

# Anabolic Steroid Use by Athletes: Practices and Consequences

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Muli Epstein

Ribstein Center for Sports Medicine  
and Research, Wingate Institute



# A Brief History Of Anabolic Steroids

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- ❑ Greek wrestlers - meat to build muscle
- ❑ Norse warriors - hallucinogenic mushrooms
- ❑ The first competitive athletes - swimmers in Amsterdam in the 1860s
- ❑ Testosterone was first synthesized in the 1930's
- ❑ The Germans first experimented on dogs than on their own soldiers
- ❑ Introduced into the sporting arena in the 1940's and 1950's
- ❑ In the 1950' Russian began dominating in power lifting

## Cont.

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- ❑ 1960 - The first death in the Olympic games (Kurt Jensen - Amphetamines over dose)
  - ❑ 1967 - The IOC took action after the death of Tommy Simpson
  - ❑ 1968 - The IOC decided on a definition of doping and developed a banned list of substances
  - ❑ Testing began at the Olympic games

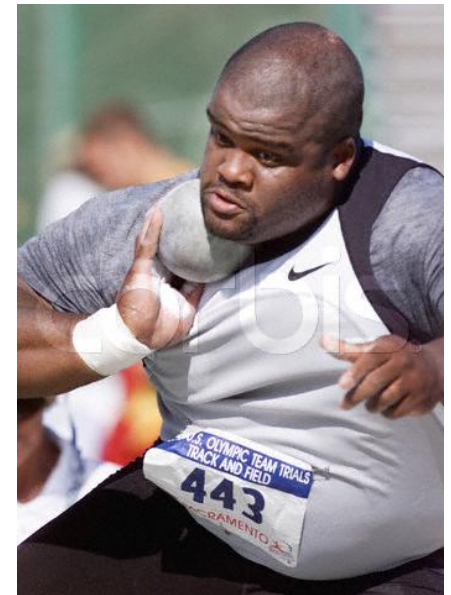
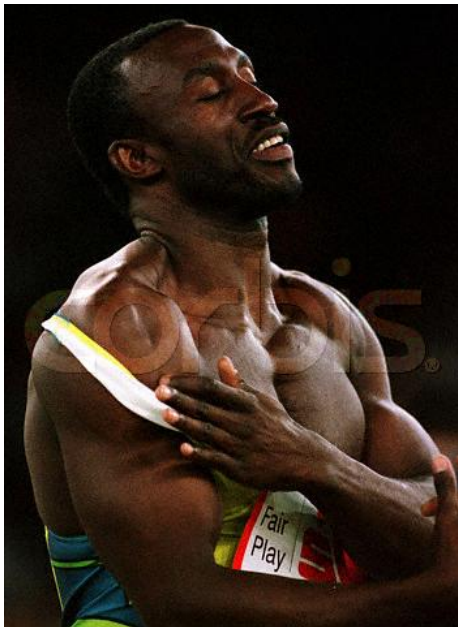




# Prohibited List – WADA 2006

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- **Anabolic Agents**
- **Stimulants**
- **Narcotics**
- **Cannabinoids**
- **Hormones and related substances**
- **Beta-2-Agonists**
- **Agents with Anti-Estrogenic Activity**
- **Diuretics and other Masking Agents**
- **Enhancement of Oxygen Transfer**
- **Chemical and Physical Manipulation**
- **Gene Doping**





**Steroids** are used to:

- Increase muscle bulk:

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1. Shift the nitrogen equilibrium, this gives better utilisation of ingested proteins and increased retention of nitrogen - a temporary effect that requires a high-protein complementary diet but leads to an increase in muscle bulk
2. Formation of a steroid receptor, leads to an increase in protein synthesis
3. Compete for glucocorticoid receptors, this blocks the inhibition of protein synthesis which occurs after exercise.

- Increase in the amount of time  
and  
the intensity that an athlete can train



## Why are they abused?

Anabolic steroids are primarily used by bodybuilders, athletes, and fitness “buffs” who claim steroids give them a competitive advantage and/or improve their physical performance

Steroids are purported to increase lean body mass, strength, and aggressiveness

Steroids are also believed to reduce recovery time between workouts



# How are they taken ?

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- intramuscular
- subcutaneous injection
- by mouth
- by application to the skin (e.g. gels or patches)






# How are they taken?

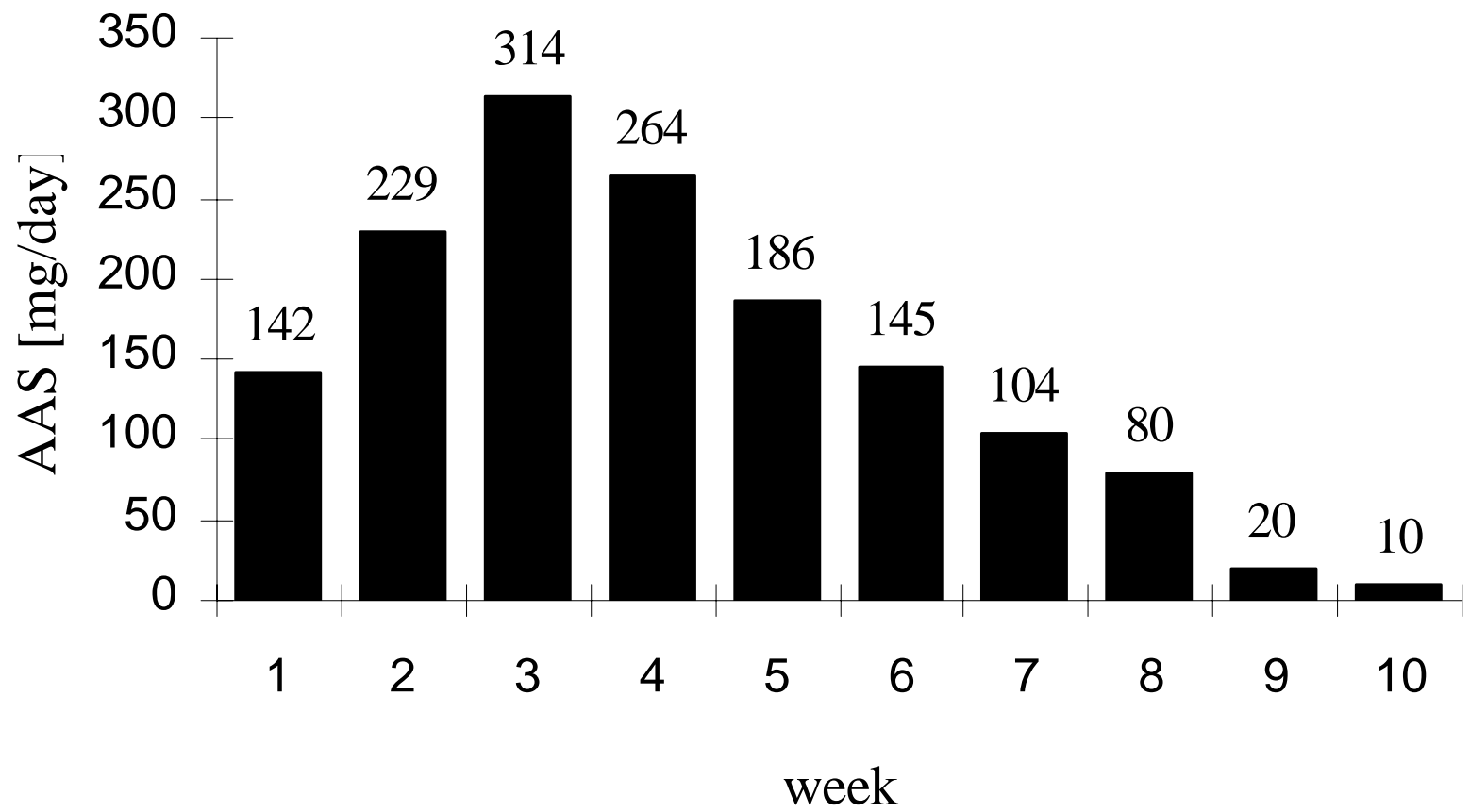
(Cont.)

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- 1 to upwards of a 100 times normal therapeutic doses of anabolic steroids
- two or more steroids concurrently, a practice called “stacking”
- alternate periods (6 to 16 weeks in length) of high dose use of steroids with periods of low dose use or no drug at all. This practice is called “cycling”
- “pyramiding”
- Doses of anabolic steroids used will depend on the particular objectives of the steroid user



Week	<b>Anapolon</b> (Oxy-metholone)	<b>Sustanon</b> (4 Testosterone-esters)	<b>Deca</b> (Nandrolone-decanoate)	<b>Dianabol</b> (Metandienone)	<b>HCG</b>
1	50 mg/d	250 mg/w	400 mg/w		
2	100 mg/d	500 mg/w	400 mg/w		
3	150 mg/d	750 mg/w	400 mg/w		
4	100 mg/d	750 mg/w	400 mg/w		
5		750 mg/w	200 mg/w	50 mg/d	5000 IU/w
6		500 mg/w	200 mg/w	45 mg/d	5000 IU/w
7		250 mg/w	200 mg/w	40 mg/d	
8		250 mg/w	100 mg/w	30 mg/d	
9				20 mg/d	
10				10 mg/d	5000 IU/w
11					5000 IU/w
12					5000 IU/w



Substances which are taken during and after a longterm application of AAS to fight against their side effects.

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substance	effect
HCG	stimulation of testosterone synthesis
Tamoxifen-Citrat (Nolvadex)	antiestrogen
Clomiphen-Citrat (Clomid)	stimulation of testosterone synthesis, Antiestrogen
Clenbuterol	increase of lipolysis, increase of muscle mass
Aminoglutethimid (Cytadren)	antiestrogen; anticatabolic effect
Cycofenil (Fertodur)	stimulation of testosterone synthesis, antiestrogen

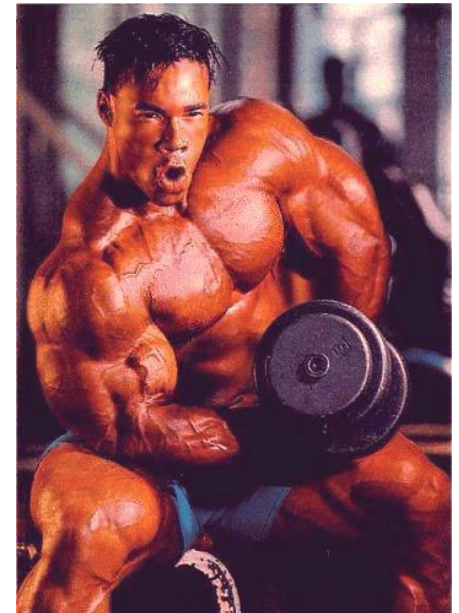
# Anabolic Agents

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## 1. AAS –

A. Exogenous - clostebol, fluoxymesterone, metandienone, metenolone, nandrolone, stanozolol

B. Endogenous – androstenedione, DHEA, testosterone



## 2. Other Anabolic Agents –

Clenbuterol, Zeranol, Tibolone, Zilpaterol





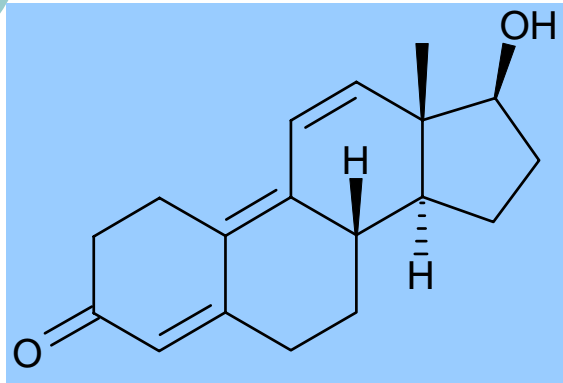
# Designer Steroids - THG

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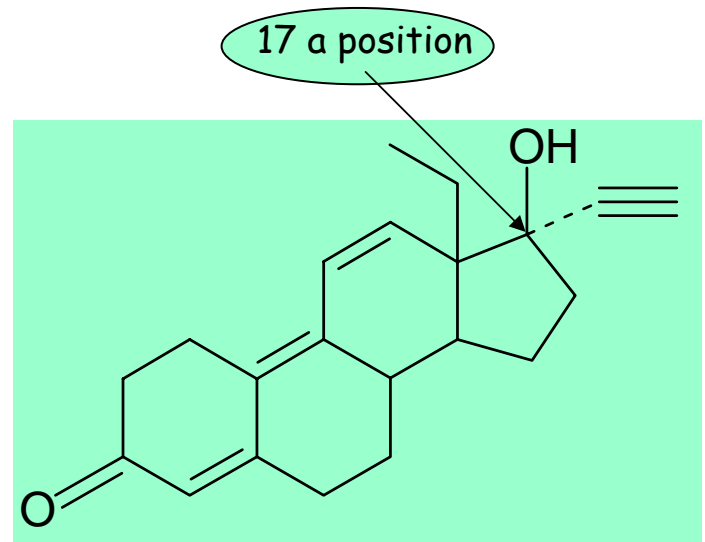


# What is Tetrahydrogestrinone ?

- An anabolic steroid based on the steroids **Trenbolone** and **Gestrinone**
- both of the parent compounds are only suitable to be administered by injection



Trenbolone



Gestrinone

By modifying the 17a position THG was able to be administered orally.

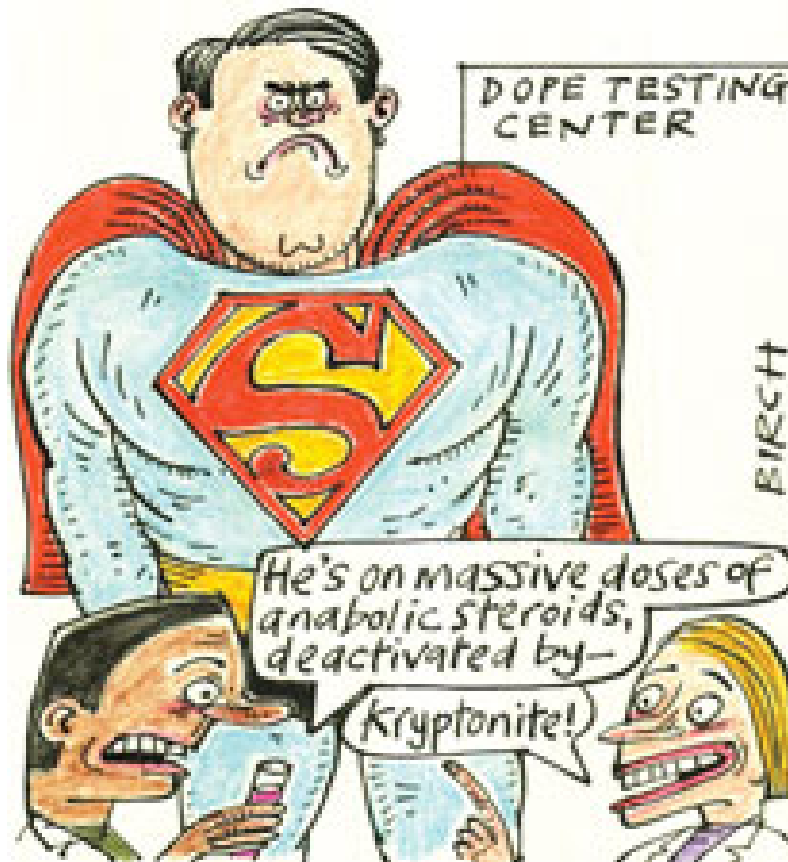
THG is a very strong steroid

- increasing the chance of liver damage

# The Dangers of Steroids.

Apart from getting caught. ○

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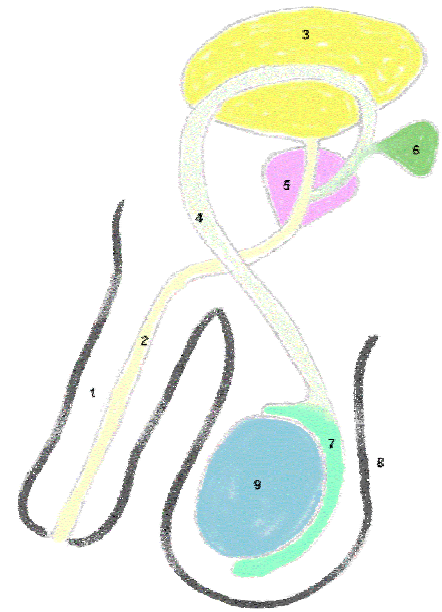
# Short-Term Effects

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The major effects of anabolic steroid use include liver tumors, jaundice, fluid retention, and high blood pressure

**For men**, additional side effects include:

- shrinking of the testicles
- reduced sperm count
- development of breasts
- baldness
- infertility



# Short-Term Effects (cont.)

**For women**, additional side effects include:

- growth of facial hair
- deepened voice
- changes in or cessation of menstrual cycles

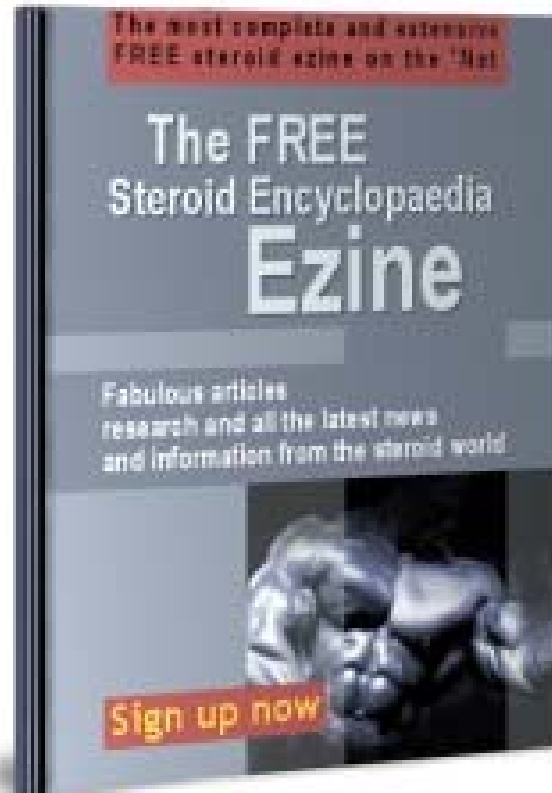
**For adolescents**, additional side effects include:

- accelerated puberty changes
- growth halted prematurely (due to premature skeletal maturation)



# Black Market

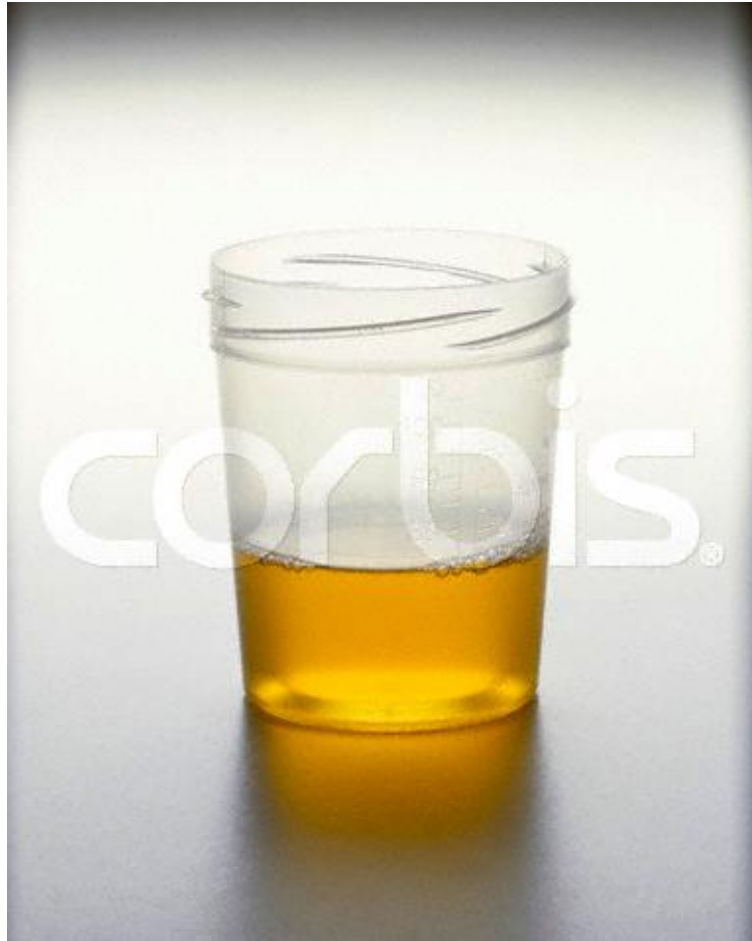
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# Detection and Cheating

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# Catheter

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**Thank you for your attention!!!**

