

# FACT SHEET 40

## LIVER FUNCTION TESTS

The liver plays a key role in the removal of waste and poisons from the circulating blood, these toxins are then modified and excreted from the body. Around 98% of alcohol is removed from the body in this way, with the remaining 2% being excreted through exhalation and perspiration.

Alongside the general toxic effects alcohol has on cells in the body it also causes changes in the metabolism of fats. Both of these factors contribute to alcohol related liver problems. Although the liver can repair itself to some extent, heavy or prolonged use of alcohol can lead to more serious and irreversible changes to the liver tissue that may lead to potentially fatal liver damage such as cirrhosis or liver cancer.

### Liver Function Tests

To determine whether the alcohol has caused any changes or damage to the liver, people who have been drinking heavily or using alcohol regularly are advised to have a Liver Function Test – an LFT. An LFT involves taking a blood sample and examining it for changes to the cells and the proteins in the blood, the results can provide a useful indication as to what is happening in the liver. However, it is worth remembering that they do not provide the full picture and further investigation is usually required to give an accurate diagnosis.

The types of proteins measured in an LFT may include some or all of the following - Albumin, Alkaline Phosphatase (ALP), Alanine Transaminase (ALT), Aspartate Aminotransferase (AST), Bilirubin and Gamma-Glutamyl Transpeptidase (GGT). The Mean Corpuscular Volume (MCV) can also be used as an indicator of alcohol abuse when used alongside the results for the above proteins. The MCV measures the average size of the circulating Red Blood Cells (RBC), excessive alcohol consumption generally leads to an increase in the volume of the RBC and therefore a raised MCV measure.

### What do my Results Mean?

#### Albumin

*Normal Range = 30 – 52 grammes per litre of blood*

Albumin is important for transporting molecules in the blood and also plays a crucial role in maintaining the pressure of the blood, preventing it from leaking out of the blood vessels into the extracellular tissues. Albumin is produced by the liver, therefore

decreased levels may indicate liver damage or disease, however, low level blood albumin may also be indicative of kidney damage or malnutrition.

### **Alkaline Phosphatase (Alk. Phos. or ALP)**

*Normal Range = 40 – 280 IU per litre of blood*

Although Alkaline Phosphatase is in all tissues, this enzyme is usually found at high concentrations in the liver, in bone, in the placenta and in bile ducts. Increased blood ALP can indicate damaged or diseased liver tissue but is also seen during normal bone growth, in anaemia, leukaemia and as a result of taking certain medications. ALP exists as a number of different forms that are tissue specific, so further laboratory analysis can determine whether the increased ALP in the blood is from the liver, the bile ducts, placenta or bone.

### **Alanine Transaminase (ALT)**

*Normal Range = 5 – 50 U per litre of blood*

This enzyme is involved in the metabolism of the amino acid Alanine, it resides in a number of tissues but is found at the highest concentrations in the liver. If the liver cells are damaged or diseased they release this enzyme into the blood resulting in an increase in ALT levels that would be detected by an LFT.

### **Aspartate Aminotransferase (AST)**

AST is a measure that is rarely taken but may be used in some cases to obtain further information. This enzyme is involved in the metabolism of the amino acid Aspartate, it resides in a number of tissues but is found at the highest concentrations in the liver, heart muscle and skeletal muscle. When cells are damaged or diseased they release this enzyme into the blood resulting in elevated AST measurements. However these elevated enzyme levels may be indicative of pancreatitis, kidney failure, a number of heart disorders, skeletal muscle damage and disease as well as liver damage.

### **Gamma-Glutamyl Transpeptidase (Gamma-GT, GGT)**

*Normal Range = 10 – 70 U per litre of blood*

GGT is common in the kidneys and bile duct as well as the liver, it is one of the main enzymes used as an indicator of alcohol abuse, working best in conjunction with MCV and ALT. GGT is involved in glutathione metabolism and also plays an important role in transporting other amino acids across the cell membrane. As well as being used as a marker for liver damage, elevated levels of this enzyme can also be indicative of heart failure, renal disease, pancreatitis and blocked bile ducts. Smoking, obesity, diabetes and the use of some groups of drugs can also lead to elevated levels of GGT.

### **Bilirubin**

*Normal Range = upto 17umol per litre of blood*

Bilirubin is the breakdown product of haemoglobin, the molecule in Red Blood Cells responsible for carrying oxygen around the body, Bilirubin is chemically modified in the liver before being excreted as bile. Elevated levels of Bilirubin can be as a result of blocked bile ducts, several types of anaemia, a number of genetic disorders and liver disease. Bilirubin is a coloured molecule and when it gets above certain levels it can be detected visually through the discolouration / yellowing of the whites of the eyes and the skin (jaundice).

If you think you need a LFT, are worried about your LFT results or would like some more information please contact us on **0845 7626316** and press one or contact your GP.