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# **HISTORY OF DOPING**

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## Motto:

- “From the beginning of human history most of the form of the rivalry has been performed with all possible means”.
- “Wherever and whenever the outcome of sporting competition has involved status, money or other similar rewards, attempts have been made to seek an advantage through doping”.

## *In the Bible :*

It has been argued that the first instance of doping occurred in the Garden of Eden when Adam and Eve ate the forbidden fruit to gain godlike powers. (*Bahrke and Yesalis, 2002*).

# Ancient reports on “doping” use in human activity

Time	Substance or method	Purpose	Region	Activity
Mythology	Bufotein extracted from psychoactive mushrooms -amanita muscaria (muscarine—a deadly alkaloid)	Stimulation	Scandinavia	Bersekens
Early history – Mid century	Ingestion of testis, heart, brain, liver, etc.	Improve vitality, bravery and intelligence	All world regions	Warriors
Pre-history	Cola accumanita, cola nitida	Improve performance	West Africa	Tribesmen
Pre-history	Ma Huang (ephedra)	Stimulation	China	Commanders

# Ancient reports on “doping” use in human activity

Time	Substance or method	Purpose	Region	Activity
VII BC	Special diet: dried figs, wine, wet cheese, meat	Improve performance	Greece	Athletes
III BC	Variety of mushrooms	Improve performance	Greece	Athletes
Roman Era	Stimulants mixed with alcohol	Overcome fatigue and injury	Roman Empire	Gladiators
Ancient America	Coca leaves, Peyote (strychnine effects)	Increase endurance, protection against mountain sickness	Peru and Mexico	Running

# Doping use for military purpose:

Year	War	Substance	Purpose	Country
1718	Norway-Sweden	Amanita muscaria	Stimulation	Norway Sweden
1863	Civil War	Morphine		USA
1883		Heroine		Germany
1939-1945	World War II	Amphetamine ("Benzendrine")	Stimulation (over 72 mln "energy tablet")	Great Britain USA
1939-1945	World War II	Ephedrine ("Pervitin")	Stimulation	Germany
1939-1945	World War II	Testosterone	Aggressiveness	Germany
1939 -1945	World War II	Blood transfusion	Adaptation to high altitude in pilots	Germany

# History of major drugs use and doping practices in sport (from: *Barrie Houlihan – “Dying to Win”*)

<b>Drug (discovered)</b>	<b>First use in sport</b>	<b>Extent of use</b>	<b>Major sports affected</b>	<b>Current level of use</b>
Amphetamines (1920s)	1940s	Heavy use between the mid 1950s and the late 1970s	Cycling, American football	Light, due to ease of identification and availability of alternatives
Ephedrine and related stimulants (1940s)	1970s	Heavy use from mid 1970s to the present	Most Olympic sports and many major team sports	Heavy
Caffeine (pre-19 <sup>th</sup> century)	Early 19 <sup>th</sup> century	Heavy in 19 <sup>th</sup> century then declined, only to increase in use from 1970s to the present day in combination with ephedrine and as a diuretic	Most Olympic sports and many major team sports	Heavy, but mainly in conjunction with other drugs

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Blood doping and rEPO (blood doping 1970s; rEPO mid 1980s)	1970s late 1980s	Moderate Light in later 1980s but rising (rEPO)	Endurance sport such as long distance cycling, running swimming and cross-country skiing	Moderate Moderate but rising (rEPO)
Barbiturates (early 20 <sup>th</sup> century)	1970s	Moderate	Modern Pentathlon (shooting)	Light
Beta-blockers (1960s)	1970s	Moderate use in small number of sports	Shooting, archery and snooker	Moderate, but use not completely banned by ISF and IOC



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Anabolic steroids and anabolic agents (1930s)	1950s	Heavy between the late 1960s and the late 1980s	Most Olympic sports and many major team sports	Heavy
Cocaine (pre-17 <sup>th</sup> century)	Late 19 <sup>th</sup> century	Heavy between the late 1960s and the present day	American football	Moderate
Human growth hormone (mid 1980s)	Late 1980s	Moderate	Body building and a similar range of sports that attract anabolic steroids users	Small but rising

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Diuretics (synthetic diuretics 1960s)	1970s (?)	Moderate to heavy in early 1970s	Weight related sports, but all sports when used as a drug to flush others out of the body	Light, due to ease of identification
Genetic manipulation (1970s)	No confirmed cases	Rumors and speculation, but no evidence of use	Potential to affect all sports	None to negligible

# Doping cases during Winter Olympic Games

Year	City	Number of tests	Substance and discipline of sport
1968	Grenoble	86	None
1972	Sapporo	211	Ephedrine-1 (Ice hockey)
1976	Innsbruck	390	Ephedrine-2 (Classic ski) Codeine -1 (Ice hockey)
1980	Lake Placid	440	None
1984	Sarajewo	424	Methandienone-1 (Classic ski)
1988	Calgary	492	Testosterone-1 (Ice hockey)
1992	Albertville	522	None
1994	Lillehammer	529	None
1998	Nagano	621	None
2002	Salt Lake City	700 (urine) 1 222 (blood)	Nandrolone-1 (Ice hockey) Metamphetamine-1 (Classic ski) Darbopoietin-3 (Classic ski) Blood transfusion-2 (Classic ski)
2006	Torino	919 (urine) 300 (blood)	Carphedon-1 (Biathlon)

# Doping cases during Summer Olympic Games

Year	City	Number of tests	Substance
1968	Mexico	667	<b>Alcohol-1</b>
1972	Munchen	2079	<b>Amphetamine -2</b> (Judo, Weight Lifting) <b>Coramine-2</b> (Cycling) <b>Ephedrine-3</b> (Swimming, Weight Lifting, Basket Ball)
1976	Montreal	786	<b>Amphetamine-1</b> (Shooting) <b>Fencafamin-1</b> (Weight Lifting) <b>Norephedrine-1</b> (Sailing) <b>AAS - 8</b> (Track and Field, Weight Lifting)
1980	Moscow	645	None
1984	Los Angeles	1507	<b>Ephedrine-1</b> (Volley Ball) <b>Nandrolone-7</b> (Weight Lifting, Track and Field) <b>Metenolone-2</b> (Basket Ball, Wrestling) <b>Testosterone-2</b> (Volley Ball, Track and Field)
1988	Seul	1598	<b>Cofeine-1</b> (Modern Pentathlon) <b>Furosemide-4</b> (Weight Lifting, Wrestling, Judo) <b>Propranolol-1</b> (Modern Pentathlon) <b>Pemoline-1</b> (Weight Lifting) <b>Stanazolol-3</b> (Weight Lifting, Track and Field)

# Doping cases during Summer Olympic Games

Year	City	Number of tests	Substance
1992	Barcelona	1848	<p><b>Strychnine-1</b> (Volley Ball)  <b>Norephedrine-1</b> (Track and Field)  <b>Clenbuterol-2</b> (Track and Field)  <b>Mesocarb -1</b> (Track and Field)</p>
1996	Atlanta	1923	<p><b>Methandienone-1</b> (Track and Field)  <b>Stanazolol-1</b> (Track and Field)</p>
2000	Sydney	2052 (urine) 307 (blood)	<p><b>Nandrolone-5</b> (Wrestling, Rowing, Weight Lifting, Track and Field)  <b>Stanazolol-1</b> (Track and Field)  <b>Pseudoephedrine -1</b> (Gymnastic)  <b>Furosemide-4</b> (Weight Lifting, Wrestling)</p>
2004	Athens	2796 (urine) 709 (blood)	<p><b>Furosemide-1</b> (Weight Lifting)  <b>Clenbuterol-2</b> (Track and Field)  <b>Etamivan- 1</b>(Rowing)  <b>Heptaminol -1</b> (Cycling)  <b>Cathine-1</b> (Boxing)  <b>Methyltestosterone-1</b> (Weight Lifting)  <b>Stanazolol-3</b> (Track and Field, Wrestling)  <b>Oxandrolone-1</b> (Weight Lifting)  <b>Testosterone -1</b> (Weight Lifting)  <b>Control refusal or manipulation-5</b> (Track and Field, Weight Lifting)</p>

## Case reports on cardiovascular complications related to AAS abuse

Diagnosis	Age/Sex	Sports	Time of abuse	Results
Myocardial infarction, with coronary thrombosis or atherosclerosis.	25/M	body builder	16 weeks	recovered
	28/M	body builder	2 years	recovered
	23/M	body builder	5 years	recovered
Myocardial infarction without coronary pathological changes.	22/M	weight lifter	6 weeks	recovered
	37/M	power lifter	7 years	recovered
	24/M	weight lifter	5 years	recovered
	21/M	body builder	5-10 years	recovered
	21/M	body builder	?	recovered
Myocarditis, myocardial perivascular and interstitial fibrosis.	24/M	football player	5 years	<b>sudden death</b>
	41/M	body builder	3 years	<b>death</b>
Hypertrophic or dilated cardiomyopathy.	21/M	weight lifter	7 months	<b>sudden death</b>
	19/M	body builder	7 months	<b>sudden death</b>
Congestive heart failure.	21/M	weight lifter	7 months	<b>sudden death</b>
	18/M	football player	?	<b>sudden death</b>
	32/M	body builder	16 years	<b>death</b>
	20/M	body builder	3 months	<b>sudden death</b>
	34/M	body builder	4 years	recovered
Stroke with seizure	21/M	body builder	6 months	recovered
Oesophageal varices	30/M	power lifter	1.5 years	recovered
Rupture of hepatic tumor	27/M	body builder	3 years	<b>death</b>
Pulmonary embolism	20/M	body builder	7 years	<b>sudden death</b>
Pulmonary embolism	36/M	power lifter	7 years	<b>sudden death</b>
Peripheral arterial events.	28/M	body builder	3 years	recovered
Myocardial infarction	21/M	body builder	5 years	recovered

# Ideas of legal pharmacological interventions

1. Pharmacosanation
2. Pharmacological support

# Pharmacosanation

During the last few decades, the pharmacology of health-**pharmacosanation** – has been developed into an independent subdivision of the applied pharmacology. A pionier in this area was a Soviet pharmacologist, Israel Breckman. **Pharmacosanation is the study of the action of biologically active substances entering a healthy body in the form of food or medicines that prevent illness, increase resistance to various adverse factors, and enhance recovery from biological stressors.**

Pharmacosanation has proven useful in helping athletes cope with the physical and emotional stresses of training and competition.



# Pharmacosanation

Historically, sport pharmacology was not acknowledged in the Western Countries. Instead, the concept of ergogenic aids and sports supplements have been prompted. **Ergogenic aids include any substances or methods believed to aid or improve athletic performance.** Most of them were borrowed from medicine and biological sciences but only few proved by experimental research to be effective and save as sports performance enhancers.

# Pharmacological support

It has been assumed that pharmacological substances applied during the pharmacological support are legal and that they are not included in the WADA List of forbidden substances and methods.

**The aim of the pharmacological support is to increase energy capacity of an organism and to balance macro- and micro elements lost in effect of strenuous exercise during training or competition.** The pharmacological support acts in synergy with a proper diet and processes of biological recovery.

Pharmacology is involved in the treatment and prevention of various pathological conditions.

Problems:

1. The legal purity of supplements
2. The ethical question of pharmacological manipulation in a healthy organism

# Development of international anti-doping system

<b>Year</b>	<b>Event</b>	<b>Outcome</b>
1964	IOC Congress, Tokyo	Condemning doping by athletes
1967	Meeting of the Committee of Ministers, Council of Europe	Resolution No 12/67 on fight against doping in sport
1968	IOC Congress	Creation of IOC Medical Commission
1984	Council of Europe	“European Charter Against Doping in Sport”
1988	IOC Meeting	IOC publishes “International Olympic Charter Against Doping in Sport”
1989	Council of Europe	European Anti-Doping Convention

# Development of international anti-doping system

<b>Year</b>	<b>Event</b>	<b>Outcome</b>
1994	IOC Congress, Paris	Publishing of the Medical Code
1999	World Anti-Doping Conference, Lausanne	Decision on creation of the World Anti-doping Agency
2003	World Anti-Doping Conference, Copenhagen	Discussion and general acceptance of the World Anti-Doping Code
2003	WADA	Publishing official version of the World Anti-Doping Code
2004	Olympic Games in Athens	Acceptance and implementation of the Code by sports movements
2005	General Conference of UNESCO, Paris	International Convention Against Doping in Sport

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