

## Steroid/Sports Drug Testing / *frequently asked questions*

### Why Redwood Toxicology Laboratory?

Redwood Toxicology Laboratory (RTL) is one of the largest, full-service, independent drug and alcohol testing laboratories in the United States. RTL utilizes state of the art screening and confirmation methodologies for urine and oral fluid drug testing and is trusted by over 7,000 customers.

RTL now offers comprehensive state of the art anabolic steroid, diuretic and stimulant testing in urine. Advantages of using RTL include:

- Extensive experience in performing forensic toxicology analysis for alcohol and drugs of abuse,
- Highly qualified scientific staff,
- Tests performed on state of the art instrumentation,
- Excellent client services, and;
- Extensive quality assurance and quality control procedures that help to ensure accurate results.

### What are anabolic steroids?

Androgenic-anabolic steroids (AAS) are a class of steroid hormones with dual pharmacological actions: androgenic (promote development of male sexual characteristics) and anabolic (increase nitrogen retention, protein synthesis, muscle growth in the body).

Testosterone, the principal endogenous AAS, is produced in the testes by males and in the adrenal glands by both males and females.

Synthetic AAS are the chemical alterations of testosterone. They are designed to slow down metabolism in the body, enhance or reduce either anabolic or androgenic properties relative to testosterone, improve bioavailability and prolong the action of the drug.

AAS have limited medical use, but are abused as performance enhancing drugs in sports and more recently in some professional areas, where strong muscular appearance is important. In the general population, especially among adolescents and young adults, AAS are abused as a cosmetic tool helping to create attractive muscular bodies and to improve the physique.

AAS have been classified as Schedule III Controlled Substances in the United States since 1991. Side effects include suppression of endogenous hormone production, gynecomastia (female type breast growth in males), acne, liver toxicity, mood swings, aggression, infertility and masculinization in females: deepening of the voice, male type hair growth.

### What are prohormones and designer steroids?

The number of available prescription anabolic steroids has not changed since the late 1960's. However, since 1997 many new AAS have been released into circulation as nutritional supplements. They are commonly known as prohormones and designer steroids.

The term Prohormone has been used during the last decade to designate a substance (dietary supplement), which readily converts in the body into an illegal anabolic steroid. The most common prohormones are precursors of such anabolic steroids as testosterone, nandrolone (19-nortestosterone) and boldenone (1-dehydrotestosterone). These prohormones are now specifically banned and are included as an amendment to the Controlled Substances Act of January 2005.

More recent generations of anabolic dietary supplements feature synthetic designer anabolic steroids. Most of them were developed and studied more than 40 years ago, but have never been approved or marketed as legitimate drugs. As such, they have not been specifically listed as Controlled Substances. Legislation is catching up with these designer steroids as well.

### How will my agency benefit by choosing RTL's Steroid/Sports Drug Test?

Key benefits of using RTL's Steroid/Sports Drug Test include:

- Most comprehensive panel available, detects full list of prescription androgenic anabolic steroids, prohormones, designer anabolic steroids, essential masking, anti-estrogen agents, diuretics and stimulants
- RTL Steroid/Sports Drug Testing is comparable to World Anti-Doping Agency (WADA) testing
- Toxicologists with a high level of expertise in athletic drug testing, including extensive experience in the Olympic laboratory
- Best turn-around time in the industry
- Ideal for high schools, colleges, professional testing and sports federations.
- Tests are performed by GC/MS on state of the art equipment for accuracy and reliability
- Results available by internet, fax and U.S. mail
- Toll-free customer support and training services
- Expert witness and affidavit services available

### What else is included in the RTL Steroid/Sports Drug Test?

RTL's Steroid/Sports Drug Test also includes a popular non-steroid anabolic agent, Clenbuterol; two masking agents, Probenecid and Epitestosterone; and two anti-estrogens, Formestane and Testolactone. These drugs are also banned in sports.

Probenecid is a uricosuric drug. It restricts steroid excretion into urine, making detection difficult. Epitestosterone may be used as a masking agent to balance excessive testosterone levels after testosterone ingestion, in order to keep the T/E levels below the cut-off limit of 6.

Anti-estrogens are often used to counteract so-called aromatization, conversion of excessive amounts of abused testosterone into female hormones, estrogens. Estrogens cause unpleasant effect in males such as female type breast growth.

### **What steroids on the test panel are popular?**

Statistically, nandrolone, testosterone and stanozolol are found in routine testing more often than the others. However, consumer preferences vary depending on supply. Boldenone became very popular, when its precursor was released into the supplement market and was heavily advertised in the media. It was followed by the efficient anabolic steroid, 1-testosterone and its precursors. Then methyl-1-testosterone appeared as an even stronger drug. Each new generation of designer steroids seems to be more efficient pharmacologically than the previous ones. The most recent designer steroids, desoxymethyltestosterone, methasterone, prostanazol and 6-methylandrosterone, are now often seen in routine testing.

### **Why are some steroids on the RTL steroid panel grouped together?**

Some steroids, when ingested, convert into each other forming an identical set of urinary metabolites. It is impossible to determine which drug in the group was administered.

### **Why are steroids screened by GC/MS?**

Most steroids break down in the body into multiple metabolites that are excreted in urine at low concentrations. These substances are similar to each other and to the endogenous steroids, normally present in urine in higher concentrations. RTL performs GC/MS screening for the Steroid Test because it provides an efficient separation and specific detection of individual compounds.

The GC/MS confirmation procedure is specific to each individual steroid. For multiple positive screens, multiple individual confirmations are set up. Specimens that screen positive are also confirmed by GC/MS using a separate aliquot of urine.

### **How accurate and reliable is the RTL Steroid/Sports Drug Test?**

RTL utilizes the most sophisticated, sensitive, and specific equipment and technology available. This methodology provides highly accurate results. The RTL Steroid Test shows what steroids or metabolites are present in the urine at the time the sample was collected. In most cases, confirmation is based on positive identification of more than one metabolite (metabolic pattern), providing added confidence. Accurate quantification is performed for nandrolone and testosterone with cut-off levels of 2 ng/mL (nandrolone metabolite) and testosterone to epitestosterone ratio above 6 (T/E > 6).

### **What is the T/E ratio?**

Testosterone and its precursors may be endogenous (produced in the body naturally) or exogenous (ingested as drugs or supplements). The T/E ratio is used to distinguish between the two. This ratio is a urine concentration ratio of two steroids, testosterone (T) and its natural isomer, epitestosterone (E). The normal average ratio is approximately 1, with individual variation on both sides, either higher or lower.

Ingestion of exogenous testosterone or its precursors suppresses internal steroid production in the body. Both endogenous T and E would be suppressed. However, total testosterone concentration in urine will rise above normal due to ingested drug. Low E and high T cause the T/E ratio to rise above 6 (cut-off), indicating testosterone abuse.

### **How long can steroids be detected in urine?**

Detection time may vary from a few days (short-term pill) to as long as 12-18 months (oil-based injection), depending on the pharmacological form used, route of administration, length of usage and quantity. Individual differences may also contribute to the duration of the drug in the body. Test results cannot show when the drug was used, i.e. how long before the urine was collected.

### **What are diuretics?**

Diuretics elevate the rate of bodily urine excretion (diuresis). All diuretics increase the excretion of water from the body, although each class of diuretics does so in a distinct way employing different mechanisms of action. Use of diuretics is prohibited in sports. Increased urine flow would reduce concentrations of banned performance enhancing substances in urine such as anabolic steroids, thus complicating their detection in doping control (masking). In sports where weight categories are involved diuretics are abused as weight reducing agents. Diuretic abuse in sports is unethical and dangerous for athlete health (dehydration). Diuretic testing is a part of routine doping control in sports.

### **What are stimulants?**

Stimulants are psychoactive drugs that induce temporary improvements in mental and/or physical function. The effects of stimulants include enhanced alertness, wakefulness, endurance, productivity and motivation; increased arousal, locomotion, heart rate/blood pressure; and a perception of a diminished requirement for food and sleep. Stimulants include the following: amphetamine, methamphetamine, cocaine and ecstasy (MDMA), which are classified as drugs of abuse in the US; ephedrine and its derivatives, which can be found in many cold medications; and many other prescription drugs and illicit substances used worldwide. Stimulant abuse can lead to addiction and is eventually destructive to human health.

### **How stable are steroid metabolites in urine?**

Refrigerated or frozen urine shows very little or no steroid metabolite degradation during prolonged (several years) storage.

### **How much does RTL's Steroid/Sports Drug Test cost?**

For information about steroid/sport drug test pricing, contact the RTL sales staff toll-free at (800) 255-2159.

### **How will RTL report results?**


RTL offers steroid reporting by internet ([www.webtoxicology.com](http://www.webtoxicology.com)), U.S. mail or facsimile. Please indicate your preferred method at the time of account set-up.

### **How to sign up for Steroid/Sports Drug Testing?**

Contact RTL to set up your account. Let us know that you are interested in Steroid/Sports Drug Testing and indicate any other drugs of abuse you would like to test. Compliance with RTL non-pretesting policy is required. Call us toll-free at (800) 255-2159.



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