

HAEMATOLOGY AND BIOCHEMISTRY PROFILES – Patient Information Sheet

This information sheet briefly explains the blood tests within a typical screening profile. This is not intended to **interpret** pathology results, but to explain more about the individual tests incorporated in the screen. If results fall outside normal values/reference ranges, clinicians will identify whether they are significant or not, in line with history, medication and clinical presentation.

These tests can provide the first clues as to whether there is any evidence of physical illness or disease. Almost all numeric data within the haematology section is known as a 'Full Blood Count'. Variations in the number, type and form of red cells, white cells and platelets give insight in the condition of blood and clinical factors which may affect it.

Routine biochemical tests will show you how well the liver, kidneys and thyroid gland are working, as well as making certain that blood sugar, fats, serum, electrolytes are within normal limits.

HAEMATOLOGY

- **Haemoglobin:** gives the red cells their colour and carries oxygen from the lungs to the cells. This test is primarily used to determine the presence of anaemia, or it's reverse, polycythaemia.
- **Red Cell Count:** measure the number of red cells in the blood. A low count often accompanies anaemia, excess body fluid and blood loss. A high count is commonly seen in dehydration and in a rare condition called polycythaemia.
- **Haematocrit:** measures the percentage of red blood cells in a standard volume of blood. It is used, in conjunction with the haemoglobin and red cell count, to determine the presence and type of anaemia.
- **Red Cell Indies (MCV, MCH, MCHC, RDW):** provides detailed information on the volume and haemoglobin content of red blood cells and are used to determine types of anaemia:
 - **MCV** Mean Cell Volume measures the average volume of red cells
 - **MCH** Mean Cell Haemoglobin measures the weight of haemoglobin in the average red cell
 - **MCHC** Mean Cell Haemoglobin Concentration measures the weight of haemoglobin in a standard volume of blood
 - **RDW** Red Cell Distribution Width measures the degree of size variation in red cells
- **Platelet Count:** measures the number of platelets in blood. High platelet counts are often seen following strenuous activity, in infections and inflammation. Extremely low platelet counts can be associated spontaneous bleeding.

- **White Blood Count:** measures the number of white blood cells on blood. High counts are seen in infection, after exercise, stress and disease. Low counts may be seen in viral infections
- **Neutrophils, Lymphocytes, Monocytes, Eosinophils, Basophils:** are the different types of white blood cell in the sample. Usually called a 'differential', in conjunction with the total white cell count, these numbers assist assessment of the blood profile.
- **ESR:** Erythrocyte Sedimentation Rate is a non-specific blood test which when raised, can demonstrate the presence of inflammatory, infective, or malignant disorders. Although the test is non-specific, it remains a useful marker of organic disease.

BIOCHEMISTRY

- **Sodium, Potassium, Chloride, Bicarbonate:** these are known as 'electrolytes' and are involved in the maintenance of the salt and water balance in the body. They may be affected by dehydration and some of the commonly used drugs e.g. diuretics.
- **Urea and Creatinine:** used to assess kidney function.
- **Bilirubin:** is a pigment in bile and an excess will make a person with jaundice look yellow. Mild increases are very common and are of no significance, however, a grossly elevated bilirubin may indicate concerns with the liver.
- **Alkaline Phosphatase:** is an enzyme which mainly comes from the liver and bone but it also present in the small intestine, placenta and kidney,
- **Aspartate Transferase Alanine Transferase, LDH (Lactate Dehydrogenase):** these enzymes are present in very high amounts in the liver, AST and LDH are also present in all body muscle, heart muscle and red cells. Whilst high levels can assist with diagnosis, no clinical significance can be attribute to low levels.
- **CK:** Creatine PhosphoKinase is an enzyme found in concentrations in the heart and body muscle. High values are often seen following strenuous activity. The values observed can also depend upon racial origin.
- **Gamma GT:** Gamma Glutamyl Transferase is an enzyme found abundantly in the liver, kidneys and pancreas. It is widely used to assess liver function. Some drugs, and also alcohol, induce the liver to produce more of this enzyme,
- **Total Protein:** measures several different proteins, with mainly albumin and globulin being the most abundant types in the plasma. Changes in total protein concentration are common.
- **Albumin:** low albumin levels can be seen in conditions resulting in protein loss, reduction in synthesis, abnormal distribution of albumin. High levels are often the result of dehydration, or even prolonged application of a tourniquet at the time of sample taking.
- **Globulin:** another constituent of serum proteins. Increased levels can be seen in a number of conditions e.g. inflammation and infection.

- **Calcium and Phosphate:** levels may be increased or decreased in a variety of bone disease and are also useful in assessing kidney function. The calcium concentration is affected by the albumin level.
- **Uric Acid:** increased levels are seen in many disorders and most commonly in those with a predisposition to gout, while decreased levels are probably of little clinical significance.
- **Glucose:** useful in the diagnosis of diabetes mellitus but levels vary widely depending on whether the sample was taken after fasting or after a meal. Increased and decreased levels can be seen in a number of other clinical conditions.
- **Triglycerides, Cholesterol, HDL Cholesterol, LDL Cholesterol:** this is usually known as the 'lipid profile' and helps assess risk for atherosclerosis (the thickening of artery walls) and subsequent risk of heart disease. Fasting for up to 12 hours may be recommended.
- **Iron:** an essential element, which takes part in many life processes. As a result, iron levels are seen to widely fluctuate. Deficiency is a common cause of anaemia, although low and high values are seen in many conditions