

# Testosterone and anabolic steroid abuse – side effects

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Testosterone is an endogenous androgenic hormone, or in other words, a male hormone produced in the human body. Anabolic steroids are its synthetic derivatives. These drugs can only be used for therapeutic purposes, including the treatment of osteoporosis. It is estimated that there are currently between 5,000–10,000 anabolic steroid abusers in Finland. They often use these substances periodically to increase muscle mass. The abuse can cause hormonal imbalances and a number of serious medical and psychiatric conditions, including infertility, cardiovascular disease, liver damage and depression.

## Medical uses

Both testosterone and anabolic steroids are classed as doping substances under the decree (705/2002) amending Chapter 44, Section 16, Clause 1 of the Finnish Penal Code. They are prescription-only medicines and can only be used to treat medical conditions as authorised by the Finnish health authorities.

These include primary and secondary hypogonadism, anaemias, osteoporosis and a number of chronic conditions associated with protein deficiency and in the event of impaired tissue regeneration. Testosterone is also used in the symptomatic treatment of the male menopause.

Testosterone is administered by injection as testosterone esters (including testosterone propionate, testosterone enanthate, testosterone phenylpropionate, testosterone isocaproate and testosterone undecanoate) and orally as testosterone undecanoate capsules. Anabolic steroids are available in injectable or tablet form.

## Abuse

It is estimated that some 5,000–10,000 people in Finland abuse testosterone and anabolic steroids. Anabolic steroid abusers tend to be males aged between 20 and 35. Their key motivation for the abuse is to increase their muscle mass and enhance their appearance. Steroids are additionally used to garner respect in the weightlifting community. Competitive weightlifters use these banned substances to improve their competition performance.

The abuse of anabolic steroids tends to be periodic and intermittent. The periods of abuse range from a few weeks to several months, with breaks of a few months in between. The dose is increased gradually and the use is discontinued in stages over a 1–2 week period. Excessive doses are a feature of abuse.

### Side effects: hormonal imbalances

When excessive levels of testosterone and anabolic steroids are introduced to the body, they cause a hormonal imbalance.

In men, this suppresses endogenous hormone production and leads to the structural degeneration of the endocrine organs and glands, including the gonads. The periods of abuse are followed by infertility and loss of sexual function.

In women, testosterone and anabolic steroids cause excessive hair growth, deepening of the voice, reduction in breast size, hair loss, clitoral hypertrophy, acne and disruptions in the menstrual cycle. Some of these changes may be permanent.

Young people who are still developing physically may suffer from stunted growth as a result of testosterone and anabolic steroid abuse.

### Side effects: serious medical conditions

When used in excessive doses, both testosterone and anabolic steroids cause harmful changes in cholesterol levels. In the long-term, persistent use will increase the risk of cardiovascular disease and strokes. Steroids restrict the heart's ability to contract, leaving users susceptible to arrhythmias and sudden death.

In addition, the misuse of these hormone preparations increases the risk of diabetes. Sharing needles to inject them also increases the risk of blood-borne infections, including different types of hepatitis and HIV.

The excessive use of testosterone and anabolic steroids also increases the risk of cancers and liver damage. Anabolic steroids administered orally are more damaging to the liver than if they are injected. Liver disease can vary from temporary minor cell damage and jaundice to malignant hepatic tumours, which even when treated are associated with a poor prognosis.

#### Side effects: mental health

Testosterone and anabolic steroids also affect the functioning of the central nervous system (CNS), particularly the areas controlling mood, sexuality and aggression.

Some 20–30% of people who consume excessive amounts of testosterone and anabolic steroids exhibit symptoms of psychiatric illness during the intake period, including depression, anxiety, and psychotic reactions including hallucinations, hypomania and cognitive impairment.

Some 30% of people who consume excessive amounts of anabolic steroids exhibit aggressive behaviours, hostility and irritability during the intake period. A number of case reports have argued that the hormones are responsible for impaired impulse control. These include reports of previously stable individuals becoming violent and committing manslaughter following hormone consumption.

The findings of a Finnish population-based study suggest that for people abusing anabolic steroids and testosterone the risk of premature death is 4.6 times higher than for the control group.

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