

# Health Risks & Side Effects of Performance Enhancing Drugs

Anti-doping programmes seek to protect the health of athletes and to provide the opportunity for athletes to pursue human excellence without the use of prohibited substances and prohibited methods. Health is on the top of the list of rationales for the World Anti-Doping Code.

## The Prohibited List

The Prohibited List is published by the World Anti-Doping Agency (WADA) annually, identifying the substances and methods prohibited in- and out-of-competition, in particular sports and the substances of abuse.

Any substances or methods meeting the following criteria could be included on the Prohibited List.

- Two of these criteria are met:
  - Potential to enhance sport performance;
  - The use represents actual or potential health risk;
  - The use violates the spirit of sport.
- Potential to mask the use of prohibited substances and prohibited methods

## Health Risks

Use of any performance enhancing drugs (PED) may cause serious health problems and adverse side effects because:

- Some of PEDs are intended for therapeutic purposes and they should only be prescribed by physicians only. It will pose serious health risks if athletes use these substances when it is not medically necessary.
- Prolonged use of drugs or taking a combination of drugs may cause permanent damage to the body.
- Some PEDs can create both physical and psychological dependence. Withdrawal symptoms may occur when the drug is discontinued.

## Commonly-abused Performance Enhancing Drugs

### Anabolic Agents | Prohibited at all times (both in- and out-of-competition)

Anabolic agents (e.g. steroids) are synthetically produced substances which mimic the effects of testosterone (a hormone naturally derived in the body). Anabolic steroids increase protein synthesis, enhance muscle and bone growth. They also have androgenic effects, including the development and maintenance of masculine characteristics such as the growth of the vocal cords and body hair.

#### Side Effects

Steroids can impose serious side effects on a person's health. Most of these side effects are dose-dependent. In general, steroids increase the risk of cardiovascular disease, liver disease, and high blood pressure. Common psychological/behavioral changes include mood swings, aggression, mania, depression, and dependence. Using steroids may result in acne and permanent baldness. For male users, it also leads to breast tissue development, shrinking of testicles and decrease in sperm production. In females, steroids can cause the growth of facial hair, deepening of the voice and abnormal menstrual cycles. In children, administration of steroids can cause stunting of growth and pre-mature puberty.

### Stimulants | Prohibited in-competition only

Stimulants (e.g. amphetamine and cocaine) are substances that act on the central nervous system. Stimulants can increase alertness, reduce tiredness, increase competitiveness and aggression in athletes.

#### Side Effects

The use of stimulants can lead to dehydration, anxiety, insomnia and increased heart rate. It also affects the coordination and balance. Prolonged use may increase the risk of cardiovascular problems and stroke.

### Erythropoietin | Prohibited at all times (both in- and out-of-competition)

Erythropoietin (EPO) is a peptide hormone produced by the body that stimulates the production of red blood cells. EPO can stimulate the bone marrow to produce more red blood cells in order to increase the oxygen carrying capacity of the blood. The use of EPO can increase exercise endurance and reduce recovery time.

#### Side Effects

EPO makes the blood more viscous and causes blood pressure to rise. It will increase the risk of heart attack, stroke and pulmonary embolism, which may result in death.

### Cannabinoids | Prohibited in-competition only

Cannabinoids are substances that can be found in the dried flowers, leaves or resin of the Cannabis plant. Cannabis produces the feeling of euphoria and relaxation.

#### Side Effects

The use of cannabis affects the brain which causes mood swings, feelings of anxiety or paranoia. It also reduces memory and ability to concentrate. Other effects on the body include impaired balance and co-ordination, drowsiness and dryness of mouth. Long term risks of cannabis use may include weakened immune system, increased risk of lung, mouth, tongue, and throat cancer.

## Other Common Prohibited Substances / Prohibited Methods and their Potential Side Effects

### Substances and Methods Prohibited at All Times (In- and Out-of-competition)

Substance	Potential Side Effects
Beta-2 Agonists	Increased heart rate and blood pressure, sweating, nausea and tremors
Hormone and Metabolic Modulators (e.g. Anti-estrogenic Substances)	Hot flushes, sweating, insomnia and osteoporosis
Diuretics and Other Masking Agents	Dehydration, muscle cramps, drop in blood pressure, electrolyte imbalance, dizziness or fainting

Method	Potential Side Effects
Manipulation of Blood and Blood Components	Increased risk of infection, development of blood clot, heart attacks, strokes and pulmonary embolism

Gene and cell doping	The technology is new and dangerous. Side effects are unpredictable
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### Substances Prohibited In-competition Only

Substance	Potential Side Effects
Narcotics	<ul style="list-style-type: none"> <li>Increase pain threshold and failure to recognize injury, weakened immune system, decreased heart rate and suppressed respiratory system</li> <li>Loss in balance, coordination and concentration</li> <li>Highly addictive leading to physical and psychological dependence</li> </ul>

Glucocorticoids	Loss of muscle mass, reduced bone density, hyperglycemia, weight gain, gastric ulcer and immunosuppression
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### Substances Prohibited in Particular Sports

Substance	Potential Side Effects
Beta-Blockers	<ul style="list-style-type: none"> <li>Lowered blood pressure, slow heart rate</li> <li>Fatigue, depression, sexual dysfunction</li> </ul>

This is not the full list. For complete and detailed information, please refer to the current Prohibited List (the List can be downloaded on HKADC website).

**Disclaimer:** This pamphlet is published for reference purpose only, and is not intended to give any legal / medical advice by HKADC who shall disclaim any liability arising therefrom. Relevant individuals are recommended to refer to the Anti-Doping Rules of HKADC, and seek for professional / legal advice on important decisions.

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