

# LIVER FUNCTION

## TESTS

### Albumin (plasma or serum)

32-45 g/L. Varies with age.

Assessment of hydration, nutritional status, protein-losing disorders and liver disease.

### ALP (alkaline Phosphatase)

Neonate: 50-300 U/L

Growing child: 70-350 U/L

Adult, non-pregnant: 25-100 U/L

Higher levels are seen in the third trimester of pregnancy and in individuals over 50 years of age.

Investigation of hepatobiliary or bone disease.

### AST

<40 U/L. (<80 U/L in neonates).

Detection and monitoring of liver cell damage.

### Bilirubin

Bilirubin (total): <20  $\mu\text{mol/L}$

Bilirubin (direct): <7  $\mu\text{mol/L}$

Investigation and monitoring of hepatobiliary disease and haemolysis.

In most circumstances total bilirubin is sufficient.

### GGT

Male: <50 U/L

Female: <30 U/L

Assessment of liver disease.

Increased levels are found in cholestatic liver disease and in hepatocellular disease when there is an element of cholestasis.

Levels are increased in diabetes, with chronic intake of excess alcohol and with certain drugs (especially phenytoin) as a result of enzyme induction.

Pancreatitis and prostatitis may also be associated with increased levels.

Levels may be normal early in the course of acute hepatocellular damage eg, acute viral hepatitis, paracetamol hepatotoxicity.



## **Globulins**

Calculated: globulin = total protein - albumin.

Neonate: 12-36 g/L

Adult: 25-35 g/L

Identification of hypo- and hyper-gammaglobulinaemia.

Paraproteinaemias are not reliably detected by calculation of total globulin.

Specific measurement of immunoglobulins and protein electrophoresis is preferred.

Reference values may differ between racial groups.

Levels are increased with chronic inflammation, infection, autoimmune disease, liver disease, and paraproteinaemia.

Levels are decreased in protein-losing enteropathy, humoral immunodeficiency and sometimes in the nephrotic syndrome.

## **LD**

110-230 U/L (method and age dependent).

It is occasionally useful in the assessment of patients with liver disease or malignancy (especially lymphoma, seminoma, hepatic metastases); anaemia when haemolysis or ineffective erythropoiesis suspected.

Although it may be elevated in patients with skeletal muscle damage it is not a useful in this situation.

## **ALT**

Adult: <35 U/L

Neonate: <50 U/L

Detection and monitoring of liver cell damage.

Increased ALT levels are associated with hepatocellular damage.

ALT is more specific for hepatocellular damage than is AST or LD and remains elevated for longer, due to its longer half-life.

The AST/ALT ratio is typically >1 in alcoholic liver disease and <1 in non-alcoholic liver disease.

## **PT**

Reagent dependent; prothrombin time generally 11-15 seconds.

More sensitive than the APTT for the detection of coagulation factor deficiencies due to vitamin K deficiency, liver disease.

Screen for deficiency of factor VII and, with APTT, factors X, V, II, I.

An abnormal result is most often due to liver disease, vitamin K deficiency or oral anticoagulant therapy.