

# Medicine for Managers

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## Can I have a Blood Test, Doc?

**Every doctor will tell you that it is sometimes not possible to put a definitive diagnosis to a set of symptoms. They may be vague or minor or simply the result of a viral infection. But these days a diagnosis based on clinical experience or expertise is not accepted by many and the doctor hears the magic words "Can't I have a blood test doctor?"**

There are many hundreds of different blood tests in the armoury of the healthcare professional. They can be used to assess the function of various body organs (such as the kidney or liver), identify the presence of infection, spot changes associated with allergy, give clues to the presence of specific diseases and assist in making an assessment of general health.

However they do not provide the answer to many bodily mysteries and, because someone has symptoms, it does not mean that some sort of blood test will reveal the diagnosis. Furthermore, blood tests are often a guide rather than a definitive answer and a result may need translation in the context of other findings.

There are therefore occasions when a test appears abnormal on the face of it but, when viewed as part of the holistic

assessment of the patient, it may be inappropriate to provide some sort of treatment or indeed to act on it at all.

Blood tests are usually easy to do. They normally involve introducing a needle through the skin and taking blood from a vein in the arm. Sometimes the veins may be difficult to find and it may be necessary to use another site, such as the back of the hand or the wrist. These days the collection bottles are test specific and fit on the end of the needle obviating the need for syringes.

So, the key question is; what does it mean when you see a blood form that is ordering an FBC, ESR, CRP, E&U, e-GFR, LFTs, TFTs, lipids and cholesterol, blood sugar and amylase. Let's take them in order:

**FBC (full blood count);** a FBC is an examination of all the different types of cell

in circulating blood, their numbers and shape. So, for example, it gives a measure of the iron containing haemoglobin in red blood cells and therefore whether a patient is anaemic.

Variations in white blood cells may suggest infection (bacterial or viral) as well as point to more serious diseases such as leukemia. Changes in blood platelets may suggest bone marrow disease or, if low, a clotting disorder.

**ESR (Erythrocyte Sedimentation Rate);** this is a very old test and is no more technical than standing a column of blood in a tube and seeing how quickly the red blood cells sink in the liquid. It is measured after one hour. If there is inflammation in the body, the red blood cells clump together and sink more quickly.

Thus the test may show up inflammatory diseases of the joints, gut or heart as well as auto-immune diseases such as temporal arteritis and polymyalgia rheumatica.

**CRP (C-Reactive Protein);** is an acute protein elevated in infection, particularly bacterial infection and also in situations of inflammation. It may be increased by a factor of several hundred in acute infections.

**E&U (Electrolytes and Urea);** Kidney function can be measured by their ability to remove creatinine and urea from the body. Increased concentrations above normal may suggest that the kidneys are failing but can be caused by such things as dehydration.

The elements sodium and potassium are the most commonly measured electrolytes and may give an indication of problems ranging from dehydration, diarrhoea and uncontrolled diabetes to kidney failure or complications of some sorts of medication.

The **e-GFR (estimated Glomerular Filtration Rate)** is an estimate of kidney function and is calculated from the serum creatinine. It provides a useful tool for monitoring kidney function over a period of time.

**LFTs (Liver Function Tests);** not surprisingly measure the function of the liver. A raised bilirubin is the biochemical confirmation of jaundice. A raised alkaline phosphatase is a measure of liver and bone disease and may warn of a variety of illnesses which require investigation.

Other liver tests may suggest a variety of diseases from heart failure to malignancy. Gamma-glutamyl transferase (GGT) is a sensitive measure for excessive alcohol intake.

**TFTs (Thyroid Function Tests);** The thyroid gland controls the rate at which the body functions, underactivity being associated with slowness, lethargy and sluggish function, whereas overactivity is associated with insomnia, weight loss, agitation and speeded body functions.

Thyroid function tests measure the release of the controlling chemical from the pituitary gland, thyroid stimulating hormone, which is raised when thyroid activity is low, and reduced when the thyroid is overactive.

**Lipids and Cholesterol;** normally done on a fasting specimen of blood, the test measures the level of cholesterol as well as triglycerides (which are smaller molecules also associated with heart disease) and low density lipoprotein (LDL) also known as 'bad' cholesterol and high density lipoprotein (HDL), often known as 'good' cholesterol. The LDL increases the risk of heart disease and the HDL mops up LDL and is thought to have a vascular repair function.

**Blood sugar** is used to identify diabetic patients or those with pre-diabetic rises in blood glucose. For those patients with established diabetes, control is normally more accurately measured using the **HbA1C (part of the haemoglobin molecule to**

**which sugar is attached)** which gives a six-week picture of sugar control.

In addition blood testing can be used for a large number of specific investigations. It may be necessary to identify an individual's blood group for transfusion purposes, to test for infections by taking blood samples and adding them to culture media to encourage the growth of circulating bacteria and to identify genetic abnormalities associated with a variety of diseases.

Blood test results must be used with caution because they can sometimes be misleading. For example, Prostate Specific Antigen is manufactured by the prostate and the blood level of the glycoprotein depends on age but also on the condition of the prostate.

It may be markedly raised in cases of prostatitis or prostate cancer but can also be high after sexual activity, cycling and a urinary infection. For that reason it may not be a reliable screening test for prostate disease.

So blood tests are remarkably valuable in reaching a host of diagnoses but they must be viewed with care because an abnormal result is not synonymous with disease and a normal result does not necessarily exclude illness.

For that reason blood tests are used as an aid to investigation and monitoring but form only part of the increasing arsenal of investigations available to the physician.

It should be remembered that they assist and confirm or refute suspicions but they do not replace the tried and tested medical techniques of history and examination by a skilled clinician – not yet, anyway!!!

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