

INTERNATIONAL OLYMPIC COMMITTEE  
MEDICAL COMMISSION  
DEFINITION OF DOPING AND LIST OF DOPING CLASSES AND METHODS  
5 September 1994  
until further notice

Doping contravenes the ethics of both sport and medical science. The IOC Medical Commission's definition of doping consists of 2 points:

1. A ban of administration of substances belonging to selected classes of pharmacological agents and
2. The use of various doping methods

I. DOPING CLASSES

- A. Stimulants
- B. Narcotics
- C. Anabolic Agents
- D. Diuretics
- E. Peptide and glycoprotein hormones and analogues

II. DOPING METHODS

- A. Blood doping
- B. Pharmacological, chemical and physical manipulation

III. CLASSES OF DRUGS SUBJECT TO CERTAIN RESTRICTIONS

- A. Alcohol
- B. Marijuana
- C. Local anaesthetics
- D. Corticosteroids
- E. Beta-blockers

## EXAMPLES AND EXPLANATIONS

The following list represents examples of the different doping classes to illustrate the doping definition. No substances belonging to the banned classes may be used even if they are not listed as examples. For this reason, the term "and related substances" is introduced. This term describes drugs that are related to the class by their pharmacological actions and/or chemical structure. A longer list of examples belonging to different pharmacological classes of banned substances can be found in the enclosed annex 1.

If substances of the banned classes are identified by an IOC accredited laboratory the relevant authority will act.

### I. DOPING CLASSES

#### A. Stimulants

Stimulants comprise various types of substances which increase alertness, reduce fatigue and may increase competitiveness and hostility. Their use can also produce loss of judgement, which may lead to accidents to others in some sports. Amphetamine and related compounds have the most notorious reputation in producing problems in sport. Some deaths of sportsmen have resulted even when normal doses have been used under conditions of maximum physical activity. There is no medical justification for the use of amphetamines.

One group of stimulants is the sympathomimetic amines of which ephedrine, pseudoephedrine, phenylpropanolamine and norpseudoephedrine are examples. In high doses, this type of compound produces mental stimulation and increased blood flow. Adverse effects include elevated blood pressure and headache, increased and irregular heart beat, anxiety and tremor. These compounds, are often present in cold and hay fever preparations which can be purchased in pharmacies and sometimes from other retail outlets without medical prescription.

Another group of stimulants is the beta-2 agonists. These drugs are unusual because they are classified as both stimulants and anabolic agents. When taken by mouth or by injection they exert powerful stimulatory and anabolic effects.

**Oral and injectable administration of beta-2 agonists is banned.**

Of the beta-2 agonists only SALBUTAMOL and TERBUTALINE are permitted and only by inhalation. Any physician wishing to administer beta-2 agonists by inhalation must give written notification to the relevant medical authority.

The choice of medications to treat asthma and other common respiratory disorders pose problems because some of the more commonly prescribed substances are powerful stimulants. Furthermore because these drugs have many different product names, the status of a drug may be confusing. The most prudent approach is to never take or prescribe a product for colds, sore throats, and flu without first checking with a physician or pharmacist who has special expertise in this area.

- Some examples of stimulants are:  
amiphenazole                      amphetamines  
amineptine                        caffeine \*  
cocaine                              ephedrines  
fencamfamine                      mesocarb  
pentylentetrazol                pipradol  
salbutamol \*\*                      terbutaline \*\*  
... and related substances

\* For caffeine the definition of a positive depends on the concentration of caffeine in the urine. The concentration in urine may not exceed 12 micrograms per milliliter.

\*\* Permitted by inhaler only and must be declared to the relevant medical authority. (see annex 2:"notification form").

NOTE: All imidazole preparations are acceptable for topical use, e.g. oxymetazoline. Vasoconstrictors (e.g. adrenaline) may be administered with local anaesthetic agents. Topical preparations (e.g. nasal, ophthalmological) of phenylephrine are permitted.

#### B. Narcotic analgesics

Morphine and other compounds of this class are powerful analgesics and are mainly used for the management of severe pain. These substances have major side effects, including respiratory depression, and they carry a high risk of physical and psychological dependence. Evidence reveals that narcotic analgesics have been abused in sports. Therefore the IOC Medical Commission has issued and maintained a ban on their use. The ban is consistent with international restrictions and with the regulations and recommendations of the World Health Organisation regarding narcotics.

- Some examples of narcotic analgesics are:  
dextromoramide                      dextropropoxyphene  
diamorphine (heroin)                methadone  
morphine                                pentazocine  
pethidine  
... and related substances

NOTE : CODEINE, DEXTROMETHORPHAN, DIHYDROCODEIN,  
DIPHENOXYLATE AND PHOLCODINE ARE PERMITTED.

### C. Anabolic agents

The Anabolic class includes anabolic androgenic steroids (AAS) and Beta-2 agonists.

#### 1. Anabolic androgenic steroids (AAS)

The AAS class includes testosterone and substances that are related in structure and activity to it. They have been misused in sport to increase muscle strength and bulk, and to promote aggressiveness. The use of AAS is associated with adverse effects on the liver, skin, cardiovascular and endocrine systems. They can promote the growth of tumors and induce psychiatric syndromes. In males AAS decrease the size of the testes and diminish sperm production. Females experience masculinization, loss of breast tissue and diminished menstruation. The use of AAS by teenagers can stunt growth.

- Some examples of AAS are:

clostebol	fluoxymesterone
metandienone	metenolone
nandrolone	oxandrolone
stanozolol	testosterone*

... and related substances

\* The administration of testosterone is banned. The presence of a testosterone (T) to epitestosterone (E) ratio greater than six (6) to one (1) in the urine of a competitor constitutes an offence unless there is evidence that this ratio is due to a physiological or pathological condition, e.g. low epitestosterone excretion, androgene production of tumor, enzyme deficiencies.

In the case of T/E higher than 6, it is mandatory that the responsible authority conduct an investigation before the sample is declared positive. A full report will be written and will include a review of previous tests, subsequent tests and any results of endocrine investigations. In the event that previous tests are not available, the athlete should be tested unannounced at least once per month for three months. The results of these investigations should be included in the report. Failure to cooperate in the investigations will result in declaring the sample positive.

#### 2. Beta-2 agonists

When given systemically, beta-2 agonists may have powerful anabolic effects, and their use is therefore banned. (See also section IA)

- Some examples of beta-2 agonists are:

clenbuterol  
salbutamol  
terbutaline  
salmeterol  
fenoterol

... and related substances

#### D. Diuretics

Diuretics have important therapeutic indications for the elimination of excess body fluids from the tissues in certain pathological conditions and for management of high blood pressure.

Diuretics are sometimes misused by competitors for two main reasons, namely:

- to reduce weight quickly in sports where weight categories are involved and
- to reduce the concentration of substances by diluting the urine.

Rapid reduction of weight in sport cannot be justified medically. Health risks are involved in such misuse because of serious side-effects which might occur.

Furthermore, deliberate attempts to reduce weight artificially in order to compete in lower weight classes or to dilute urine constitute clear manipulations which are unacceptable on ethical grounds.

For sports involving weight classes, the responsible authorities reserve the right to obtain urine samples from the competitor at the time of the weigh-in.

- Some examples of diuretics are:

acetazolamide	bumetanide
chlorthalidone	ethacrynic acid
furosemide	hydrochlorothiazide
mannitol	mersalyl
spironolactone	triamterene
... and related substances	

#### E. Peptide and glycoprotein hormones and analogues

1. Chorionic Gonadotrophin (HCG - human chorionic gonadotrophin): it is well known that the administration to males of Human Chorionic Gonadotrophin (HCG) and other compounds with related activity leads to an increased rate of production of endogenous androgenic steroids and is considered equivalent to the exogenous administration of testosterone.

2. Corticotrophin (ACTH): Corticotrophin has been misused to increase the blood levels of endogenous corticosteroids notably to obtain the euphoric effect of corticosteroids. The application of Corticotrophin is considered to be equivalent to the oral, intra-muscular or intravenous application of corticosteroids. (See section III. D).

3. Growth hormone (HGH, somatotrophin): the misuse of Growth Hormone in sport is unethical and dangerous, because of various adverse effects, for example, cardiomyopathy, hypertension, diabetes mellitus, and acromegaly when given in high doses for a long period of time. Contamination of some growth hormone preparations of human origin can cause Creutzfeldt Jacob disease (a fatal neurological condition).

All the respective releasing factors of the above-mentioned substances are also banned.

4. Erythropoietin (EPO):

This naturally occurring hormone is produced in the kidney and regulates red blood cell production. Synthetic EPO is currently available and has been demonstrated to induce changes similar to blood doping (see 2A).

## II. METHODS

### A. Blood doping

Blood transfusion is the intravenous administration of red blood cells or related blood products that contain red blood cells. Such products can be obtained from blood drawn from the same (autologous) or from a different (homologous) individual. The most common indications for red blood cell transfusion in conventional medical practice are acute blood loss and severe anaemia.

Blood doping is the administration of blood, red blood cells and related products to an athlete. This procedure may be preceded by withdrawal of blood from the athlete who continues to train in this blood depleted state.

These procedures contravene the ethics of medicine and of sport. There are also risks involved in the transfusion of blood and related blood products. These include the development of allergic reactions (rash, fever etc.) and acute haemolytic reaction with kidney damage if incorrectly typed blood is used, as well as delayed transfusion reaction resulting in fever and jaundice, transmission of infectious diseases (viral hepatitis and AIDS), overload of the circulation and metabolic shock.

Therefore the practice of blood doping in sport is banned by the IOC Medical Commission (see I.E.4 )

### B. Pharmacological, chemical and physical manipulation

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The IOC Medical Commission bans the use of substances and of methods which alter the integrity and validity of urine samples used in doping controls. Examples of banned methods are catheterisation, urine substitution and-or tampering, inhibition of renal excretion. e.g. by probenecid and related compounds, and epitestosterone administration. If the epitestosterone concentration is greater than 200 ng/ml, the laboratories should notify the appropriate authorities. The IOC Medical Commission recommends that under these circumstances further investigations be conducted.

### III. CLASSES OF DRUGS SUBJECT TO CERTAIN RESTRICTIONS

#### A. Alcohol

In agreement with the International Sports Federations and the responsible authorities, tests may be conducted for ethanol. The results may lead to sanctions.

#### B. Marijuana

In agreement with the International Sports Federations and the responsible authorities, tests may be conducted for cannabinoids (Marijuana, Hashish ...). The results may lead to sanction.

#### C. Local anaesthetics

Injectable local anaesthetics are permitted under the following conditions:

- a) that bupivacaine, lidocaine, mepivacaine, procaine, etc. are used but not cocaine. Vasoconstrictor agents (e.g. adrenaline) may be used in conjunction with local anaesthetics.
- b) only local or intra-articular injections may be administered;
- c) only when medically justified (e.g. the details including diagnosis) dose and route of administration must be submitted immediately in writing to the relevant medical authority.

#### D. Corticosteroids

Because of their anti-inflammatory properties, the naturally occurring and synthetic corticosteroids are widely used in medicine to treat many diseases. When administered systemically, they influence the natural production of corticosteroids by the body. Corticosteroids may produce mood changes including euphoria and other side effects such that their medical use, except when administered topically, demands medical control.

Because it was known that corticosteroids were being used non-therapeutically in certain sports by the oral, rectal, intramuscular and even the intravenous routes, the IOC Medical Commission attempted to restrict their use during competition by requiring a declaration by doctors. However, as such restrictions failed to solve the problem, stronger measures, designed not to interfere with appropriate medical use of corticosteroids, became necessary.

The use of corticosteroids is banned except:

- A. for topical use (aural, dermatological and ophthalmological) but not rectal;
- B. by inhalation;
- C. by intra-articular or local injection.

However, because of a recent marked and unexplained increase in the number of athletes requiring corticosteroids by inhalation during competitions, the IOC Medical Commission has introduced mandatory reporting of athletes requiring this type of medication.

ANY TEAM DOCTOR WISHING TO ADMINISTER CORTICOSTEROIDS BY LOCAL OR INTRA-ARTICULAR INJECTION, OR BY INHALATION, TO A COMPETITOR MUST GIVE WRITTEN NOTIFICATION TO THE RESPONSIBLE MEDICAL AUTHORITY.

E. Beta-blockers e.g.

Due to the continued misuse of beta-blockers in some sports the IOC Medical Commission reserves the right, at the Olympic Games to test those sports which it deems appropriate. These are unlikely to include endurance events which necessitate prolonged periods of high cardiac output and large stores of metabolic substrates in which beta-blockers would severely decrease performance capacity.

In agreement with the rules of the International Sports Federations, tests will be conducted in the following sports: e.g. archery, bobsleigh, diving and synchronized swimming, luge, modern pentathlon, shooting, ski jumping, free style skiing, at the discretion of the responsible authorities.

- Some examples of beta-blockers are:

acebutolol	alprenolol
atenolol	labetalol
metoprolol	nadolol
oxprenolol	propranolol
sotalol	

... and related substances

Paris, 5 September 1994

ANNEX 1

EXPANDED LIST OF EXAMPLES

**CAUTION:** This is not an exhaustive list of banned substances. It is provided only to give the reader a more comprehensive list of banned substances. Many substances that do not appear on this expanded list are considered banned under the term "and related substances".

**A. STIMULANTS**

amfepramone  
amineptine  
amphetamine  
caffeine  
cathine  
cocaine  
cropropamide  
crotethamide  
ephedrine  
etamivan  
etilamphetamine  
etilefrine  
fencamfamine  
fenetylline  
fenfluramine  
heptaminol  
mefenorex  
mephentermine  
mesocarb  
methamphetamine  
methoxyphenamine  
methylenedioxyamphetamine  
methylephedrine  
methylphenidate  
nikethamide  
norphenfluramine  
parahydroxyamphetamin  
pemoline  
phendimetrazine  
phentermine  
phenylpropanolamine  
pholedrine  
prolintane  
propylhexedrine  
pseudoephedrine  
salbutamol  
strychnine

**B. NARCOTICS**

dextropropoxyphene  
ethylmorphine  
hydrocodone  
morphine  
pentazocine  
pethidine  
propoxyphene

**C. 1) ANABOLIC STEROIDS**

**2) BETA2-AGONISTS**

boldenone  
clenbuterol  
clostebol  
danazol  
dehydrochlormethyltest.  
dehydrotestosterone  
drostanolone  
fluoxymesterone  
formebolone  
mesterolone  
metandienone  
metenolone  
methandriol  
methyltestosterone  
mibolerone  
nandrolone  
norethandrolone  
oxandrolone  
oxymesterone  
oxymetholone  
stanozolol  
testosterone  
trenbolone

**D. BETA BLOCKERS**

acebutolol  
alprenol  
atenolol  
betaxolol  
bisoprolol  
bunolol  
metoprolol  
oxprenolol  
propranolol  
sotalol

**E. DIURETICS**

acetazolamide  
bendroflurmethiazide  
bumetanide  
canrenone  
chlortalidone  
furosemide  
hydrochlorothiazide  
indapamide  
spironolactone  
triamterene

**F. MASKING AGENTS**

epitestosterone  
probenecid

**G. PEPTIDE HORMONES**

HCG  
hGH  
erythropoietin  
ACTH