

#### Lecture 33:

# Substance Abuse in Sports (Doping) Part 1

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#### **Our missions:**

- To promote "Clean Sports".
- To fight "Childhood Obesity".
- To train and educate "highly skilled Sports Nutrition Advisors".

## Why Drug Abuse?

- Sports competitions are not athletic or pharmaceutical wars!
- Why do athletes use substances to enhance their performance?
- 1) An excessive and intense desire to become a champion.
- 2) To again economic benefits.
- 3) Profiteering by coaches and trainers.
- 4) To have a chiseled feature to brag about.
- 5) For an experience only.

## **History of Drug Abuse:**

- Cyclists abused substance in a cycling competition in 1869 in Netherlands.
- The first death reported from drug abuse in sports was in 1886: a cyclist died of trimethyl.
- Thomas Hicks won the Olympic marathon in 1904 by using a potion of Strychnine and some brandy.

- Extensive use of steroids was reported in late 1950 and early 1960.
- Stimulants of CNS especially Amphetamine was introduced to the world of medicine in 1936.
- Oslo Winter Olympic Games 1952: CNS stimulants were used for the first time.
- Rome Summer Olympic Games 1960: Danish cyclist Knud Enemark Jensen collapsed during the 100 km team time trial. He had taken Amphetamine and Roniacol.

- Tokyo Olympic Games 1964: the first Olympic games in which steroids were used.
- Atlanta Summer Olympic Games 1996: extensive of HGH and Bromantane.



# Types of Doping in Sports:

• What is Doping?

Doping is administration or consumption of any external substances or any physiologic substances of the body with unusual doses by competing athlete to enhance performance.

- Drug doping.
- Blood doping.
- Soda doping.
- Gene doping.

## Doping:

According to WADA (World Anti – Doping Agency):

- 1) SUBSTANCES AND METHODS PROHIBITED AT ALL TIMES (IN- AND OUT-OF-COMPETITION).
- 2) SUBSTANCES AND METHODS PROHIBITED IN-COMPETITION.

• 3) SUBSTANCES PROHIBITED IN PARTICULAR SPORTS.

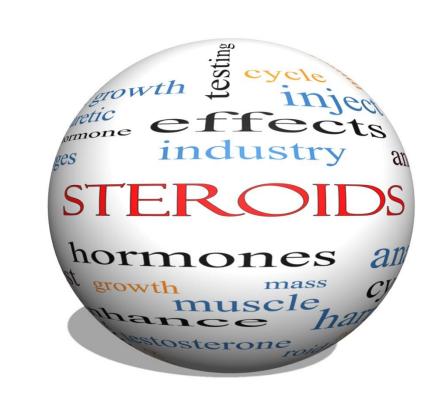
# Substances and Methods Prohibited at all time (In – and Out – of – Competition):

- 1 ) Anabolic Steroids:
- Exogenous: e.g.

Oxandrolone

- Endogenous: e.g.

Androstenediol



- 2) Peptide Hormones, Growth Factors, and Related Substances and Mimetics:
- Erythropoiesis-Stimulating Agents: e.g. EPO.
- Hypoxia-inducible factor (HIF) stabilizers: e.g. Cobalt.
- HCG (Human Chorionic Gonadotrophin).
- Corticotrophins.
- Growth hormones and its releasing hormones and peptide.

- 3) Beta-2 Agonists: e.g. Salbutamol.
- 4) Hormones and Metabolic Modulators:
- Aromatase inhibitors: e.g. letrozole
- Selective estrogen receptor modulators (SERMs): e.g. Tamoxifen.
- Anti-estrogenic substances: e.g. Clomiphene
- Myostatin modifying Agents: e.g. Myostatin inhibitors.
- Metabolic Modulators: e.g. Insulin

- 5) Diuretics and Masking agents:
- Diuretics: e.g. Furosemide.
- Making agents: e.g. probenecid.



#### 6) Non – Approved Substances:

Any pharmacological substance which is not addressed by any of the previous sections of the List and with no current approval by any governmental regulatory health authority for human therapeutic use (e.g drugs under pre-clinical or clinical development or discontinued, designer drugs, substances approved only for veterinary use).

#### **Prohibited Methods at ALL times:**

- 1) Manipulation of Blood and Blood Components:
- a) The Administration or reintroduction of any quantity of autologous, allogenic (homologous) or heterologous blood, or red blood cell products of any origin into the circulatory system.
- b) Artificially enhancing the uptake, transport or delivery of oxygen.
- c) Any form of intravascular manipulation of the blood or blood components by physical or chemical means.

- 2) Chemical and Physical Manipulation:
- a) *Tampering*, or Attempting to *Tamper*, to alter the integrity and validity of Samples collected during Doping Control: e.g. Urine substitution and/or adulteration, e.g. proteases.
- b) 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, surgical procedures or clinical investigations.

- 3) Gene Doping:
- a) The transfer of polymers of nucleic acids or nucleic acid analogues.
- b) The use of normal or genetically modified cells.



# Substances and Methods Prohibited In – Competition:

All substances and methods listed before, plus:

- 1) Stimulants: e.g. Amphetamine.
- Bupropion, caffeine, nicotine, phenylephrine, phenylpropanolamine, pipradrol, and synephrine are not considered Prohibited Substances.

- These substances are included in the 2015 Monitoring Program.

- Cathine: Prohibited when its concentration in urine is greater than 5 mcg/ml.
- Ephedrine and methylephedrine: Prohibited when the concentration of either in urine is greater than 10 mcg/ml.
- Epinephrine (adrenaline): Not prohibited in local administration, e.g. nasal, ophthalmologic, or coadministration with local anaesthetic agents.
- Pseudoephedrine: Prohibited when its concentration in urine is greater than 150 mcg/ml.

- 2) Narcotics: e.g. Oxycodone
- 3) Cannabinoids: e.g. marijuana.
- 4) Corticosteroids: e.g. prednisone.

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

# Substances Prohibited in Particular Sports:

• 1) Alcohol:

 Detection will be conducted by analysis of breath and/or blood.

• The doping violation threshold is equivalent to a blood alcohol concentration of 0.10 g/L.

 Alcohol (ethanol) is prohibited In-Competition only, in the following sports:

- Air Sports
- Archery
- Automobile
- Motorcycling
- Powerboating



- 2) Beta-blockers: e.g. atenolol
- They are prohibited In-Competition only, in the following sports, and also prohibited Out-of-Competition where indicated by\*:
- Archery \*
- Automobile
- Billiards (all disciplines)
- Chess
- Darts
- Golf
- Shooting \*
- Skiing/Snowboarding: ski jumping, freestyle aerials/halfpipe and snowboard halfpipe/big air
- Underwater sports.

### **Homework:**

- 1) Describe doping and types of doping.
- 2) Describe substances and methods that are banned during sports competitions only.

