Clinical tests: Spectrophotometry, Nephelometry, Turbidimetry, Haematology

Spectrophotometry

This is a method used to measure how much a chemical substance can absorb or transmit light.

- A UV-visible spectrophotometer uses light over the UV and visible range of the electromagnetic spectrum.
- An IR spectrophotometer uses light over the IR range of the electromagnetic spectrum.

In clinical applications, spectrophotometry can be used to examine blood or spinal fluid for clinical diagnosis.

Haematology

This involves the diagnosis and treatment of patients who have disorders of the blood and bone marrow. Disorders include haemophilia, thalassaemia, leukaemia, lymphoma, and sickle cell anaemia.

Haematology Test	Uses
Full blood count	Aids in diagnosing anaemia, certain cancers of the blood, inflammatory disease and to monitor blood loss and infection.
Platelet count (usually done as part of the full blood count)	To diagnose and/or to monitor certain types of bleeding and blood clotting disorders.
Prothrombin time (PT), Partial thromboplastin time (PTT) and International normalised ratio (INR)	To evaluate bleeding and clotting disorders and to monitor anticoagulation (anticlotting) therapies.

A full blood count involves:

- counting the number of red blood cells, white blood cells, and platelets per millilitre of blood
- calculating the mean size of red blood cells
- calculating the proportion of blood made up from red blood cells (haematocrit)
- the amount of haemoglobin in red blood cells
- differential counts of the number and type of white blood cells (eosinophils, basophils, lymphocytes, monocytes).

Nephelometry and Turbidimetry

Nephelometry measures the amount of light scattered as it hits particles suspended in a solution. Turbidimetry measures the amount of light transmitted as it hits particles in a solution.

Nephelometry is used to measure the concentration of antibodies. such as immunoglobulins, in blood. It is used to diagnose different types of cancer, arthritis, and liver disease.

Turbidimetry can be used to determine the concentration of proteins in biological fluids, such as urine and blood, or to estimate the number of cells present in a solution.