

DOPING IN SPORTS

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INTRODUCTION

The word doping is probably 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.

The strychnine, caffeine, cocaine, and alcohol were often used by cyclists and other endurance athletes in the 19th century.

In 1904 Olympic Games in Saint Louis, Mr. Thomas Hicks Marathon runner have won the medal with the help of raw egg, injections of strychnine and doses of brandy administered to him during the race.

In 1928 the IAAF (athletics) became the first International Sport Federation (IF) to ban doping (use of stimulating substances).

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.

the urgency of anti-doping work had been highlighted by another tragic death, that of cyclist Tom Simpson during the Tour de France.

In 1966 UCI (cycling) and FIFA (football) were among the first IFs to introduce doping tests in their respective world championships.

In 1967, 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.

BEGINNING OF DOPING TESTS

Most International Federations introduced drug testing from 1970. Use of anabolic steroids was becoming widespread, especially in strength events such as throwing events and weightlifting, 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.

In 1988 Olympic Games in Seoul, Ben Johnson, the 100-metre champion who tested positive for stanozolol .

. In the 1990s, there was an evident connection between more effective test methods and a remarkable drop in the level of top results in some sports.

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.

Other ways of increasing the level of haemoglobin were being tried, however. One of these was erythropoietin. Erythropoietin (EPO) was included in the IOC's list of prohibited substances in 1990.

An EPO detection test (approved by WADA) was first implemented at the Sydney Olympic Games in 2000. The IOC took the initiative and convened the First World Conference on Doping in Sport in Lausanne in February 1999. Following the proposal of the Conference, the World Anti-Doping Agency (WADA) was established on November 10, 1999.

TABLE 1
LIST OF ATHLETES TESTED POSITIVE FOR A BANNED SUBSTANCE DURING
OR BEFORE AN ASIAN GAMES

S. NO.	Year	Place of Competition	Country	Sport	Banned Substance	Sex	Total
1.	1974	Tehran	Japan	Weightlifting	Stimulant	M	07
			North Korea	Weightlifting	do	M	
2.	1994	Hiroshima	China	Athletics	Dihydrotestosterone	F	07
				Canoeing		M	02
				Canoeing	do	M	
				Cycling	do	F	01
				Swimming	do	M	07
				Swimming	do	M	
				Swimming	do	F	
				Swimming	do	M	
				Swimming	do	F	
				Swimming	do	M	
				Swimming	do	F	
3.	1998	Bangkok	United Arab Emirates	Athletics	Ephedrine		
				Karate	do	M	01
			Jordan	Weight.Lifting.	Triamterene		
			Kuwait	Weight.Lifting.	Nandrolone		
4.	2002	Busan	Lebanon	Bodybuilding	Missing	M	05
5.	2006	Doha	India	Athletics	Male hormone	F	
			Bahrain	Bodybuilding	Missing	M	
			Iraq	Bodybuilding	Nandrolone		
			South Korea	Bodybuilding	Missing	M	
			United Arab Emirates	Bodybuilding	Missing		

			Myanmar	Weightlifting	Diuretic		
			Myanmar	Weightlifting	Metabolite	F	
			Uzbekistan	Weightlifting	Stanozolol		
6.	2010	Guangzhou	India	Athletics	Nandrolone		
			Qatar	Athletics	Testosterone	M	
			Palestine	Athletics	Norandrosterone		
S. NO.	Year	Place of Competition	Country	Sport	Banned Substance	Sex	Total
			Iran	Boxing	Nandrolone		01
			Uzbekistan	Judo	Methylhexanamine		01
			Uzbekistan	Wrestling	Methylhexanamine	M	01
			India	Athletics	Nandrolone		
Total							33

Table 1 indicates that most of players of different games and sports belong to Asian Countries were found to take the performance enhancing drugs during Asian games i.e. Ephedrine, Nandrolone, Testosterone, Stanozolol, Methylhexanamine, Norandrosterone, Triamterene, Dihydrotestosterone, Stimulant, Metabolite, and Diuretic from 1974 to 2010. All these drugs were banned during Asian Games organized in different Asian countries..

LIST OF DRUGS PROHIBITED BY WADA SINCE JAN. 1, 2013

1. ANABOLIC AGENTS

- (A) Anabolic Androgenic Steroids (AAS) : Exogenous-“exogenous” refers to a substance which is not ordinarily capable of being produced by the body naturally.
1-androstenediol; 1-androstenedione ; bolandiol ; bolasterone; boldenone; boldione ; calusterone; clostebol; danazol ; dehydrochlormethyltestosterone ; desoxymethyltestosterone; drostanolone; ethylestrenol ; fluoxymesterone; formebolone; furazabol ; gestrinone; 4-hydroxytestosterone ; mestanolone; mesterolone; metenolone; methandienone ; methandiol; methasterone ; methyldienolone; methyl-1-testosterone; methylnor testosterone ; methyltestosterone; metribolone ; mibolone; nandrolone; 19-norandrostenedione ; norboletone; norclostebol; norethandrolone; oxabolone; oxandrolone; oxymesterone; oxymetholone; prostanazol ; quinbolone; stanozolol; stenbolone; 1-testosterone ; tetrahydrogestrinone ; trenbolone ; and other substances with a similar chemical structure or similar biological effect.
- (B) Anabolic Androgenic Steroids (AAS) : Endogenous -“endogenous” refers to a substance which is capable of being produced by the body naturally.
androstenediol; androstenedione; dihydrotestosterone ; prasterone ; testosterone; and their metabolites and isomers, including but not limited to:
5 α -androstane; 5 α -androstane-3 β ,17 α -diol; 5 α -androstane; androst-4; 4-androstenediol ; 5-androstenedione ; epi-dihydrotestosterone; epitestosterone; etiocholanolone; 3 α -hydroxy-5 α -androstane-17-one; 3 β -hydroxy-5 α -androstane-17-one; 7 α -hydroxy-DHEA ; 7 β -hydroxy-DHEA ; 7-keto-DHEA; 19-norandrosterone; 19-noretiocholanolone. Other Anabolic Agents, including but not limited to:

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

2. PEPTIDE HORMONES, GROWTH FACTORS AND RELATED SUBSTANCES

1. Erythropoiesis-Stimulating Agents [e.g. erythropoietin (EPO), darbepoetin (dEPO), hypoxia- inducible factor (HIF) stabilizers, methoxy polyethylene glycol-epoetin beta (CERA), peginesatide (Hematide)].
2. Chorionic Gonadotrophin (CG) and Luteinizing Hormone (LH) in males;
3. Corticotrophins.
4. Growth Hormone, Insulin-like Growth Factor-1, Fibroblast Growth Factors, Hepatocyte Growth Factor, Mechano Growth Factors, Platelet-Derived Growth Factor, Vascular-Endothelial Growth Factor as well as any other growth factor affecting muscle, tendon or ligament protein synthesis/degradation, vascularisation, energy utilization, regenerative capacity or fibre type switching; and other substances with similar chemical structure or similar biological effect.

3. BETA-2 AGONISTS

All beta-2 agonists, including all optical isomers (e.g. d- and l-) where relevant, are prohibited except inhaled salbutamol (maximum 1600 micrograms over 24 hours), inhaled formoterol (maximum delivered dose 54 micrograms over 24 hours) and salmeterol when taken by inhalation in accordance with the manufacturers' recommended therapeutic regimen.

The presence in urine of salbutamol in excess of 1000 ng/mL or formoterol in excess of 40 ng/mL is presumed not to be an intended therapeutic use of the substance and will be considered as an Adverse Analytical Finding unless the Athlete proves, through a controlled pharmacokinetic study, that the abnormal result was the consequence of the use of the therapeutic inhaled dose up to the maximum indicated above.

4. HORMONE AND METABOLIC MODULATORS

1. Aromatase inhibitors including, but not limited to: aminoglutethimide, anastrozole, androsta-1,4,6-triene-3,17-dione (androstatrienedione), 4-androstene-3,6,17 trione (6-oxo), exemestane, formestane, letrozole, testolactone.
2. Selective estrogen receptor modulators (SERMs) including, but not limited to: raloxifene, tamoxifen, toremifene.
3. Other anti-estrogenic substances including, but not limited to: clomiphene, cyclofenil, fulvestrant.
4. Agents modifying myostatin function(s) including, but not limited, to: myostatin inhibitors.
5. Metabolic modulators: a) Insulins b) Peroxisome Proliferator Activated Receptor δ agonists, PPAR δ -AMP-activated protein kinase axis agonists.

5. DIURETICS AND OTHER MASKING AGENTS

1. Diuretics, desmopressin, plasma expanders (e.g. glycerol; intravenous administration of albumin, extran, hydroxyethyl starch and mannitol), probenecid; and other substances with similar biological effect(s).
2. Local administration of felypressin in dental anaesthesia is not prohibited.

3. Diuretics include: Acetazolamide, amiloride, bumetanide, canrenone, chlorthalidone, etacrynic acid, furosemide, indapamide, metolazone, spironolactone, thiazides (e.g. bendroflumethiazide, chlorothiazide, hydrochlorothiazide), triamterene; and other substances with a similar chemical structure or similar biological effect(s) (except drospirenone, pamabrom and topical dorzolamide and brinzolamide, which are not prohibited).
4. The use In- and Out-of-Competition, as applicable, of any quantity of a substance subject to threshold limits (i.e. formoterol, salbutamol, cathine, ephedrine, methylephedrine and pseudoephedrine) in conjunction with a diuretic or other masking agent requires the deliverance of a specific Therapeutic Use Exemption for that substance in addition to the one granted for the diuretic or other masking agent.

6. PROHIBITED METHODS

1. Manipulation of blood and blood components

1. The administration or reintroduction of any quantity of autologous, homologous or heterologous blood or red blood cell products of any origin into the circulatory system.
2. Artificially enhancing the uptake, transport or delivery of oxygen, including, but not limited to, perfluorochemicals, efaproxiral (RSR13) and modified haemoglobin products (e.g. haemoglobin-based blood substitutes, microencapsulated haemoglobin products), excluding supplemental oxygen.
3. Any form of intravascular manipulation of the blood or blood components by physical or chemical means.

2. Chemical and physical manipulation

1. Tampering, or attempting to tamper, in order to alter the integrity and validity of Samples collected during Doping Control. These include but are not limited to urine substitution and/or adulteration (e.g. proteases).
2. Intravenous infusions and/or injections of more than 50 mL per 6 hour period except for those legitimately received in the course of hospital admissions or clinical investigations.

3. Gene doping

1. The transfer of polymers of nucleic acids or nucleic acid analogues;
2. The use of normal or genetically modified cells.

7 SUBSTANCES AND METHODS PROHIBITED IN-COMPETITION

In addition to the categories 1 to 5 and 6 (1) to (3) defined above, the following categories are prohibited In-Competition:

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

- prolintane. A stimulant not expressly listed in this section is a Specified Substance.
- (b) Specified Stimulants : Adrenaline ; cathine; ephedrine; etamivan; etilefrine; fenbutrazate; fencamfamin; heptaminol; isometheptene; levmetamfetamine; meclofenoxate; methylephedrine; methylhexanamine (dimethylpentylamine); methylphenidate; nikethamide; norfenefrine; octopamine; oxilofrine (methysynephrine); parahydroxyamphetamine;pemoline; pentetrazol; phenpromethamine; propylhexedrine; pseudoephedrine; selegiline; sibutramine; strychnine; tuaminoheptane; and other substances with a similar chemical structure or similar biological effect.

The bupropion, caffeine, nicotine, phenylephrine, phenylpropanolamine, pipradol, synephrine) are not considered as Prohibited Substances.

Local administration (e.g. nasal, ophthalmologic) of Adrenaline or co-administration with local anaesthetic agents is not prohibited.

Cathine is prohibited when its concentration in urine is greater than 5 micrograms per milliliter.

Each of ephedrine and methylephedrine is prohibited when its concentration in urine is greater than 10 micrograms per milliliter.

Pseudoephedrine is prohibited when its concentration in urine is greater than 150 micrograms per milliliter.

7. NARCOTICS

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

8. CANNABINOIDS

Natural (e.g. cannabis, hashish, marijuana) or synthetic delta 9-tetrahydrocannabinol (THC) and cannabimimetics are prohibited.

9. GLUCOCORTICOSTEROIDS

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

SUBSTANCES PROHIBITED IN PARTICULAR SPORTS

1. ALCOHOL

Alcohol (ethanol) is prohibited in Competition only, in the following sports. Detection will be conducted by analysis of breath and/or blood. The doping violation threshold (haematological values) is 0.10 g/L. i.e. Aeronautic (FAI), Archery (FITA), Automobile (FIA), Karate (WKF), Motorcycling (FIM), Powerboating (UIM).

2. BETA-BLOCKERS

Unless otherwise specified, beta-blockers are prohibited in Competition only in the following sports: Archery (FITA) (also prohibited Out-of-Competition), Automobile (FIA), Billiards (all disciplines), (WCBS), Darts (WDF), Golf (IGF), Shooting (ISSF, IPC) (also prohibited Out-of-Competition) Skiing/Snowboarding (FIS) in ski jumping, freestyle aerials/halfpipe and snowboard halfpipe/big air,

Beta-blockers include, but are not limited to, the following: Acebutolol, alprenolol, atenolol, betaxolol, bisoprolol, bunolol, carteolol, carvedilol, celiprolol,

esmolol, labetalol, levobunolol, metipranolol, metoprolol, nadolol, oxprenolol, pindolol, propranolol, sotalol, timolol.

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