians called a TUEC. IFs and NADOs, through their TUECs, are then responsible for granting or declining such applications.

TUEs granted by NADOs are valid for national level competitions and TUEs granted by IFs are valid for international level competitions. Both IFs and NADOs must recognize TUEs granted by the other organisation, assuming that the TUE meets the criteria set out in the ISTUE. If a TUE is considered to not meet those criteria, the issue can be appealed to WADA for review. During this time, TUEs granted by NADOs remain in effect for national competitions, and TUEs granted by IFs remain in effect for international competitions. If the matter is not referred to WADA for review, the TUE becomes invalid for any purpose.

Major Events Organisations may also grant or deny TUEs for their specific events; however, the decision made by the Major Events Organisation is only valid for that specific event. Therefore if an athlete's TUE, which has been previously granted by a NADO, is refused by a Major Events Organisation, it will still be valid for national level competitions.

While WADA does not grant TUEs, it does have a two-pronged role in the TUE process. First, through its TUEC, WADA has the right to monitor and review any TUE granted by a federation or ADO and pursuant to such review, to reverse any decision. Second, an athlete who submits a TUE Application to a federation or ADO and is denied a TUE can ask WADA to review the decision. If WADA determines that the denial of the TUE did not comply with the ISTUE, it can reverse the decision.

Application Process

The process for an athlete to apply for a TUE is fairly simple:

- International athletes should contact their IF, and national level athletes should contact their NADO for a TUE application form and process.
- The physician who has provided the athlete with the prescription should complete the TUE application form, produce the required supporting documentation and forward this form and documentation to the IF or NADO (whichever applies).
- TUE applications should not be submitted to multiple organisations for approval. There is only one custodial organisation for a TUE at any one time. It is usually the NADO for national level athletes, and the IFs for international athletes.

WADA does not accept or grant TUEs although it may monitor the TUE process.

Granted TUE

As required by the ISTUE, the TUE application should be submitted at least 30 days before the athlete participates in an event.

TUEs are granted for a specific medication with a defined dosage. They are also granted for a specific period of time and therefore have an expiry date. The athlete is required to comply with all the treatment conditions set out in the TUE application.

If athletes with TUEs undergo testing, they should, when filling out the doping control form, declare the substance or medication being used and specify that a TUE has been granted. In such cases it is recommended, but not mandatory, for athletes to have a copy of their TUE approval form at hand, to show to the DCO.

If evidence of the use of a prohibited substance or method is discovered, verification will take place to ensure that:

- the TUE is still in effect
- the results of the analysis are consistent with the TUE granted (nature of substance, route of administration, dose, time frame of administration, etc.)

If the verification proves satisfactory, the result of the test will not result in an anti-doping rule violation.

Denied TUEs and Appeals

For an athlete who is not an international-level athlete:

According to the Code, Article 4.4.3, if the National Anti-Doping Organisation denies the application, the Athlete may appeal exclusively to the national-level appeal body.

For an athlete who is an international-level athlete:

According to the Code, Article 4.4.7, any TUE decision by an International Federation that is not reviewed by WADA, or that is reviewed by WADA but is not reversed upon review, may be appealed by the Athlete and/or the Athlete's National Anti-Doping Organisation, exclusively to CAS.

Gene Doping

We all understand the basic ideas of doping in sport. Many drugs have the ability to improve athletic performance by increasing the growth and strength of muscle, speeding recovery from injury, increasing the delivery of oxygen and removal of waste chemicals from exercising muscle, increasing alertness and response times, etc. The drugs used for these purposes such as steroids, amphetamines, growth hormones and erythropoietin (EPO), all have occasional legitimate uses in treatment of disease and injury but have been widely used in sport to try to enhance athletic performance.

Although functions like muscle size and strength, recovery from training and injury, the production and use of metabolic energy, are affected by many drugs, they are also determined to a great extent by our genes. Human cells contain and express approximately 25,000 genes, many of which determine not only our physical but also help to determine our personality and intellectual traits. They establish our underlying body pattern which is then refined and modified by athletic training, nutrition, thereby turning someone with athletic potential into a competitive athlete. Because it is the genes that define much of our athletic potential, it seems obvious that the potential can be enhanced by changing the kinds of genes that our cells contain and express.

Changing the kinds of genes that we carry or express may seem to be impossible, but recent advances in medicine have demonstrated that new normal genes can be introduced into various tissues of the human body to thereby possibly correct diseases which result from genetic mistakes that we inherit from our parents (inherited genetic diseases such as cystic fibrosis, muscular dystrophy, etc.) or that we acquire from toxins and DNA – damaging chemicals in our environment (probably most kinds of cancer, heart disease, and others). These are all 'genetic diseases' because they are caused by absence or abnormal expression of genes required for normal cell function. That realisation suggests that such diseases could therefore be corrected simply by putting normal copies of those genes back into the appropriate tissue. This approach is called 'gene therapy' and is meant to modify only the tissues of the treated person and not to change the genetic properties of the reproductive cells. Gene therapy therefore does not produce genetic changes in future generations. This approach to therapy has recently been shown to be effective in treating and possibly even 'curing' children born with severe abnormalities of their immune system, in some people with genetic forms of blindness, and in some kinds of cancer.

How can genes be introduced into human tissues for gene therapy? The most common method is to engineer a virus by removing the virus' own genes and replacing them with a copy of the therapeutic gene that one wants to introduce into a human being. Viruses are merely small packages of protein wrapped around DNA or RNA genes and have evolved to carry out one function—to deliver genes to cells. Recent advances in genetics have led to methods by which the virus' own genes can be removed or

inactivated and replaced by a therapeutic gene that is intended to restore a function lost in a genetic disease. The virus therefore cannot express its own disease-causing genes but instead becomes merely a delivery vehicle—a so-called 'vector.' However, such vectors do retain their ability to introduce their payload of genes directly into cells, but now the only effect of such a delivery is to restore a previously missing genetic function rather than express disease-causing viral genes. This is exactly the method used to treat the immune deficiencies, blindness and forms of cancer mentioned above. The techniques are powerful and effective, but they are full of dangers and risks. In fact, in the most exciting set of results in the genetic treatment of childhood immune deficiency diseases, a number of treated children have developed life-threatening leukaemia as a direct result of the genetic manipulation. In the cause of curing serious disease, risks are accepted by patients, families, doctors, and society as a whole. In the case of normal healthy athletes, such consequences would not be ethically acceptable if the manipulations are carried out without full disclosure of the risks, informed consent by the athletes and full compliance with established norms of human clinical research.

Another potential method of gene therapy involves the use of drugs that act in a completely different way—by modifying the way in which the cell's own genes re-express. For instance, some diseases are caused not by the absence of a gene or the presence of a defective gene, but rather by the abnormal level or abnormal timing of the expression of a gene. It is therefore possible in principle to treat such diseases with drugs that simply boost the level or that change the timing of the expression of the responsible gene. This method of therapy is less well advanced than the method of introducing genes by means of a virus vector, but nevertheless is an appealing approach to some genetic diseases.

Although these methods have all been developed for the legitimate purpose of treating disease, it is obvious that the identical methods can be applied to genetic manipulation not of disease-causing genes but instead to genes that affect normal functions such as muscle growth, production of red blood cells to carry oxygen to tissues, etc. This application of genetic methods to alter normal functions that can enhance athletic performance is called 'gene doping.'

What is WADA doing to counteract gene doping?

WADA is the world's major research and educational organisation devoted to an understanding of the technical potential and the dangers of gene-based doping and to developing methods for its detection. WADA has been alert to the potential for gene doping since its establishment in 2000. It has held a large number of workshops and symposia to educate the scientific and sport communities to the possibilities and the dangers of this potential form of doping (The Banbury Center in New York 2002, Boston 2003, Seattle 2004, Stockholm 2005, St. Petersburg 2008, Beijing 2013), and sponsored publication of a book on gene doping (Friedmann and Schneider, Gene Doping in Sports, Elsevier Press, 2006). The proceedings of a number of those workshops have been summarised as position statements and Meeting Declarations

(Banbury, Stockholm, and St. Petersburg) and are published on WADA's Web site. In the coming years, WADA plans to increase its programme of public discussion and education of the scientific, athletic and sports policy communities in gene doping through additional meetings, publication of position statements and educational programmes. Gene doping has also been included in WADA's List of Prohibited Substances and Methods.

In addition to these efforts, WADA has included a major emphasis on gene doping in its research programme, and over the past several years has devoted several million dollars of research funds to laboratories around the world to study the methods of potential application of genetic doping and to its detection. WADA has organised a new genetics panel to coordinate these research efforts and has also supported a new bioinformatics facility based in La Jolla, California, to provide a unified and centralised site for the evaluation of the genetic results being generated by WADA funded research projects.

What can we foresee in the future?

Fortunately, the powerful concepts and tools of modern genetics will increasingly be applied to the cure of terrible human diseases by gene therapy. It also seems inevitable the genetic methods will eventually be used not necessarily to cure disease but rather to enhance 'normal' human traits. An early example of this application might be the use of genetic techniques to prevent the 'normal' degeneration of muscle during normal human ageing. This degenerative change may not represent true human disease but it is certainly an area in which many people would like to take advantage of genetic tools to enhance muscle function and increase quality of life. Genetic enhancement therefore seems inevitable in the long run, but it should certainly await improvement in gene transfer and gene expression technology to prevent the unwanted consequences seen in the childhood immunodeficiency disease treatment.

Sadly, however, the temptations to use the same genetic methods to try to enhance athletic performance long before the methods are truly safe and fully predictable will probably be irresistible to some disreputable and irresponsible figures in sport. In fact, sport seems to represent one of the most likely areas for early application of gene enhancement technology. However, it is highly unlikely that such uses would include many or all of the basic requirements of human clinical experiments—full disclosure of risks to the athletes, completely free and informed consent and compliance with ethical norms. The absence of those safeguards would render the early use of current genetic method for enhancement in sport unethical.

How should sport professionals respond to the threat from gene doping?

Our society will increasingly be forced to confront the challenges of application of genetic methods for enhancement purposes, and sport seems to represent one of the most likely areas in which such challenges will arise. However, we must face that prospect with care and with respect for accepted standards of research with human beings. The techniques and tools of genetic modification are extremely powerful but

are still immature, and their potential for harm not fully understood. In the search for treatment of serious and even lethal disease, risks are a generally accepted part of clinical research, but it will be some time before the methods are well enough understood to make them acceptable for broad use in normal people, for the purpose of enhancing normal human traits.

Athletic representatives—team physicians, trainers, coaches, genetic entrepreneurs, etc. —who knowingly enable such use in the face of potential serious adverse consequences are guilty of professional misconduct. Athletes who knowingly allow themselves to be subjected to such dangerous experimental procedures are facing greater likelihood of very serious harm than of benefit to athletic performance. Furthermore, the consequences of gene-based manipulations are likely to be longer-lasting and less easily reversible than drug-based enhancement. More than ever, athletes should be increasingly aware of the manipulations that they allow themselves to be subjected to and MUST have a very high level of suspicion regarding the promise of genetic doping. Given the current state of maturity of gene transfer technology in gene therapy, such promised benefits in sport will be attached to a serious level of misrepresentation and danger.

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Performance Enhancement without Doping

In addition to reinforcing the spirit of sport, respect for rules and ethics, it is clearly not sufficient to propose an anti-doping philosophy to young athletes without also presenting balanced, legitimate, science-based alternatives for enhancing performance.

Athletes are aware that drugs like EPO and anabolic agents are effective to enhance performance in certain sports. Some even place success in sport above any health risk or ethical argument. It is therefore absolutely critical for sports physicians to be familiar with the current range of permissible means of performance enhancement. This demands knowledge of contemporary training techniques, biomechanics, nutrition, exercise physiology, sport psychology and coaching strategies. The physician must be familiar with the principles involved, but is not expected to have specialized expertise in each discipline. A reasonable knowledge of the World Anti-Doping Code (Code) is mandatory which must include a familiarity with substances and methods included in the Prohibited List and the process of Therapeutic Use Exemptions (TUEs).

Contemporary Training Techniques

Training serious athletes is no longer the domain of the part-time, 'amateur' coach. Contemporary coaching requires a significant time input and the accumulation of knowledge through practical experience and specialized academic input from an established university or technical institute. Degrees and diplomas in coaching are universally available, and it has become increasingly uncommon to meet an international athlete who is not trained by a professionally qualified coach. It is not within the scope of this section to cover all aspects of contemporary athletic training. A qualified sport physician should ideally have some understanding of training techniques and the disciplines of biomechanics, nutrition, physiology and psychology. This understanding is often obtained from collaboration with the coaches as well as colleagues with specialized knowledge. Furthermore, the sports physician must be aware of current coaching trends that could impact athlete health and wellbeing, particularly where the athlete is young and skeletally immature.

Where injury or ill health combine to affect the progress of an athlete, medical consultation is essential and for this to happen there must be an appropriate line of communication between coach and physician. The most critical requirement for the

sports physician is to build a collegial relationship with the coach and squad members, upon which appropriate and timely intervention becomes available. In many cases, team physicians will be very familiar with the special nature of each sport. Injury prevention programmes, the product of research and evidence-based clinical practice, have been widely implemented and in place for many years. In many cases the responsibility of the team physician is to identify athletes who may be 'at-risk' of overtraining or stress-related overuse. At the same time, common clinical conditions such as, for example, iron deficiency anaemia or chronic infection associated with the Epstein-Barr virus, may need to be ruled out as complicating causes for inappropriate fatigue, failing adaptation or poor athletic performance. There may be a demand for additional clinical scrutiny, investigation and management. The diagnosis of overtraining is not a simple one and must involve the coach and athlete and not simply be ascertained from blood tests. Some cases will require judicious involvement of coaching staff and may involve issues of patient confidentiality and ethics.

Support Services for Athletes

It is critical that the establishment of support services in sport remain 'athlete-centred.' A frequent misconception is that the team or squad support hinges on the demands of the coach. The reality is that one needs buy-in by the coach for the support team to function well. There are many models for athlete support and these will be dictated by a number of factors including:

- the nature of the sport (contact vs. non-contact)
- team vs. individual sports
- the demands of the competition in terms of travel schedules (home and away)
- the general age of participants (youth vs. 'mature' sport)
- environmental factors (indoor arenas vs. outdoor competition)
- gender considerations

Quite clearly there is no common model that fits all sporting codes. However, a constant factor is that athletes, at some stage in their sporting careers, experience the rate-limiting factors of injury or ill health. This must always be a medical responsibility with close and clear communication between doctor, coach and athlete.

Typically, injury in sport is declared as the result of a single, acute traumatic event such as collision or impact, or as the result of the accumulation of repetitive 'minor' traumatic influences. Sports physicians commonly acknowledge that the 'overuse' mechanism is by far the most common precipitant of sports injury. The diagnosis and management of these injuries should be overseen by a medical doctor, who, in close collaboration with allied health professionals such as physiotherapists, podiatrists and massage therapists may then decide upon strategies for acute management, subsequent rehabilitation and return to play.

Rehabilitation from Sports Injury

By definition, rehabilitation infers the restoration of normal structure and function and requires the full confidence of the injured athlete. This may begin with the early application of measures to modulate the effect of the acute inflammatory response. This is best achieved through the simple first aid measures of rest, ice, compression, and elevation, popularised by the well-known acronym RICE. The use of anti-inflammatory, analgesic medication may also be appropriate at this stage but only administered through legitimate medical channels and not at the whim of a well-meaning teammate or trainer. After confirming an accurate diagnosis, it is critical for the doctor to communicate with individual groups of people.

First and of greatest importance is the athlete, to whom a simple, clear and honest explanation is mandatory. This must include an outline of the proposed treatment plan, a likely prognosis and most importantly a realistic time frame for recovery. Experience confirms that those patients who have a good knowledge of their clinical problem achieve best results. A good rapport between doctor and patient engenders this confidence. Athlete compliance, critical for a satisfactory rehabilitation outcome, is directly related to this relationship. A competent clinician should always be prepared to discuss second opinions and entertain alternative therapies provided they have a sound basis, are ethically and legally acceptable and cause the athlete no ill effects. Similarly, the doctor should argue against 'quick fix' remedies to satisfy a rapid, and frequently temporary return to activity. In some instances this argument has its genesis in the indirect pressure applied by the coach, administration or even team sponsors; although it may well be the athlete's own unrealistic desires that are his/her own worst enemy. The inappropriate use of painkilling medication is a common example which is frequently not in the best long term interests of the athlete. The ethical, contractual and legal obligations of all members of the medical support staff must be clearly defined, and the health of the athlete must remain paramount. The doctor can facilitate this entire process by providing the athlete with a clear and understandable explanation of the diagnosis, prognosis and rehabilitation plan.

Consultation with coaching staff is also important; some may have preconceived and unrealistic expectations of the rehabilitative process. They might also express their own anecdotal, unscientific preference for treatment. However, with the permission of the athlete, it is important to discuss the nature of the injury and prognosis with the coach who is then more likely to support and respect the medical decision.

Once again this discussion ought to be conducted with honesty, frankness and a willingness to consider all therapeutic options. The collective coaching staff also deserves to be regularly updated on the injured athlete's progress, and this demands a clear line of communication with the athlete's full consent.

In the case of individual athletes, particularly the young, there is often an ominous influence of the overbearing, anxious parent. This is more common in sports like swimming, gymnastics and dance and those activities that encourage early competition. There is a strong argument that young athletes should be acquiring

a wide range of useful skills rather than learning to become intensely competitive. While the pre-adolescent athlete is at risk of a number of musculoskeletal problems, less well recognized is the psychological and emotional trauma that they frequently suffer at the hands of unsparing parents and clamorous coaches. Many clinicians will be aware that the demands of parents are often more significant than those of the coach. The temptation to provide short term, 'patch up' assistance to young athletes is not acting in accordance with a professional approach to long term health and wellbeing.

Also critical to the success of any rehabilitative process is the relationship between doctor and colleague health-care professionals. There is no rigid sequence of communication or collaboration because every injury scenario is unique. Frequently, there may be financial limitations that govern the extent of ancillary rehabilitative services affordable by the 'non-professional,' less well-insured athlete.

Some athletes are fiercely independent and self-reliant. They are sufficiently motivated to proceed with their own rehabilitation programme with the minimum of external input. Others are outrageously dependent upon as many physical and emotional support services that can be mustered. Between these two extremes of dependency, clinicians will agree that there lies an 'average' athlete whose response to injury is displayed by more appropriate emotional responses to injury. The assessment and management of these individuals becomes the clinical responsibility of the sport psychologist, in whom the wise sports doctor will invest great faith. The wisdom associated with such referrals develops from the doctor's experience and an understanding of the capabilities of the individual psychologist. From the physical perspective, rehabilitation requires active input from physiotherapists who utilize the modalities of electrotherapy and early, active mobilisation so critical to successful rehabilitation. Emotional influences are not so quantifiable, and the athlete's psychological welfare is frequently overlooked both at the time of injury and also when some element of 'fitness testing' becomes timely. At the end of the day, we owe it to our athlete patients to return them to their chosen sport in the knowledge that they have recovered from injury and are able to make a confident re-entry to activity. Incomplete rehabilitation will frequently result in chronic, smouldering problems that often result in premature retirement from sport.

It is helpful for the physician to understand the nature of the sport and the culture surrounding it. Although it is convenient if the physician was a former athlete with a deep understanding of a particular sport, this is often not the case. Nevertheless, a physician may learn by frank discussions with athletes and by engaging with coaches and therapists who are heavily involved in the sport. Participating at events as well as occasionally travelling with a team will give further insights to the nature and culture within that particular sport, which would allow for a more effective intervention.

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SUPPLEMENTARY INFORMATION

The Pharmaceutical Industry and the Fight against Doping in Sport

In its efforts to anticipate doping trends and practices, the anti-doping community works in close cooperation with pharmaceutical and biotechnological companies, as well as medicine agencies and drug evaluation bodies. While the focus of these industries is the development of medication and strategies for the treatment of medical conditions, these substances and methods could be used by athletes to enhance performance. All too often, it is said that athletes and those working with them are too far ahead of the anti-doping doping community, inferring that by the time a test for a new substance or method is developed, the athletes are already using or exploring the newer undetectable substance.

The World Anti-Doping Agency (WADA) has worked with the International Federation of Pharmaceutical Manufacturers & Associations, GlaxoSmithKline and Roche to identify medicinal compounds with doping potential, minimize misuse of medicines still in development, improve the flow of relevant information and facilitate development of detection methods in the context of the fight against doping in sport. Medicines in development by GlaxoSmithKline will be reviewed by scientists specifically to identify substances with a probable or high risk of abuse in sport. These scientists will look for any similarity to the pharmacological characteristics of existing performance-enhancing substances and assess how they work in the human body. This would include stimulatory effects or improved physical endurance. Any new medicines found to have performance-enhancing characteristics will be highlighted to WADA and confidential scientific data relating to them will be transferred by GlaxoSmithKline, so they can begin work on detection methods..

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UNIT 04

Ethical Considerations

The focus of the fight against doping in sport is often solely placed on creating and enforcing rules and testing athletes. Less emphasis is placed on the ethical rationale behind these rules or the role that athletes' value systems play on dissuading them from doping.

Skeptics often argue that there are so many other inequalities in sport that we should allow athletes to do as they please, or dope to enhance performance. They argue that the only way to truly level the playing field is to allow athletes to use whatever substances they want. As mentioned in a previous unit **(See *The Spirit of Sport & the Fundamental Rationale for the World Anti-Doping Code*, page 51)**, the fundamental rationale for the World Anti-Doping Code (Code) is to preserve what is intrinsically valuable about sport, as such promoting the spirit of sport.

Rules of the Game

From defining the objectives of the game (i.e. what counts as a goal, a run or a try, how the winner is determined) to rules that make attaining the objective more difficult, the rules that govern a sport are what makes it unique. Impediments to achieving the goal of a game, including players trying to prevent opponents from scoring and trying to score themselves, are not only what make the sport but also what makes the sport challenging and fun.

Fair play and sportsmanship have a long and venerable history in sport, although some would argue that both have fallen into popular disrespect. It is argued that the prime cause of this disrespect is the mistaken view that all that counts is a mark in the 'win' column, and it does not really matter how that win is accomplished.

Personal Integrity

Sometimes the type of moral challenges that people are faced with are essentially matters of personal integrity. Sport is not void of these personal moral dilemmas. Every time one is tempted to cheat or bend the rules, one is faced with a moral dilemma. In sport, it is often the case that the only person who is aware of the breach is the individual himself/herself.

What steps were taken from deciding what constitutes doing the right thing and actually doing it? People have to go through this sort of reasoning before acting with integrity. One of the functions of sport ethics is to identify the ways in which sport can help to teach moral integrity, and show how when sport goes wrong, it can undermine personal moral growth.

Cheating in Sport

Any time individuals enter a competition they are testing themselves against their opponents to see who can best perform the skills required by their sport or game on that day. When players cheat, they are taking themselves out of the game. They stop competing in the spirit of the sport; there is no longer a fair contest at the skills of the game. That is why cheating and consequently doping is so destructive to sport. If one person dopes and another does not, there is no real contest, and the point of sport has been destroyed.

Fundamental Ethical Principles of Sport

Sport is, or should be, a wonderful experience. Participating in sport allows people to stretch themselves to their limits, to test their bodies and their characters. Mastering or attempting to master the disciplines of a sport connects people's minds, spirits and, bodies.

However, sport is not a solitary occupation. Participating in sport unites people in teams and brings them together with opponents who share their love for the activity. Sport, any sport, played well, should be a source of joy to those who participate and to those who watch.

Following are some general concepts from the definition of the spirit of sport found in the Code that one must keep in mind when considering the fundamental ethical principles of sport. They are fairness, fun and joy, and respect for self and other participants.

Fairness

Fairness or fair play is the pre-eminent ethical value of competitive sport. Given that sports are contested, they must be fair; otherwise they are no longer sports but spectacles or pieces of visual entertainment. Fairness is a more complex concept than might first appear. In general, sports are fair if they are contested within their rules, but this concept of sporting fairness says nothing about what the content of those rules should be.

Of course, no one person is born with the same genetics; people do not have access to the same resources (whether financial, physical, technological, or even geographical); people do not have the same motivation and drive. In the end, all athletes carry things that may put them at an advantage or a disadvantage compared to others.

Even in these circumstances, for a sport contest to generate some interest, a level-playing field is essential. Evidence of the efforts of the sport community to help promote a level-playing field are everywhere, in admissibility rules and the creation of age, gender or weight categories, in the subsidised participation for the less fortunate, in the rules of the games themselves (allowing or limiting certain actions by participants), and ultimately also in anti-doping rules.

Fun and joy

Sport ought to be an activity that enriches and enhances human life. It should bring joy to those who compete and those who watch or participate in other ways. The use of some substances or training methods can not only destroy health, but also the possibility for joy.

While hard-work, commitment and dedication are essential for success in sport, and one will not always experience fun and joy at every moment of training and preparation, no training practice should so alienate athletes from their sport that the joy of sport, or the spirit of sport, is destroyed for them.

Respect for self and other participants

If the last principle was concerned with preserving something special about sport, this principle is concerned with preserving something special about human beings and their relation to sport. The International Olympic Committee's Charter speaks about sport being everywhere in the service of humanity. This idea is important because it stresses the point that sport is for people – they are not to be used for sport. It would be a mistake and contrary to these fundamental principles to permit a practice that turned athletes or their bodies into machines that serve sport.

Ethical Rationale for Prohibiting Doping

Why should doping be prohibited from sport? What substances or methods should be prohibited? What steps should be taken to enforce the anti-doping regulations?

The reasons for prohibiting doping in sport can be expanded in the form of four arguments, categorized on the basis of the type of appeal they make:

- cheating and unfair advantage
- harm
- the idea that doping perverts the nature of sport
- the contention that doping is dehumanizing

Generally speaking, these are the four clusters of arguments proposed to justify prohibiting substances in sport, and all of them have merit from an ethical standpoint.

Cheating and unfairness

It is sometimes argued that doping is prohibited because it is cheating or unfair. The problem with this position is that doping only becomes cheating once there is a rule prohibiting it. If there were no rules against doping, would doping be cheating?

Sometimes an alternative idea of fairness has been suggested that is independent of the rules of sport. This notion would have to show how doping was somehow inherently unfair, even if the contestants agreed to do it and even if the rules of the game permitted it. Due to its circular nature, it is not clear how an argument like this could succeed.

It is strongly defended by those against doping in sport that athletes have a fundamental right to compete on a level playing field without the use of performance-enhancing substances. Therefore, the cheating and unfairness argument can only be used in this context. It would then be considered unfair to bring all athletes, potentially against their will, to use all kinds of substances or methods in order to improve their performance.

Harm

It is widely recognized that sport itself is a risky enterprise and that many sports carry inherent risks of physical harm through injury. All sports, if pursued at the elite level, carry the risk of injuries caused by over-training or the sport itself. The problems are exacerbated in contact or violent sports. So, what is an appropriate or acceptable risk of harm? How many of those risks can be alleviated by proper equipment and other safety measures which are now integral parts of the rules of each sport? How many of those risks are unnecessary?

The argument falling under the category of harm comes in a variety of forms: harm to athletes who dope, harm to athletes who do not dope, and harm to society. Each will be explored separately in the following.

Doping can be harmful to athletes who dope

Since many prohibited substances or methods carry serious risks of harm to their users, doping adds unnecessary risks to sport. Good sport should not require that athletes undertake those unnecessary risks. Here the suggestion is that doping should be prohibited to protect athletes who dope or are tempted to dope.

While this argument can be viewed as paternalistic and inconsistent with other practices accepted in sport, possible responses to these criticisms include the argument that sport is entitled to defend its values, one of which is respect for participants, and therefore can seek to protect athletes against unnecessary harm. Also, it is not because sport carries other unnecessary risks that doping should be allowed. Perhaps a more logical approach would be to examine the other unsafe practices and see how they could be changed to make sport safer.

Doping harms athletes who do not dope

The athletes who dope ruin fair sport for athletes who do not dope. If clean athletes feel that other athletes are doping, they may feel the need to dope to catch up. This results in the dreadful situation where everyone ends up doping. The craziness of this situation is that doping is only an advantage to the cheat if others do not dope. If everyone dopes that advantage is lost, and athletes are back where they started – only now everyone dopes. The level-playing field can be attained either with no-one doping or with everyone doping.

The argument here is that doping is coercive; because doping may improve performance, there is coercive pressure placed on those who wish to compete without doping. If there are doped athletes, then athletes who do not dope are now forced to dope to keep up.

This approach has been criticized as incomplete because elite-level sport is already highly coercive. If full-time training, altitude training or diet control are shown to produce better results, then everyone is forced to adopt those measures to keep up. However, this position does not hold if the true meaning of sporting excellence and sporting contests is about testing skills, hard work and natural talent. In this case, doping becomes unnecessarily coercive, compared to, for example, extended training, which intends to improve one's skills for enhanced performance.

Doping harms society

Whether athletes like it or not, they are influential role models for young people. The behaviour and actions of elite athletes can have significant impact on young people as they admire and aspire to emulate their sporting heroes, especially their actions and attitudes. Doping sends an awful set of destructive messages. First, doping sends the message that it is acceptable to cheat to get ahead. Second, doping says that people can turn to a bottle or a pill for success. These messages are inconsistent with those that society is trying to instil in its youth; namely that it is wrong to cheat to get ahead, and there is no substitute for effort, commitment, dedication and skill. This is true in sport as much as in everyday life.

Sport has a special place in people's lives and in their communities. People commit vast amounts of their time, energy and effort to sport. Families and communities try to create sporting opportunities for young people that allow them to grow, learn and have fun. Doping undermines all of that effort and commitment. If people believe that sport is dirty, that they have to use a needle or take some pills to get ahead, then their love for sport will die. Communities do not just value sport; they value good sport – clean sport. All of those currently engaged in sport have a responsibility to ensure that good sporting opportunities are available for future generations.

The argument that doping harms society can find some detractors who say that it does not hold if doping is not prohibited in the first place. If rules allowed doping, then athletes would not be labelled as cheats for doing it. However, the use of substances by athletes to enhance their performance may very well become a way in which recreational drug use is normalised in the eyes of youth and may undermine all society's efforts to reduce drug use and abuse among its children. Society is justified in striving to remove the example set by doped athletes.

Perversion of Sport

This category of arguments includes everything that shows that doping harms sport. To engage in this kind of reflection requires one to question the motives of various groups involved in the sport enterprise. Why do people practice sport? Why do parents enrol their children in sport? Why do spectators enjoy watching sport? Why do volunteers and sponsors invest so much time and money in sport?

Without going into detail, once all those reasons are clarified, it is easy to see how doping can undermine the very reasons people are involved in sport in the first place:

- Doping can exclude people from sport and turn them off (clean athletes are discouraged by the idea of having to resort to doping to keep up; parents fear that their kids will have to put themselves through sticking needles and popping pills to stand a chance of winning).
- Doping can turn sport, a genuine contest, into a form of circus event where spectators are cynical towards sport performance and disinterested in the contest.
- Doping can bring the reputation of a sport into disrepute. (Volunteers and sponsors are no longer willing to associate their image with an activity that promotes values that they do not support.)

So in the end, if sport no longer meets the expectations of the people who are involved in it, participation rates drop, spectator attendance diminishes (along with ticket revenues), sponsorship potential decreases, etc. Doping harms sport and kills it slowly from within.

Unnaturalness and Dehumanization

This is a grand sounding claim that doping harms humanity, but there is an important point behind it. Doping treats athletes' bodies as things; things that can be controlled, altered, injected and manipulated to serve the ends of sport. This dehumanizes the athletes; it says that the bodies used in sport are less important than sport itself.

Here the argument is that doping should be prohibited because it is either unnatural or dehumanising. The unnaturalness argument is difficult for two reasons. The first is that there is no good account of what can be defined as 'unnatural.' The second is that it is inconsistent with the use of other performance-enhancing technologies which are permitted and are clearly not 'natural' (whether from equipment design, training apparatus and accessories, control of training environment, mental conditioning, or others).

Nevertheless, to use athletes' bodies as machines to be improved for sport performance gets the relationship backwards. Sport is for people; it is played by people; it brings joy to people. Doping turns bodies, turns people, into things to be used for sport. A sporting contest should be a contest between people – not machines. To treat people as machines is to take away the fundamental aspect of fun and joy in sport.

Why not just forget the anti-doping rules and allow doping?

It is sometimes suggested that it would be easier to just give up the fight against doping and allow athletes to take whatever they want. The arguments often offered by the proponents of this position are below, with counter arguments proposed as well:

1. ***This would be fair as the same rules would apply equally to everyone. After all, they are only hurting themselves…***

   But we have seen in previous sections how this is not true. Doping harms not only the doped athlete, but also the athletes who do not dope, sport, society, humanity. By allowing all athletes the freedom of choice in doping or not, we would be telling athletes who do not wish to become ambulant pharmacies that they will never have a fair chance at winning in sport. If doping is allowed in sport then public support for sport will decrease. People will see sport not as something good and worthwhile, and something young children can be encouraged to do, but rather as something that destroys young lives and bodies. Would you sign your own kids up in a sport system in which their only chance to perform would be to turn their bodies into machines and live with all the health consequences of doping, including the possibility of premature death?

2. ***By disallowing doping, you are forcing athletes to resort to underground tactics. Doping under strict medical supervision is not dangerous…***

   Side effects, health consequences and risks associated with the use of prohibited substances and methods are real. They are observable among patients who are using these substances and methods to treat medical conditions. Do you truly think that sports physicians would be able to turn these effects off for athletes? In addition, the distribution of many of the prohibited substances, if not for medically justified reasons, is illegal in many countries, and medical supervision of doping practices contravenes medical ethics and many professional codes of conduct. Medical practitioners have an ethical duty and a professional responsibility to promote and protect the health of an athlete and are subject to disciplinary action if they do not.

3. ***Doping regulations, testing procedures and whereabouts requirements are against the athlete's right to privacy…***

   Entering the world of competitive sport as an athlete comes with privileges and with responsibilities. Clean athletes, although inconvenienced by all the requirements surrounding doping control, are in favour of the procedures in place because they know that it is the only way to protect their right to a fair, doping-free contest. Athletes have been the driving force behind the foundation of WADA and have been part of every step of the consultation and decision-making process for the adoption of universal anti-doping rules. They understand that choosing the lifestyle of an athlete implies consenting to such testing procedures in order to be eligible for competition.

4. ***Dopers will never all be caught. So why expend all this effort and money on testing them only to catch a few?***

   The universal implementation of unannounced out-of-competition tests and stringent sanctions are likely to become excellent deterrents for those who are tempted by doping, but it is quite possible that some cheaters will get away. However, what kind of sport would we create if we allowed doping on the basis of that argument? Consider this as a parallel: what kind of civilization would we live in if the police and justice system decided to simply abandon their fight against crime based on the sole argument that they will never be able to catch all criminals anyway?

Health Consequences of Doping

As mentioned, it is very difficult to determine the exact side effects that a substance or a method or combination thereof may have on an athlete who is doping. This is partly because:

- The relevant studies cannot be conducted on individuals without a therapeutic reason to do so;
  The substances or methods used by doping athletes are usually developed for patients with well-defined disease conditions and are not intended for use by healthy people;
- Volunteers in a therapeutic study are unlikely to be subjected to the same conditions of administration and dosage of a substance and/or method as those of an athlete who is doping;
- Athletes who use prohibited substances often take them in significantly larger doses, and more frequently, than these substances would be prescribed for therapeutic purposes, and often use them in combination with other substances;
- Substances that are sold to athletes as performance enhancers are often manufactured illegally and may therefore contain impurities or additives, which can cause serious health problems or may even be fatal.

Given that the many combinations and/or doses of performance enhancing substances used by doping athletes have never undergone official trials, for an athlete to acquiesce to doping is to accept being a guinea pig and to risk adverse effects of unknown nature and unknown gravity. The adverse effects outlined in this document are likely to be the very least of those that may be expected. The actual adverse effects and side effects of using large doses and drugs in combination with others are likely to be much more severe and serious. Using combinations of several drugs means not only adding to but also compounding the risks.

Since hormones play multiple roles in the human organism's regulatory functions, the non-therapeutic use of any type of hormone risks creating an imbalance that affects several functions, and not only the function that is usually directly concerned by the given hormone.

Additional health risks are present when the use of substances or methods involves injections. Non-sterile injection techniques, including sharing possibly contaminated needles, can increase the risk of transmission of infectious diseases such as hepatitis and HIV/AIDS.

Finally, use of any substance may also lead to addiction, whether psychological or physiological.

Effects of Some Prohibited Substances and Methods

The following section will outline the possible health consequences and perceived sport benefits to using certain groups of doping substances.

Alcohol

Prohibited in-competition in some sports, alcohol is a central nervous system depressant, which slows down the actions of the brain and body. It can reduce tension, inhibition and self-control, which may result in athletes taking risks that they would not normally take, placing both them and others at risk. Continued alcohol consumption can lead to the following health consequences:

- **vomiting**
- **slurred speech**
- **double vision**
- **memory and comprehension loss**
- **liver damage**
- **impaired judgement, coordination and reactions**
- **incontinence**
- **sleepiness**
- **shallow breathing**
- **sexual disorders**
- **addiction**

Anabolic androgenic steroids

Anabolic androgenic steroids are natural or artificial versions of the hormone testosterone. Testosterone is a male sex hormone that is found in large amounts in males and in smaller amounts in females. Testosterone is responsible for stimulating the development of the male reproductive system and the secondary male sexual characteristics such as hairiness and deep voice, and the accelerated growth of muscle and bone. Anabolic steroids have been used medically to treat patients who suffer from deficiencies in the naturally occurring male sex hormone testosterone, for the treatment of delayed puberty, some types of impotence and breast cancer, as well as to treat body wasting caused by HIV/AIDS or other diseases.

The use of anabolic androgenic steroids can have serious effects on a person's health. The list of potential side effects is long and varied, but may include:

- **increased risk of liver disease**
- **increased risk of cardiovascular disease**
- **increased risk of contracting infectious diseases such as hepatitis and HIV/AIDS**
- **high blood pressure**
- **psychological dependence**

In addition, the following side effects may be found in males:

- **acne**
- **shrinking of the testicles**
- **reduced sperm production**
- **impotence**
- **infertility**
- **enlarged prostate gland**
- **breast enlargement**
- **premature baldness**
- **potential kidney and liver dysfunction**
- **increased aggression and mood swings**
- **libido disorders**

The following side effects may be found in females:

- **acne**
- **development of male features**
- **deepening of the voice**
- **excessive hair growth on the face and body**
- **abnormal menstrual cycles**
- **enlarged clitoris**
- **increased aggression and mood swings**
- **foetal damage**
- **alteration of libido**

Artificial oxygen carriers

Artificial oxygen carriers are chemicals used to increase the ability to carry extra oxygen in the blood. Examples of artificial oxygen carriers include perfluorocarbons (PFCs) and haemoglobin based oxygen carriers (HBOCs). Artificial oxygen carriers are of potential use when human blood is not available, the risk of blood infection is high or when time is too short to properly cross-match the blood of a donor with that of a recipient. Most of these types of products are still undergoing clinical trials, or are available for veterinary use only.

Side effects associated with the use of perfluorocarbons include:

- **a transient fever**
- **reduction in platelet count**
- **blood infection (if preparations are impure)**
- **potential overloading of the white blood cells**
- **embolism (blocked blood vessel)**
- **irritability**
- **diarrhea**
- **stroke**

Possible side effects of haemoglobin based oxygen carriers include:

- **high blood pressure**
- **vasoconstriction (constriction of the blood vessels)**
- **kidney damage**
- **iron overload**

Beta blockers

Beta blockers are substances that decrease the output of blood from the heart. They are used to reduce heart rate, reduce blood pressure and help prevent dilation of the blood vessels. They are used in the management of cardiovascular disorders such as high blood pressure, angina and heart disease. They may also be used in the treatment of migraines and to reduce symptoms of anxiety. The use of beta blockers could be beneficial to athletes in precision sports, such as shooting and archery, as they can reduce heart rate and reduce tremors. Side effects of using beta blockers include:

- **lowered blood pressure and slow heart rate**
- **constriction of blood vessels in the arms and legs**
- **sexual dysfunction**
- **feelings of tiredness and decreased performance capacity in endurance activities**
- **spasm of the airways**
- **heart failure**
- **sleep disorders**

Beta-2 Agonists

These drugs are commonly used to treat asthma, bronchoconstriction and pulmonary disease, by managing the reversible airway obstruction. Beta-2 Agonists can also be used during premature labour to delay childbirth. They may have effects similar to the use of anabolic agents when used orally or injected, allowing athletes to increase muscle mass, reduce body fat and recover more quickly. Possible side effects include:

- **palpitations**
- **headaches**
- **nausea**
- **sweating**
- **muscle cramps**
- **dizziness**
- **mood disorders**
- **possible increase in morbidity in those using long-acting Beta-2Agonists**

Blood doping

Blood doping is the administration of blood or blood-related products in order to increase the number of red blood cells in the body, thereby increasing the delivery of oxygen to muscles and enhancing athletic performance. It may involve the use of blood previously withdrawn from the same person or from another person. Medically, red blood cells are administered for the treatment of severe anaemia or blood loss following surgery or severe injury. Blood doping carries dangerous health risks including:

- **jaundice**
- **circulatory overload**
- **increased risk of contracting infectious diseases such as hepatitis and HIV/AIDS (if using shared needles)**
- **septicemia (blood poisoning)**
- **blood clots, stroke or heart failure**
- **metabolic shock**
- **allergic reactions (ranging from rash or fever to kidney damage) if wrong blood type is used**

Cannabinoids

Cannabinoids are the psychoactive chemicals in the cannabis plant. The most active cannabinoid in cannabis is tetrahydrocannabinol (THC), of which the greatest concentrations are found in the flowering tops and leaves of hemp plants. Cannabinoids can be found in the form of different preparations from different parts of the cannabis plant, and bear different names such as marijuana, pot, hashish, resin, oil, etc. **(See *Is Cannabis Really Performance Enhancing?*, page 89)** Potential therapeutic uses of cannabinoids are still being investigated and include analgesia, the prevention of nausea associated with chemotherapy, and muscle relaxation.

Effects of cannabinoids may include:

- **loss of perception of time and space**
- **drowsiness and hallucinations**
- **reduced vigilance, balance and co-ordination**
- **loss of concentration**
- **increased heart rate**
- **increased appetite**
- **mood instability – rapid changes from euphoria to depression**

long-term marijuana use may result in:

- **loss of attention and motivation**
- **impaired memory and learning abilities**
- **possible weakening of the immune system**
- **respiratory diseases such as lung and throat cancer and chronic bronchitis**
- **psychological dependence**

Corticotrophins

Corticotrophin (adrenocorticotrophion – ACTH) is a naturally occurring hormone that is produced by the pituitary gland to stimulate the secretion of corticosteroids. It has been used medically as a diagnostic tool for malfunctions of the adrenal glands and in the treatment of certain neurological disorders such as infantile spasm and multiple sclerosis.

The short-term side effects of ACTH use include:

- **stomach irritation**
- **ulcers**
- **irritability**
- **infections**

Other side effects may include:

- **softening of the connective tissue**
- **high blood sugar (hyperglycaemia)**
- **reduced resistance to infections**
- **weakening of an injured area in muscles, bones, tendons or ligaments**
- **osteoporosis**
- **cataracts**
- **water retention**

Diuretics

Diuretics are agents that help to eliminate fluid and minerals from the body by increasing the production or affecting the composition of urine. They stimulate the kidneys to increase the amount of urine produced to eliminate excess water and electrolytes from the body. Diuretics are used to treat high blood pressure, heart failure, and disease of the kidney. They can help to reduce tissue swelling that is caused by fluid retention. Diuretics may be used by athletes to mask the use of other prohibited substances, such as steroids. They may also be used by athletes to meet weight requirements for sports such as weightlifting, boxing, or judo.

Some side effects include:

- **dizziness or even fainting**
- **dehydration**
- **muscle cramps**
- **drop in blood pressure**
- **loss of co-ordination and balance**
- **confusion, mental changes or moodiness**
- **cardiac disorders**

Erythropoietin (EPO)

EPO is a hormone produced by the kidneys that stimulates the production of red blood cells. In medical practice, a synthetic form of EPO is used to treat patients suffering from the anaemia that can be associated with chronic renal failure. From a sport perspective, EPO delivers more oxygen to the muscles, and therefore enhances the athlete's endurance.

Some of the serious health risks associated with the use of EPO include:

- **thickened blood**
- **increased risk of blood clots, stroke and heart attacks**
- **increased risk of contracting infectious diseases such as hepatitis and HIV/AIDS (from needles)**
- **risk of developing, as an autoimmune reaction, EPO antibodies that can definitively destroy the EPO that is produced naturally by the body**

Gene doping

Gene doping is the non-therapeutic use of genes, genetic elements and/or cells that have the capacity to enhance athletic performance. For instance, synthetic genes or genetically modified cells are introduced into the body in order to produce a factor or induce a response, which will improve performance. The uses of gene transfer are still in the early stages of research. It is intended that gene transfer will permit replacing or altering missing, damaged or diseased genes in patients with serious illnesses. Since most gene transfer technologies are still in experimental phases, the long-term effects of altering the body's genetic material are unknown, although several deaths have already occurred during experimentation.

Some of the potential side effects of gene doping are:

- **cancer development**
- **allergy**
- **metabolic deregulations**

(See *Gene Doping*, page 57)

Glucocorticosteroids

These are substances produced by the adrenal gland that are able to regulate numerous functions in the body and in particular, inflammation. When administered systematically (into the blood), they can produce a feeling of euphoria. Gulucocorticosteroids are the most powerful anti-inflammatory agents available in medicine and are used in the treatment of numerous non-infectious diseases that are characterised by pathologically inappropriate immune or inflammatory reactions. They also relieve pain. They are commonly used to treat asthma, hay fever, tissue inflammation and rheumatoid arthritis. When administered into the blood stream, glucocorticosteroids have numerous side effects involving different body systems.

Possible side effects of large doses of glucocorticosteroids include:

- **fluid retention**
- **increased susceptibility to infection**
- **osteoporosis (abnormal loss of bone tissue resulting in fragile porous bones)**
- **weakening of injured areas in muscle, bone, tendon or ligament**
- **disorders of the nervous system, such as convulsions and muscle cramps**
- **decrease in or cessation of growth in young people**
- **loss of muscle mass**
- **heartburn, regurgitation and gastric ulcers**
- **softening of connective tissue (such as tendons and ligaments)**
- **alteration to the walls of blood vessels, which could result in formation of blood clots**
- **psychiatric disorders, such as changes in mood and insomnia**

Gonadotropins

These hormones include luteinizing hormone (LH) produced by the pituitary gland, and human chorionic gonadotrophin (hCG) produced by the placenta during pregnancy. They stimulate the functioning of the testes and ovaries as well as the production of hormones in both males and females. Medically, gonadotrophins are used in the treatment of fertility disorders in both women and men as well as in cases of non-descended testes and in the treatment of delayed puberty. As hCG stimulates the production of testosterone, the side effects can be similar to those experienced from anabolic steroid use.

Other side effects of gonadotropins use include:

- **bone and joint pain**
- **hot flushes**
- **decrease in libido**
- **impotence**
- **allergic reactions and rash**
- **nausea, dizziness**
- **headaches**
- **irritability**
- **gastrointestinal problems**
- **irregular heart beats**
- **shortness of breath**
- **loss of appetite**
- **depression**
- **tiredness**

Growth hormone and insulin-like growth factors

Human growth hormone (hGH) is a hormone produced by the pituitary gland below the brain, which has the potential to stimulate growth. The majority of the growth-promoting effects of hGH are mediated by insulin-like growth factor-1 (IGF-1), a hormone secreted by the liver and other tissues in response to hGH. hGH and IGF-1 are necessary for the normal growth of children and the maintenance of normal body composition and metabolism in adults. Medically, hGH is used to treat children whose pituitary gland does not produce enough growth hormone to allow normal growth to occur. Since 1989, it has been shown to be effective in treating adults with growth hormone deficiency, a severe medical condition. An athlete, however, may use hGH to increase muscle-mass.

There are dangerous side-effects related to the use of these substances, including:

- **tremors, sweat, anxiety**
- **worsening of cardiovascular diseases**
- **increasing development of tumours**
- **cardiomegaly (abnormal enlargement of the heart)**
- **accelerated osteoarthritis (chronic breakdown of cartilage in the joints)**

- **acromegaly in adults (distorted growth of internal organs, bones and facial features and the enlargement and thickening of fingers, toes, ears and skin)**
- **muscle, joint and bone pain**
- **hypertension**
- **fluid retention**
- **diabetes in individuals who may already be prone to the disease**
- **gigantism in young people (excessive growth of the skeleton)**

Insulin

A hormone produced by the pancreas and involved in the regulation of blood sugar levels, insulin acts on the metabolism of carbohydrates, fats and proteins. Medically, insulin is used in the management of diabetes. The side effects of insulin use for non-medical purposes are severe and include low blood sugar (hypoglycemia), which in turn may cause:

- **hypoglycemic tremors**
- **nausea**
- **weakness**
- **shortness of breath**
- **drowsiness**
- **pancreatic disease**
- **coma**
- **brain damage and death**

Narcotics

Narcotics act on the brain and spinal cord to reduce feelings of pain. Narcotics hold a variety of uses in medicine, including pain relief, as sedatives, or to treat coughs or respiratory distress in terminally ill patients. The use of narcotics to reduce or eliminate pain can be dangerous as the substance is merely hiding the pain. With the false sense of security caused by narcotics, the user may ignore a potentially serious injury, and continue activity, risking further damage or causing permanent damage. Apart from the risk of further or permanent damage, narcotics can have other dangerous side effects, such as:

- **slowed breathing rate**
- **decreased heart rate**
- **sleepiness**
- **loss of balance, co-ordination and concentration**
- **euphoria**
- **nausea and vomiting**
- **constipation**
- **physical and psychological dependence, leading to addiction**
- **suppression of the respiratory system and death**

Stimulants

These are substances that act on the central nervous system to stimulate the body both mentally and/or physically; examples of stimulants are amphetamines, cocaine, ecstasy, ephedrine and pseudoephedrine. Stimulants have many and varied uses in conventional medicine. They are used for conditions affecting the cardiovascular system, such as shock, heart attack, slow heart rate (bradycardia), loss of blood pressure and stopping minor bleeding. Stimulants are also used to treat respiratory disorders, nasal congestion and the common cold. Other stimulants are used in the management of narcolepsy (excessive daytime sleepiness) and the management of attention deficit hyperactivity disorder (ADHD). Athletes may use stimulants to improve endurance, reduce fatigue and increase aggressiveness. Those trying to qualify for a lower weight class may use stimulants to suppress appetite.

The use of certain stimulants can cause serious cardiovascular and psychological problems, as well as various other side effects, such as:

- **overheating of the body**
- **dry mouth**
- **increased and irregular heart rate**
- **increased blood pressure**
- **dehydration**
- **increased risk of stroke, cardiac arrhythmia and heart attack**
- **insomnia**
- **anxiety and aggression**
- **weight loss**
- **problems with co-ordination and balance**
- **tremors (involuntary trembling or shaking)**
- **possible dependence and addiction**

Sanctions

The sanction for an anti-doping rule violation (ADRV) depends on the type of violation, the circumstances of the case, which substance the athlete took, and whether this was a first time or repeat violation.

In-Competition Test/During an Event

An ADRV in individual sports in connection with an in-competition test automatically leads to disqualification of the results obtained in that competition with all resulting consequences of this, including forfeiture of any medals, points and/or prizes. During an event, where an individual takes part in several disciplines or races, the athlete may automatically be disqualified from the event or simply the competition (discipline/race) associated with the in-competition test.

Sanctions on Individuals

A major difference between the original Code (2003 Code) and the 2009 Code was an increase in sanctions and also allowing Anti-Doping Organisations (ADOs) more flexibility in applying sanctions. While this flexibility provided for enhanced sanctions, for example in cases involving aggravating circumstances, lessened sanctions were possible where the athlete could establish that the substance involved was not taken with the intention of enhancing performance.

Further changes to sanctions were made to the 2015 Code, following suggestions made by stakeholders during the 2015 Code review process, including increasing the period of ineligibility from two to four years for all intentional doping. During the consultation phase, athletes called for a longer period of ineligibility for intentional cheats, whilst maintaining flexibility for inadvertent, unintentional doping. Athletes were clear in their message: longer sanctions – which would include an athlete missing an Olympic Games – will act as a greater deterrent. For presence, use or possession of a non-specified substance, the period of ineligibility is now four years, unless the athlete can establish that the violation was not intentional. The period of ineligibility for an athlete found to have no significant fault for an Adverse Analytical Finding (AAF) involving a 'specified substance' or a contaminated product may range from a reprimand to a two-year suspension.

A sanction may also be reduced, eliminated or have a period of ineligibility suspended in cases where the individual sanctioned provides substantial assistance in discovering or establishing an Anti-Doping Rule Violation (ADRV). Consideration of a reduction of ineligibility can also be taken into account in circumstances where there is a prompt admission of an ADRV or where there is an admission in the absence of other evidence.

Multiple ADRVs

As with first violations, the period of ineligibility for a second ADRV depends on the circumstance of both the first violation and the second. Each ADRV must take place within the same ten-year period in order to be considered a multiple ADRV. A third ADRV will always result in a lifetime period of ineligibility, except when the third violation fulfils the condition for elimination or reduction of the period of ineligibility or is the result of a Whereabouts Failure. In these particular cases, the period of ineligibility shall be from eight years to a lifetime.

For a second ADRV, Article 10.7.1 of the Code stipulates that the period of ineligibility shall be the greater of:

a. six months

b. one-half of the period of ineligibility imposed for the first ADRV without taking into account any reduction

c. twice the period of ineligibility otherwise applicable to the second ADRV treated as if it were the first violation without taking into account any reduction

Team Sports

If more than two members of a team in a team sport are found to have committed an ADRV during an event period, the ruling body of the event shall impose an appropriate sanction on the team (e.g., loss of points, disqualification from a competition or event, or other sanction), in addition to any consequences imposed on the individual athletes who committed the ADRV.

SUPPLEMENTARY INFORMATION

Is Cannabis Really Performance Enhancing?

One of the most debated substances on the Prohibited List is cannabis. Prior to 2004, when the International Olympic Committee (IOC) was responsible for the Prohibited List, cannabinoids were prohibited only in certain sports. International Federations were left to decide whether to prohibit cannabinoids in their sports. During the second World Conference on Doping in Sport, held in Copenhagen in 2003, delegates arguing for the inclusion of cannabinoids on the Prohibited List cited potential for performance enhancement, legal status in most countries and the view of athletes as role models, while those opposed to the inclusion argued that cannabis was not performance enhancing and therefore a social issue, not a sport issue. In 2004, when the World Anti-Doping Agency (WADA) assumed responsibility for the Prohibited List, the prohibition of cannabinoids was extended to all sports in-competition. While this was viewed as an acceptable compromise, the issue continues to be debated.

A substance can be included on the Prohibited List if it meets two of the following three criteria:

- There is medical or other scientific evidence, pharmacological effect or experience that the substance has the potential to enhance sport performance.
- There is medical or other scientific evidence, pharmacological effect or experience that the use of the substance represents an actual or potential risk to the athlete's health.
- The determination that the use of the substance violates the spirit of sport as described in the introduction to the World Anti-Doping Code (Code).

How does this relate to cannabinoids? The health consequences of cannabis use, as previously outlined, may not be highly debated. **(See *Health Consequences of Doping*, page 76)**.

In general, the most difficult of the criteria to prove is how the substance violates the spirit of sport, since it relies on ethical and societal considerations that are more difficult to measure than health consequences or physical benefits. Consumption of an illegal drug is considered a contradiction to the spirit of sport. Given that cannabis is illegal in most parts of the world, it could therefore be in violation of the spirit of

sport. Furthermore, as argued during the second World Conference on Doping in Sport, the role of athletes as role models is also seen to be incompatible with use or abuse of cannabis. The treatment of American swimmer, Michael Phelps, after pictures of him inhaling from marijuana pipe surfaced in 2008, further demonstrated this view. Although he was not sanctioned for an anti-doping rule violation since he had not tested positive for the substance in-competition, Phelps was suspended for three months by his national federation and dropped by a sponsor.

In a review of scientific data, Huestis *et al*. (2011) outlined the possible documented performance enhancing properties of the use of cannabinoids.

These included :

– **decreased anxiety, fear, depression, tension and stress**
– **increased impulsive responses leading to more risk-taking**
– **increased relaxation**
– **promotes better sleep**
– **reduces pain**
– **improves self-confidence**
– **aids in forgetting negative events or traumas such as bad falls**
– **decreases respiratory rate and increases heart rate**
– **increased bronchodilation could improve oxygenation to the tissues**
– **improvement of vision, concentration and focus**
– **muscle relaxation and reduced muscle spasm**
– **increases appetite resulting in increased caloric intake and body mass**
– **enhances sensory perception**

In a study of 1,152 students from six sport sciences universities in the South of France, Lorente *et al* (2005) sought to ascertain whether cannabis could be used for managing anxiety before a competition in order to increase efficiency. The authors' findings revealed that 36% of cannabis users did so to relax, forget about problems, lower stress and to sleep better, supports the view that the relaxing properties of cannabis could be used to enhance performance. They also found that the reported use of cannabis for performance enhancement was higher in sliding sports. In a survey of over 20,000 student-athletes in the National Collegiate Athletic Association (NCAA) in the United States, nearly 23% of respondents indicated using marijuana in the previous 12 months, with 9.4% having reported using both during the competition season and the off season. Of the 68 cannabinoid positives in Canada between 2006 and 2012, 25 samples were collected from student-athletes.

At its May 2013 meeting, WADA's Executive Committee decided to increase the threshold level for cannabis following consideration of the many submissions received from stakeholders during the Code review process. This means that as of 11 May 2013, cannabis cases will only be pursued where the reported concentration is at the new decision limit of 175 ng/mL or higher.

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Supplements

Many athletes believe that the demands of competing at an elite level require the use of dietary or nutritional supplements. While the IOC's Nutrition Working Group would agree that an athlete with a demonstrated deficiency of an essential vitamin or mineral may benefit from the use of supplements where it is not possible to consume enough food to compensate for the deficiency, the use of supplements does not compensate for poor food choices or an inadequate diet. (IOC, 2003)

Industry claims

A major concern with the supplement industry is that it does not have to follow the same good manufacturing practices (GMP) as pharmaceuticals, and manufacturers are not required to display the entire ingredient list on the packaging of substances. Many supplements that are advertised as muscle builders and fat burners are known to contain a prohibited substance. Those that claim to increase energy, including those that claim to be natural or herbal, are not likely to improve performance and are not supported by research. Although most supplement manufacturers claim that their products are backed by valid scientific research, this is not the case. Furthermore, there is no strong scientific evidence to support the claims that supplements such as glutamine, zinc, Echinacea, and colostrum, can boost the immune system.

Risks associated with the use of supplements

These poor GMP and labelling practices can put an athlete subject to doping control at risk of committing an anti-doping rule violation (ADRV). While the risk may be higher with supplements sold on the black market or on the Internet, those sold in shops labelled herbal or natural may also be contaminated.

Due to the principle of strict liability in the World Anti-Doping Code (Code), an athlete committing an ADRV associated with the consumption of a contaminated supplement, whether it is due to poor labelling or contamination during the manufacturing process, is responsible and will be sanctioned. **(See *Strict Liability*, page 18)** While this sanction may be reduced if the athlete can prove that the adverse analytical finding (AAF) was due to the use of a poorly labelled or contaminated supplement, the athlete is not dissolved of all responsibility.

The contamination of substances and the lack of scientific research can also put the health of those consuming supplements at risk.

Reducing the risk

The World Anti-Doping Agency (WADA) hosted symposia held in Montreal (Canada) in 2004 and in Leipzig (Germany) in 2005, to discuss the use of supplements in sport. Both gathered leading experts from sport, the anti-doping community, medical and scientific fields, supplement industry, governments, athletes and coaches to find ways and means of reducing the risk of supplement use by athletes.

The outcomes of both events suggested that the supplement industry itself had to take responsibility for self-regulation, with the goal of improving quality of products, minimizing contamination, ensuring accurate labelling and demonstrating a commitment to and support for testing and certification programmes. However, governments also have a key role to play. It was determined that since the marketing of contaminated supplements was an issue of public health and consumer protection, governments are critical to ensuring that the supplement industry is more tightly regulated. Furthermore, governments that have ratified the UNESCO International Convention against Doping in Sport (Convention) "where appropriate, shall encourage producers and distributors of nutritional supplements to establish best practices in the marketing and distribution of nutritional supplements, including information regarding their analytical composition and quality assurance" (Article 10 – Nutritional Supplements of the UNESCO Convention).

What can athletes do?

Knowing that many athletes will continue to use supplements, many anti-doping organisations (ADOs) have taken steps to help athletes reduce the risks associated with the use of supplements. For example, some ADOs have worked with third party testing organisations to have batches of supplements tested and have shared this information, including batch numbers, with athletes, always reminding them that these products are simply 'lower risk' and that ultimately they are responsible for any substance that they use.

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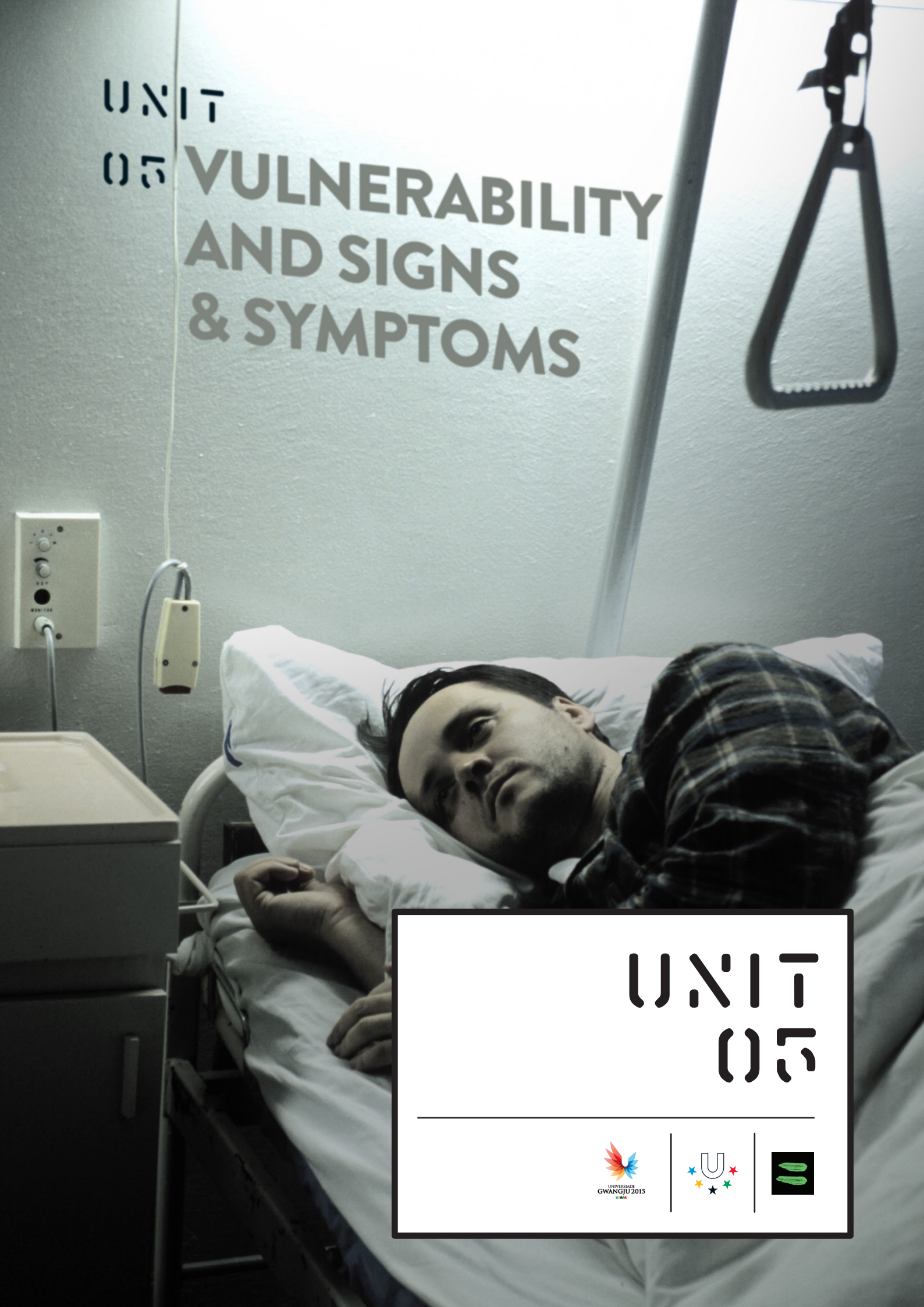
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VULNERABILITY
AND SIGNS
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Vulnerability

Understanding the personality traits or situations that could make an athlete more vulnerable to engaging in doping behaviours can allow those working with these athletes to access education programmes based on their particular needs or provide psychological support.

Personality traits

Researchers have identified personality traits and characteristics that can put athletes at a higher risk of engaging in doping behaviours. Displaying these characteristics does not guarantee that an athlete will engage in doping; however, identifying these traits can be used to help those working with athletes identify potential risks. Some of these traits and characteristics include:

- **low self-esteem**
- **results-driven/perfectionist tendencies**
- **body image dissatisfaction / concern about weight maintenance**
- **unruly, disrespectful of authority**
- **high ego orientation/low task orientation**
- **impatience with obtaining results**
- **propensity for cheating/bending the rules**
- **willingness to use prohibited methods or substances if they were legal**
- **willingness to use prohibited methods or substances if they could ensure success**
- **in sports**
- **belief that everyone else is doping**
- **disbelief in harmful effects of doping**
- **history of substance abuse in family**
- **admiration for achievements of known doped athletes**
- **thrill-seeking**

At-risk behaviours

Athletes who engage in other at-risk behaviours are also more susceptible to engage in doping. Some of these behaviours could include:

- **use of other substances, alcohol or tobacco**
- **non-discretionary use of dietary supplements**
- **relying on untrustworthy or misinformed sources**
- **frequenting fitness centres where steroids can be obtained**
- **setting unrealistic goals**
- **self-medicating**
- **frequent reading of muscle/fitness magazines**

Career changes

Other athletes, who are otherwise well intentioned and not necessarily prone to doping, may find themselves in situations that make them more vulnerable to succumbing to the temptation.

These include:

- **external pressures to perform/high stake placed on performance (by sponsors, agents, family members, sports organisations, etc.)**
- **overtraining or insufficient recovery time**
- **recovering from injury**
- **absence or weakness of deterrents (such as doping controls, severe sanctions, etc.)**
- **type of sport (weight categories; endurance; pure speed or strength)**
- **lack of resources (access to competent training professionals and sports training information and technology)**
- **degradation of personal relationships (with parents, peers, etc.)**
- **emotional instability caused by life transitions (puberty, graduation to higher education levels, dropping out of school, geographical moves, severed relationships, death of significant others, etc.)**
- **upcoming career-determining events (team selection, major competition, scouting or recruitment activities, etc.)**
- **performance set back or plateau**

Signs and Symptoms

Just as there are behaviours and traits to look for that indicate an athlete is more at risk of doping, there are also physical and psycho-emotional signs that an athlete may have engaged in doping behaviour.

Athletes using anabolic steroids may show one or several of the following:

- **quick weight gain**
- **acne**
- **hair loss**
- **becoming more masculine (for females) such as body hair growth and deepening of voice**
- **development of abnormally sized breasts (males)**
- **evidence of injections (needle marks)**

Athletes using or abusing certain drugs may show one or several of the following:

- **mood swings**
- **aggressive behaviour**
- **sudden increase in training regime**
- **signs of depression**
- **difficulty concentrating**
- **difficulty sleeping**
- **quick weight gain or loss**

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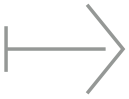
Preventing Doping



Previous units have explored the fight against doping in sport through testing, investigations, and programmes like Whereabouts and the Athlete Biological Passport (ABP); however, education and prevention have an essential role to play.

The 2015 World Anti-Doping Code (Code) made the provision of information and education programmes mandatory for all signatories. The basic principle for information and education programmes for doping-free sport is to preserve the spirit of sport from being undermined by doping. The primary goal of such programmes is prevention. The objective shall be to prevent the intentional or unintentional use by athletes of prohibited substances and methods. All signatories shall within their means and scope of responsibility and in cooperation with each other, plan, implement, evaluate and monitor information and education programmes for doping-free sport.

The Code outlines that programmes should, within the means of Anti-Doping Organisations (ADOs), provide athletes and their support personnel with updated and accurate information on at least the following issues:

- **substances and methods on the Prohibited List**
- **anti-doping rule violations**
- **consequences of doping, including sanctions, health and social consequences**
- **doping control procedures**
- **athlete and athlete support personnel rights and responsibilities**
- **therapeutic Use Exemptions (TUEs)**
- **managing the risks of nutritional supplements**
- **harm of doping to the spirit of sport**

The outcomes collected through WADA's social science research grant programme are used to help provide guidance to WADA and its stakeholders in the development of anti-doping education programmes. These conclusions help guide why it is important to provide anti-doping education or doping prevention programmes, whom to target, what to include, as well as where, when and how to deliver these programmes.

Why anti-doping education and doping prevention?

Why should ADOs engage in anti-doping education or doping prevention? Are detection and deterrence not enough?

Research has shown that there is a correlation between level of knowledge and doping attitudes/behaviours, meaning that the more educated about anti-doping athletes are, the more negative their attitudes to doping are. Further, many athletes who have never had any anti-doping education can display positive attitudes towards doping. Thereis a clear need for education programmes to instil values that support doping-free sport (Wedman, 2009).

Elite athletes name morals, ethics and conscience as the greatest deterring factors against doping (Moran, 2008). In some areas of the world, the lack of education makes athletes easier targets for doping by third parties (Kiawi, 2007).

To whom should education programmes be targeted?

While 'the athlete' seems to be the most obvious answer to this question, how do we define an athlete?

Projects funded by WADA's Social Science Research Programme have allowed for a fairly clear psychological profile of the high risk athlete: high ego - low task orientated athletes as well as perfectionists are at a higher risk of doping than high task – low ego athletes (Sas-Nowosielski, 2006; Skinner, 2012; Tsorbatzoudis, 2009; Vajiala, 2009). Although it appears that males are more prone to doping than females, more research in this area is needed (Weaving, 2009). Another target group that needs more attention is sanctioned athletes (Moran, 2008). Given that some sports and disciplines are at greater risk, particularly pure strength or endurance sports, extra education efforts and activities should be offered to athletes of these sports (Bilard, 2007).

Research suggests that education programmes have to be extended to many more target groups, including: coaches, doctors, the media, peers, parents, managers, sport psychologists, directors, and other support staff (Backhouse, 2006; Backhouse, 2009; Ohl, 2009). Coaches need to be provided with both information and education, as they are who athletes mostly turn to for advice about anti-doping (Bhambhani, 2009). Also, the motivational climate, which is often partly created by the coach, can be an important factor in the decision-making process (Wedman, 2009). It was shown that a strong anti-doping position from the coach acted as a strong deterrent (Gilley, 2008; Wedman, 2009). Athletes also turn to their doctors with questions about doping and anti-doping. There is, however, evidence suggesting that medical doctors have very little anti-doping knowledge (Dikic, 2008). Athletes get information from the media, but the reliability of the information is uncertain (Backhouse, 2006; Backhouse, 2009; Chester, 2007). It has also been shown that parents can be involved in the fight against doping, as they are indeed a stable agent throughout the career of the athlete and can provide constant and consistent messages (Dodge, 2011).

In conclusion, it appears that athletes at high risk of engaging in doping behaviour display recognisable characteristics. Anti-doping education efforts should not simply focus on athletes; coaches, doctors, parents and the media should also be targeted.

What content should be included in anti-doping education programmes?

There seem to be four main areas that are necessary ingredients for effective prevention programmes if used all together; namely: factual information, values-based education, health consequences and ethical considerations. However, it should be noted that information programmes are better suited to elite athletes or athletes to whom the technical aspect of anti-doping applies. These athletes will likely only retain or be open to knowledge that relates to them directly. Knowledge in and of itself is not enough to change behaviours and can even be counterproductive (Backhouse, 2006; Backhouse, 2009; Corbella, 2008).

Anti-doping education can be defined as activities that foster anti-doping values and develop anti-doping behaviours. These activities should be targeted primarily at youth, because the decision to dope or not to dope has not yet been made, and their attitudes are still forming (Backhouse, 2006; Backhouse, 2009; Rees, 2007).

Given the complexities related to health consequences of doping, WADA launched a target research programme to determine whether knowledge of the negative health consequences of doping changes behaviour and/or prevents the use of performance-enhancing substances. As mentioned above, current research suggests that it is important to include health consequences as part of an education programme (Backhouse, 2006; Backhouse, 2009), but presentation of the negative health consequences of doping should not be presented in isolation for certain age groups. Long-term health considerations appear not to have an impact on the decision-making process. This is also true given that, for certain sports, doping is used to protect the body against the negative health consequences of intensive training (Ohl, 2009).

The ethical considerations of doping are essential for anti-doping education. Athletes see the moral and ethical aspect of doping as one of the strongest reasons not to dope (Moran, 2008). A recent research project has provided evidence that an ethical anti-doping online training was more effective than a knowledge only anti-doping training (Batterham 2009).

In conclusion, information, education, health consequences, and ethical considerations should be included in anti-doping prevention programmes.

When is the ideal time to provide anti-doping education?

Some critical moments of vulnerability have been identified and should be seen as moments where particular care should be taken in ensuring that athletes are provided with anti-doping education. These include return from injury, change in clubs/environment, change in level (entering a high performance centre, entering the elite level), having just failed a competitive endeavour. While anti-doping education should be an on-going process and not limited to these periods, these are the moments the risk is greatest. On a broader scale, it is very important to provide anti-doping education to younger athletes before they fall within the "elite" category (Bondarev, 2008).

In conclusion, researchers have identified moments when athletes can be particularly at risk; however, education should not be limited to these moments. Youth populations should be a primary focus.

Where should anti-doping education take place?

Research suggests that the location where anti-doping education is provided has some importance. These locations include events, schools, clubs, home, the Internet and training centres (Backhouse, 2006; Backhouse, 2009; Fung, 2008).

Some areas of the world, such as New Zealand and Australia, seem to consistently show better scores on questions concerning knowledge of anti-doping (Wedman, 2009). Other areas of the world, particularly Africa, are in need of anti-doping education programmes (Kiawi, 2007).

In conclusion, there are strategic places to hold anti-doping education activities.

How?

The question 'how' applies to the techniques for educating and the research methodology, answering the question, how do we know what we know?

In order to increase effectiveness, programmes have to be tailored to the target population, be interactive, focus on developing core life-skills (particularly decision-making), be long-term commitments with regular 'booster sessions' and be multi-modal (e.g. offered and reinforcing learning within the school, community and family environments)(Backhouse, 2006; Backhouse, 2009). Regarding programme delivery, a project looking at the use of social media highlighted the benefits of this medium, while warning of the resource intensiveness required and suggesting the use of great caution here. As indicated, there are factors which may contribute to doping vulnerability or behaviours that require additional evidence provided by research, including gender issues, the role of peers, the importance of age, and ethnic/cultural differences (Batterham, 2006).

Regarding research methodology, a move towards more qualitative research appears to be the trend (Backhouse, 2009; Moran, 2008; Pifaretti, 2011). The necessity to work on the use of self-reporting is a priority, as it is one of the most used techniques and has an inherent selection bias (Petroczi, 2008). Longitudinal studies, holistic approaches, globalisation and understanding doping rejection are also key areas of consideration (Backhouse, 2006; Backhouse, 2009).

In order to continually enhance, improve and develop education programmes, evaluation of these programmes is a necessity. A document has been developed based on scientific evidence to support anti-doping organisations in evaluating their education programmes (Houlihan, 2012). It can be downloaded from the Education section of the WADA website.

Finally, educational techniques need to be selected to match the best approach with the learner in order to be most effective. More research is needed in certain areas to ensure that programme development is continually based on strong evidence.

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GLOSSARY

ADAMS

ADAMS (Anti-Doping Administration and Management System) enables athletes and anti-doping organisations to enter and share data related to doping control and meet certain responsibilities under the World Anti-Doping Code (Code). ADAMS is an online, Web-based system, which allows restricted sharing of data only with those organisations with a right to access such data in accordance with the Code.

ADVERSE ANALYTICAL FINDING (AAF)

Report from a laboratory or other testing entity that identifies in a doping control sample the presence of a prohibited substance or its metabolites or markers (including elevated quantities of endogenous substances) or evidence of the use of a prohibited method. An adverse analytical finding does not necessarily lead to an anti-doping rule violation, since an athlete may have a Therapeutic Use Exemption for this particular substance. An adverse analytical finding may also correspond to a measurement performed on an athlete as part of a longitudinal study.

ANTI-DOPING ORGANISATION (ADO)

Organisation that is responsible for adopting and executing rules for initiating, implementing or enforcing any part of the doping control process. This includes, for example, the International Olympic Committee, the International Paralympic Committee, other major event organisations that conduct testing at their events, the World Anti-Doping Agency, International Sports Federations, Regional Anti-Doping Organisations and National Anti-Doping Organisations.

ANTI-DOPING RULE VIOLATION (ADRV)

Determination that one of the following rule violations listed in the Code has occurred:

1. the presence of a prohibited substance or its metabolites or markers in an athlete's bodily specimen
2. use or attempted use of a prohibited substance or a prohibited method
3. refusing, or failing without compelling justification, to submit to sample collection after notification, as authorized in applicable anti-doping rules or otherwise evading sample collection
4. violation of applicable requirements regarding athlete availability for out-of-competition testing, including failure to provide whereabouts information and missed tests which are declared based on reasonable rules
5. tampering, or attempting to tamper, with any part of doping control
6. possession of prohibited substances and methods
7. trafficking in any prohibited substance or prohibited method
8. administration or attempted administration of a prohibited substance or prohibited method to any athlete

9. assisting, encouraging, aiding, abetting, covering up or any other type of complicity involving an anti-doping rule violation or any attempted violation
10. prohibited Association, that is, association by an athlete or other person subject to the authority of an Anti-Doping Organisation with support personnel who have committed an ADRV, whether that be the possession, administration or trafficking of a prohibited substance, or another ADRV identified in the Code

ATHLETE WHEREABOUTS INFORMATION

Information provided by or on behalf of an athlete which details the athlete's location on a daily basis in order to enable unannounced testing.

CHAPERONE

Official who is trained and authorized by the anti-doping organisation to carry out specific duties including one or more of the following: notification of the athlete selected for sample collection, accompanying and observing the athlete until arrival at the doping control station, and/or witnessing and verifying the provision of the sample where the training qualifies him/her to do so.

CODE COMPLIANCE

Being code compliant means that a sports organisation has amended its rules and policies to respect the mandatory articles and principles of the World Anti-Doping Code and is enforcing them.

CODE IMPLEMENTATION

This is the process of a sports organisation amending its rules and policies to include the articles and principles of the World Anti-Doping Code.

COPENHAGEN DECLARATION

The Copenhagen Declaration on Anti-Doping in Sport (Copenhagen Declaration) is a political document through which governments signal their intention to adopt the World Anti-Doping Code through the UNESCO International Convention against Doping in Sport. The Copenhagen Declaration was finalized by governments at the second World Conference on Doping in Sport in Copenhagen in March 2003.

COURT OF ARBITRATION FOR SPORT (CAS)

Institution which is independent of any sports organisation and provides for services in order to facilitate the settlement of sport-related disputes through arbitration or mediation by means of procedural rules adapted to the specific needs of the sports world. CAS is often referred to as 'sport's supreme court.' WADA has a right of appeal to CAS for doping cases under the jurisdiction of organisations that have implemented the World Anti-Doping Code.

DOPING CONTROL

Process including test distribution planning, sample collection and handling, laboratory analysis, therapeutic use exemptions, results management, hearings and appeals.

DOPING CONTROL OFFICER (DCO)
Official who has been trained and authorised by the anti-doping organisation with delegated responsibility for the on-site management of a sample collection session.

DOPING CONTROL STATION
Location where the sample collection session is conducted.

INDEPENDENT OBSERVERS (IO)
Team of anti-doping experts, gathered by WADA for a major sporting event, who monitor, audit and report on the doping control and results management processes at that particular event.

INTERNATIONAL FEDERATION (IF)
International non-governmental organisation administering one or more sports at global level.

INTERNATIONAL STANDARD
Adopted in support of the World Anti-Doping Code and as part of the World Anti-Doping Programme, WADA developed five International Standards aimed at bringing harmonisation among anti-doping organisations in technical areas. These are: the Prohibited List, the International Standard for Testing and Investigations, the International Standard for Laboratories, the International Standards for Therapeutic Use Exemptions and the International Standard for the Protection of Privacy and Personal Information.

MAJOR EVENT/GAMES ORGANISATION
Continental associations of National Olympic Committees and other international multi-sport organisations that function as the ruling bodies for any continental, regional or other international event.

MARKER
Compound, group of compounds or biological parameters that indicate the use of a prohibited substance or prohibited method.

METABOLITE
Any substance produced by a biotransformation process.

MISSED TEST
Conduct that may be relied upon to establish a failure by the athlete to be available for testing on any given day at the location and time specified in the time-slot identified in his or her athlete whereabouts filing for that day.

MODELS OF BEST PRACTICE
Model rules, guidelines and sample forms developed by WADA based on the World Anti-Doping Code and the International Standards to provide state of the art solutions in different areas of anti-doping. These models, which are part of the World Anti-Doping Programme, are recommended by WADA to its stakeholders, but their implementation is not mandatory.

NATIONAL ANTI-DOPING ORGANISATION (NADO)
Entity designated by a country as possessing the primary authority and responsibility to adopt and implement anti-doping rules, as well as direct the collection of samples, the management of test results, and the conduct of hearings, all at the national level. If this designation has not been made by the competent public authority(ies), the entity will be the country's National Olympic Committee or its designee.

NON-ANALYTICAL POSITIVE
Terminology sometimes used to describe an anti-doping rule violation other than the presence of a prohibited substance or its metabolites or markers in an athlete's bodily specimen.

PROHIBITED LIST
List identifying the substances and methods prohibited in sport. The Prohibited List is one of the four WADA International Standards and is mandatory for signatories to the World Anti-Doping Code.

REGIONAL ANTI-DOPING ORGANISATION (RADO)
Anti-Doping Organisation established by a group of countries to coordinate, manage and deliver the mandate of doping-free sport within a specific region. WADA's anti-doping development programme aims at facilitating the creation of such entities in order to ensure implementation of anti-doping programmes in all parts of the world.

REGISTERED TESTING POOL (RTP)
Pool of top level athletes established separately by each International Federation (IF) and National Anti-Doping Organisation (NADO) who are subject to both in-competition and out-of-competition testing as part of that IF's or NADO's test distribution plan.

RESULTS MANAGEMENT
Process for the pre-hearing administration of potential anti-doping rule violations. This process notably includes the initial review of the adverse analytical finding (determination of whether an applicable therapeutic use exemption has been granted, notification of the athlete as regards his or her right to request the B-sample analysis) and the possible imposition of a provisional suspension. WADA is never involved in the individual management of findings, which falls under the responsibility of the anti-doping organisation involved in the particular case.

SAMPLE COLLECTION SESSION
All of the sequential activities that directly involve the athlete, from notification until the athlete leaves the doping control station after having provided his/her sample/s.

SAMPLE/SPECIMEN
Any biological material collected for the purposes of doping control.

STRICT LIABILITY PRINCIPLE
The principle of strict liability means that an anti-doping rule violation occurs whenever a prohibited substance (or its metabolites or markers) is found in the bodily specimen of an athlete, whether or not the athlete intentionally or unintentionally used a prohibited substance or was negligent or otherwise at fault.

TESTING
Parts of the doping control process involving test distribution planning, sample collection, sample handling, and sample transport to the laboratory.

TESTING AUTHORITY
The International Olympic Committee, the International Paralympic Committee, WADA, an International Federation, a National Sport Organisation, a National Olympic Committee, a Major Event/ Games Organisation, or another authority responsible for sample collection and transport either in-competition or out-of-competition and/or for management of the test result.

THERAPEUTIC USE EXEMPTION (TUE)
Permission granted to an athlete by an Anti-Doping Organisation to use, for therapeutic purposes, a substance or method included in the Prohibited List.

UNESCO CONVENTION
The International Convention against Doping in Sport (UNESCO Convention) was developed by governments under the aegis of UNESCO and unanimously adopted by UNESCO General Conference on October 19, 2005. It is currently being ratified by governments individually. It is a legal tool enabling governments to align domestic policy with the World Anti-Doping Code.

WORLD ANTI-DOPING AGENCY (WADA)
The World Anti-Doping Agency (WADA) is the international independent organisation created in 1999 to promote, coordinate and monitor the fight against doping in sport in all its forms at the international level. The Agency is composed and funded equally by the Olympic movement and governments of the world. Its key activities include scientific research, education, out-of-competition testing, and development of anti-doping capacities and monitoring of the World Anti-Doping Code.

WADA ACCREDITED LABORATORY
Anti-doping laboratory accredited by WADA in compliance with the International Standard for Laboratories, applying test methods and processes to provide evidentiary data for the detection and, if applicable, quantification of a threshold substance on the Prohibited List in urine and other biological samples. WADA has been responsible for accrediting and re-accrediting anti-doping laboratories since 2004.

WORLD ANTI-DOPING CODE
The World Anti-Doping Code (Code) is the core document that provides the harmonized framework for anti-doping policies, rules, and regulations within sport organisations and among public authorities.