



Drugs and The Athlete

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Introduction

- The use of performance-enhancing drugs is probably the major problem facing sport today.
- Despite intense efforts by sporting bodies and the medical profession to eliminate the problem, drug taking to assist sports performance remains widespread.

o The **International Olympic Committee's (IOC)** definition of doping is:

The use of an expedient (substance or method) which is potentially harmful to athlete's health and/or capable of enhancing their performance, or the presence in the athlete's body of a prohibited substance or evidence of the use thereof or evidence of the use of a prohibited method..

Historical perspective

- Drugs were used to enhance performance in ancient civilizations.
 - The ancient **Greeks** used mushrooms
 - **Roman** wrestlers used special mixtures of herbs to improve performance.
 - A favorite mixture among ancient **Egyptian** athletes is said to have been the rear hooves of an Abyssinian ass, ground up, boiled in oil and flavored with rose petals and rosehip
 - **Norwegian** warriors, the Berserkers, fortified themselves with psychoactive mushrooms

- **Indigenous South African** tribes used a local liquor called '**dop**' as a stimulant, leading to the use of the word 'doping'.
- Substances used included caffeine, alcohol, glyceryl trinitrate (nitroglycerine), opium and strychnine.
- The first reported drug-related death occurred in **1896** when an English cyclist died of an overdose of 'trimethyl'.
- **Thomas Hicks** ran to victory in the Olympic marathon of **1904** in St Louis with the help of raw egg, injections of strychnine, and doses of brandy administered to him during the race.
- The origins of the current epidemic of drug use among sportspeople can be traced back to the introduction of various substances during **World War II**.
- **Amphetamines** were introduced to US troops to help keep them awake at the battlefield.
- This problem came to public attention when **Danish cyclist**, Kurt Jensen, died from a heat-related illness at the 1960 Rome Olympics.

- o 1964 Tokyo Olympics led the IOC to establish a Medical Commission in 1967 and to ban the use of pharmaceutical agents to enhance performance.
- o The IOC commenced drug testing at the 1968 Olympics in Mexico but it was not until the 1972 Olympics in Munich that **full-scale testing was commenced**
- o The use of anabolic steroids can be traced back to 1927
- o first reported use of testosterone in humans came during World War II when German storm-troopers used it to enhance their aggressiveness.
- o Soviet athletes used anabolic steroids in the 1952 Olympics in Helsinki

- o The use of anabolic steroids, especially by power athletes, became widespread in the late 1960s and 1970s.
- o A reliable test method was finally developed in 1974 and the IOC added anabolic steroids to its list of prohibited substances in 1975
- o In 1983, caffeine and testosterone were added to the prohibited list
- o The first allegations regarding blood doping were made about Finnish distance runners in the 1970s.
- o World Anti- Doping Agency (WADA) was established in November 1999 to promote and coordinate the fight against doping in sport internationally.

Why athletes take drugs

- **Knowledge** or a belief that their competitors are taking drugs
- A determination to do anything possible to attain success
- Direct or indirect **pressure** from coaches, parents and peers
- Pressure from government and/or authorities themselves (e.g. Eastern block countries during the 1960s to 1990s)
- **Lack of access** to legal and natural methods to enhance performance (e.g. nutrition, psychology, recovery)
- **Community** attitudes and expectations regarding success and performance
- **Financial** rewards
- Influence from the **media** in facilitating these expectations and rewards

Prohibited substances

- WADA is responsible for producing and maintaining the World Anti-Doping Code containing the Prohibited List of Substances, which contains those substances and methods that are banned either at all times or in competition only.
- Substances will be added to the list if they satisfy any two of the following three criteria:
 - the potential for enhanced performance
 - the potential for being detrimental to health
 - they violate the spirit of sport.
- Therapeutic Use Exemption (TUE)

WADA's list of prohibited substances and methods (as at 1 January 2006)

Prohibited classes of substances (in and out of competition)

- S1. Anabolic agents
- S2. Hormones and related substances, mimetics and analogs
- S3. Beta-2 agonists
- S4. Agents with anti-estrogenic activity
- S5. Diuretics and other masking agents

Prohibited classes of substances (in competition only)

- S6. Stimulants
- S7. Narcotics
- S8. Cannabinoids
- S9. Glucocorticosteroids

Prohibited methods (in and out of competition)

- M1. Enhancement of oxygen transfer
- M2. Chemical and physical manipulation
- M3. Gene doping

Substances prohibited in particular sports

- P1. Alcohol
- P2. Beta-blockers

Prohibited classes of substances

Anabolic agents

o **Anabolic androgenic steroids**

o *Effect on performance*

o *Anabolic effect*

o *Anticatabolic effect*

o *Enhancement of aggressive behavior*

o *Side-effects*

Table 61.2 Side-effects of anabolic steroids

Common	Less common
Both sexes	
Acne Alopecia Abnormal liver enzymes Lowered HDL level Raised LDL level Elevated triglyceride level Hypertension Reduced humoral immunity Irritability Aggression Mood swings Changes in libido ? Addiction	Peliosis hepatis Hepatoma/ hepatocarcinoma Wilms' tumor Coronary artery disease Tendon ruptures Psychosis Acute schizophrenia ? Addiction ? Leukemia
Males	
Decreased sperm production Decreased testicle size Decreased FSH, LH Gynecomastia	? Cancer of the prostate
Females	
Menstrual irregularities	Deepening of voice Male pattern baldness Hirsutism Clitoromegaly Breast shrinkage
Adolescents	
Increased facial/body hair Acne Premature closure of epiphyses	Phallic enlargement Male pattern baldness Deepening of voice Abnormal psychosocial maturation
FSH = follicle stimulating hormone; HDL = high-density lipoprotein; LDL = low-density lipoprotein; LH = luteinizing hormone.	

- ◊ **Testosterone precursors**
- ◊ **Tetrahydrogestrinone (THG)**
- ◊ **Clenbuterol**

Hormones and related substances

- ◊ Erythropoietin
- ◊ Human growth hormone
- ◊ Insulin-like growth factors
- ◊ Human chorionic gonadotrophin
- ◊ Insulin
- ◊ Corticotrophins

- o Beta-2 agonists*
- o Agents with anti-estrogenic activity*
- o Diuretics and other masking agents*
- o Stimulants*
- o Narcotics*
- o Cannabinoids*
- o Glucocorticosteroids*

Prohibited methods

o Enhancement of oxygen transfer

M1: Enhancement of oxygen transfer

The following are prohibited:

1. Blood doping, including the use of autologous, homologous or heterologous blood or red blood cell products of any origin.
2. Artificially enhancing the uptake, transport or delivery of oxygen, including but not limited to perfluorochemicals, efaproxiral (RSR13) and modified hemoglobin products (e.g. hemoglobin-based blood substitutes, microencapsulated hemoglobin products).

- o Chemical and physical manipulation*
- o Gene doping*

Classes of drugs banned in certain sports

o Alcohol

o Beta-blockers

Permitted substances

Drug groups permitted by WADA

Antibiotics

Antidepressants

Antidiarrheals

Antihistamines

Antihypertensives (excluding beta-blockers)

Antinauseants

Aspirin (ASA), paracetamol (acetaminophen),
codeine, dextropropoxyphene

Eye medications

NSAIDs

Oral contraceptives

Skin creams and ointments

Sleeping tablets

Drug testing

o **Testing procedure**

o **Selection**

o **Notification**

o **Presenting for a drug test**

o **Sample collection**

o **Splitting, sealing and labeling of the sample**

o **Checking pH and concentration of sample**

o **Final paperwork**

Anti-Doping Rule Violations

There are eight anti-doping rule violations which relate to athletes and their support personnel.

1. The presence of a prohibited substance detected in a sample.
2. Use or attempted use of a prohibited substance or method.
3. Failure to comply or evasion.
4. Tampering or attempting to tamper.

Anti-Doping Rule Violations (Cont)

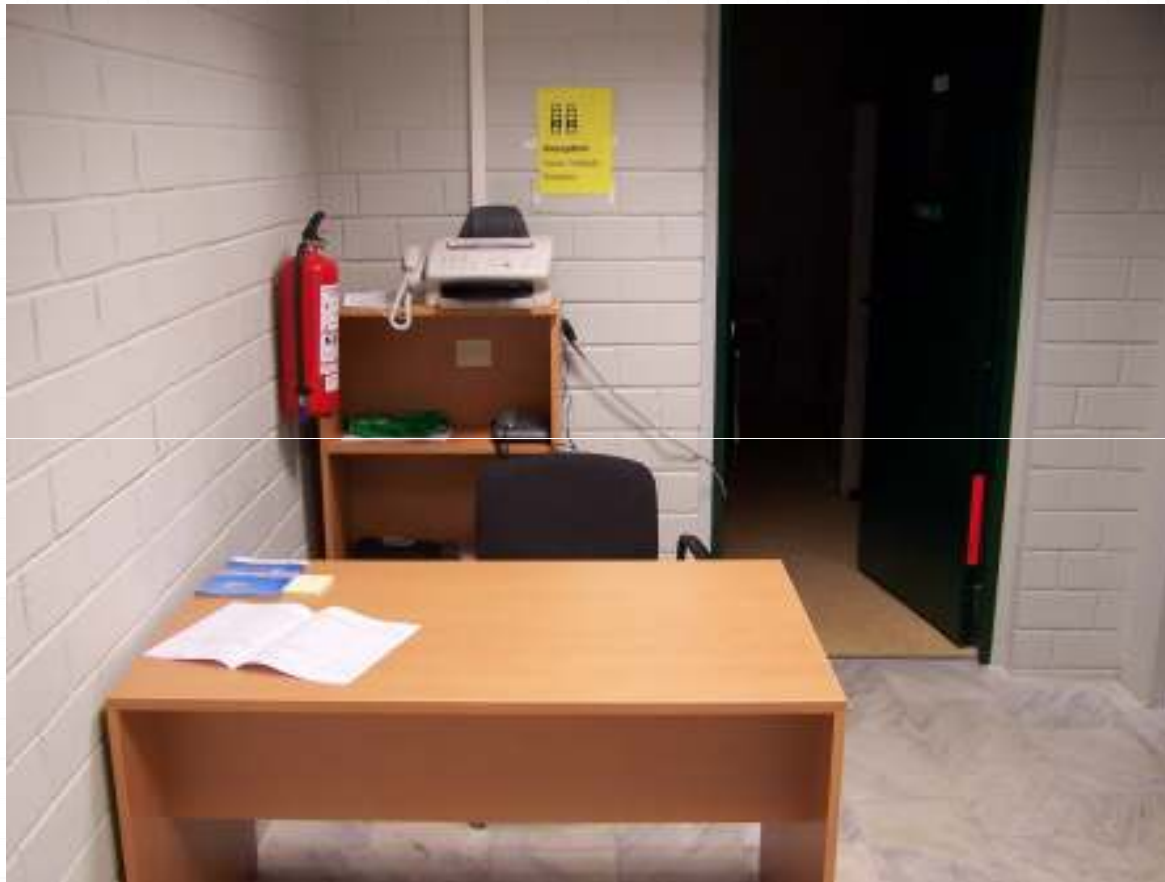
5. Failure to provide location information or being unavailable for testing.
6. Administration, assisting, involvement, covering up or any other type of complicity.
7. Possession.
8. Trafficking.

The doping control station



Entrance

The doping control station



Reception

The doping control station



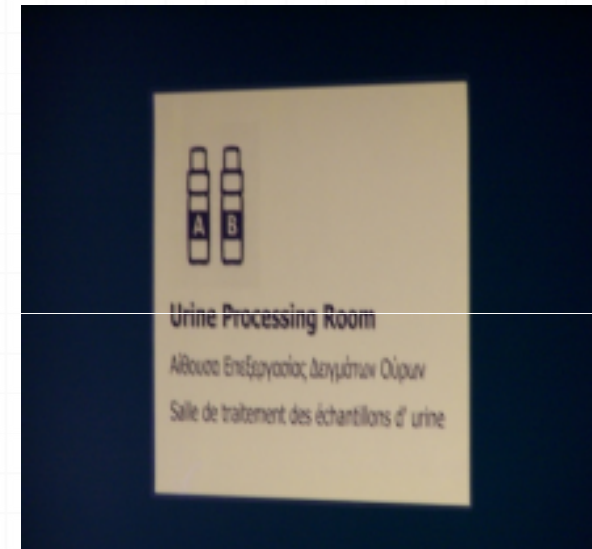
Waiting Room

The doping control station



Waiting Room

The doping control station



Washroom for Urine Provision

The doping control station



Doping Control Room

The doping control station



Doping Control table

The doping control station



Refractometer

The doping control KIT



IOC/WADA Approved Bereg Kit

Doping Control Procedure

The 25 Steps Approach

- o (1) Athlete arrives to the doping control station
- o (2) Athlete selects a kit
- o (3) Athlete verifies all sample code numbers
- o (4) DCO records the sample code numbers on the Form
- o (5) DCO instructs the athlete to pour his/her urine into the "B" bottle
- o (6) DCO instructs athlete to place cap on collection vessel

Doping Control Procedure

The 25 Steps Approach

- o (7) DCO instructs athlete to invert the “B” glass bottle and check for leakage
- o (8) DCO instructs athlete to place the “B” glass bottle into the “B” plastic container
- o (9) DCO instructs athlete to pour remaining urine into “A” glass bottle while leaving a few drops to test for pH and SG
- o (10) DCO instructs athlete to place cap on “A” glass bottle, invert and check for leakage
- o (11) DCO instructs athlete to place the “A” glass bottle into the “A” plastic container

Doping Control Procedure

The 25 Steps Approach

- o (12) DCO instructs athlete to seal both containers
- o (13) DCO checks the residual urine for pH and SG
- o (14) DCO records readings on Doping Control Form and reads declaration to athlete
- o (15) DCO records the time the sample was sealed
- o (16) DCO instructs athlete to initial the form
- o (17) DCO asks the athlete to indicate any medications / nutritional supplements consumed in the last 10 days

Doping Control Procedure

The 25 Steps Approach

- o (18) DCO reviews the Doping Control Form for errors / blank omissions.
- o (19) DCO signs the form as the DCO for the first sample.
- o (20) DCO asks the athlete and athlete's representative if they are satisfied with the manner in which the doping control process was conducted.
- o (21) DCO asks the athlete's representative to sign.
- o (22) DCO asks the athlete to record any remarks and sign the form.

Doping Control Procedure

The 25 Steps Approach

- o (23) DCO separates the paper work and informs the athlete of which copy will go the laboratory.
- o (24) DCO places the athlete's sample and the laboratory's copy of the paper work into the Versapak transportation bag.
- o (25) DCO provides the athlete with his/her copy of the paperwork and informs the athlete to retain his/her copy for a period of six weeks. DCO also informs the athlete that he/she will only be notified if there is a problematic finding.

Doping Control Procedure

- The Transportation bag should contain:
 - the sealed samples
 - the lab copies of the Doping Control Form
 - the Lab Advice / Chain of Custody Form
- The bag should be sealed as soon as possible (after a testing session is complete or the bag is full)
- The bag should be sealed or in a secure place when you are not with them

Doping Control Procedure

IMPORTANT:

- Samples should be refrigerated as soon as possible
- Samples should be sent to the lab as soon as possible
- Samples should be sent by courier and waybill should be noted for tracking and chain of custody

Thanks