

## Liver Function Tests

Liver function tests (LFT) are complicated and, despite the name, is a measurement of damage rather than function. When a cell in the liver is damaged it leaks or bursts. The content of the cell is disgorged into the blood stream. It is the enzymes, which should be in healthy liver cells, which are detected in an LFT. A lot of the confusion I see regarding liver function tests stem from using American values, most notably on internet forums. Below are the UK values.

Albumin is a protein made in your liver. This test measures how well your liver is making the proteins that your body needs. Low albumin levels can be a sign of liver damage.

Alkaline Phosphatase (ALP or "alk phos") is an enzyme found in large amounts in your liver, next to bile ducts. High levels of ALP can be a sign of liver or bile duct damage.

Alanine Transaminase (ALT) is an enzyme mainly found in your liver. High levels of ALT in your blood can be a sign of liver damage and is commonly associated with Hepatitis C infection. Antibody screening for this virus is strongly recommended in the event of raised ALT.

Bilirubin is a yellow fluid made in your body when red blood cells break down. If your liver is damaged, bilirubin can build up in your blood and cause jaundice (yellowing of skin and eyes).

Gamma-glutamyl transpeptidase (GGT) is an enzyme found in large amounts in your liver. High levels of GGT can be a sign of liver or bile duct damage. Raised values are typically seen in alcohol abuse.

Very often raised liver enzymes are seen as a direct result of oral steroid use.

Your liver is big. It needs to be as it does about 500 jobs including the storage of glycogen, an excellent source of fuel for the body made from sugar. Glycogen is rapidly converted to glucose when required, which is often. It's all your energy hungry brain will ever eat. The liver is a detoxification plant, breaking down toxins, poisons and removing harmful substances. It is also involved in manufacturing and regulating numerous hormones including sex hormones.

When the liver goes wrong it can be quite spectacular. It is a deeply specialised area of medicine that those with a certain inclination can dedicate an entire career to. I'm aiming for 900 words.

Alcohol and Hepatitis C are two major culprits for causing liver damage in the UK. The use of oral anabolic steroids is having an impact too. And not necessarily just illicit steroids, but pro-hormones, natural steroids, testosterone boosters and other "legal" designer steroids. They are also known as 'grey-market drugs' as they're not strictly illegal, it's just that the law hasn't caught up with them yet, so are continually evolving. I'm becoming increasingly convinced these substances are every bit as bad for health as oral AAS drugs, if not actually worse. In Hawaii, 2013 there were 30 reported cases of liver damage, two requiring liver transplants and one death, attributed to the fat loss supplement OxyELITE Pro.

Oral drugs get hammered by the liver soon after they're swallowed. The drug is absorbed from the GI tract and passes via the portal vein into the liver where they're metabolised. This is called first pass metabolism and means that only a small proportion of the drug reaches the circulation.

To outsmart this stunningly practical organ, drugs are altered to survive this onslaught. Most oral steroids are chemically changed to resist being broken down and destroyed. Some wizardry has been performed on the 17<sup>th</sup> carbon atom of the steroids molecular structure, hence the term 17-alpha-alkylated steroids. Quite a clever piece of chemistry, but potentially disastrous for the liver. These substances are hepatotoxic (toxic to the liver). Now the tables have turned and it's the liver on the receiving end.

Another important function of the liver is to produce bile, an unsightly greenish-yellow fluid which helps to digest fats. Bile normally passes through the liver via bile ducts to the gall bladder. A decrease in this flow can be caused by an obstruction either inside the liver or just outside nearby. This is called cholestasis which is Greek for "bile standing still". Numerous cases of cholestasis have been attributed directly with oral AAS use and the onset is disturbingly rapid.

Symptoms include jaundice, pale stools *and* dark urine, abdominal pain (especially the upper right side), fever and very itchy skin. Do not ignore these symptoms.

Irresponsible long term oral AAS use (I'm talking years now) can result in a chronic vascular injury to the liver where it becomes covered in blood filled cysts (peliosis hepatitis). Worse still are hepatic tumours which can be either benign (adenomas) or cancerous.

What about using compounds to try and offset any potential damage? A 2015 report in the American Society of Andrology and European Academy of Andrology states "some patients have reported the use of dietary supplement products branded as 'liver protectors', believing that these products mitigate the hepatotoxicity of the 17-alpha-alkylated compounds. These 'liver protectors' typically contain N-acetylcysteine, milk thistle extract and other herbs, none of which have been demonstrated to have any protective effect against oral androgen induced hepatotoxicity". Put simply, they don't work.

This should make it abundantly obvious not to wolf down handfuls of oral anabolic steroids for any extended period or in large quantities. If used at all, minimise their use to a period no longer than 6 weeks. Do NOT use them in conjunction with other tablets, medications or alcohol.