Clinical laboratory tests used in the evaluation of disease states -significance and interpretation of test results

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- **Hematological, Liver function, Renal function, thyroid function tests**
- **Tests associated with cardiac disorders**
- **Fluid and electrolyte balance**
- **Pulmonary Function Tests**

Haematological:

 Hematology (hema- is from the Greek word for 'blood') is the study of blood in regards to a person's health or disease. It includes blood, blood-forming organs, and the proteins involved in bleeding and clotting.

Significance and interpretation of Haematological test:

 Hematological tests can evaluate numerous conditions involving blood and its components.

 They can also be used to diagnose inflammation, anemia, infection, hemophilia, blood-clotting disorders, leukemia, and response to chemotherapy, among many other things. Let's take a look at some of these tests.

A hematology test is a blood test. Any test that requires blood or blood parts is a hematology test. These tests can offer information to a doctor about what is happening in the blood. The most common hematology tests include:

 Complete blood count (CBC) - This test counts the number of white blood cells, red blood cells, platelets, and more. This test helps to diagnose anemia, some blood cancers, inflammatory diseases, infections, and other health concerns.

 A complete blood count (CBC) measures several components and features of your blood. A CBC and its individual components are tested on whole blood. It can include measurements of the following:

 Platelet count - This test is included in a CBC, but can also be done on its own in order to monitor clotting or bleeding disorders.

 Prothrombin time or Partial Thromboplastin Time - These tests evaluate some blood disorders and monitor ongoing therapies.

 International Normalized Ratio - This test monitors anticoagulation as well as blood disorders, including anemia

 Hematology tests help to diagnose blood cancers, anemia, and disorders related to clotting, bleeding, and coagulation.

Liver Function Test:

 Liver function tests (also known as a liver panel) are blood tests that measure different enzymes, proteins, and other substances made by the liver.

 LFTs include liver enzymes, albumin and other proteins, and bilirubin. The liver enzymes are produced by cells within the liver.

 They include alkaline phosphatase (ALP), ɣ–glutamyl transpeptidase (GGT), alanine aminotransferase (ALT) and aspartate aminotransferase (AST), but the combination of liver enzyme results you receive depends on your local laboratory.

 The protein components comprise total protein, albumin and globulin [N.B. Total protein = Albumin + Globulins].

 The globulins are a mixture of globular proteins such as immunoglobulins, enzymes, carrier proteins and complement. The LFT’s reflect a limited range of hepatic metabolic processes.

 Bilirubin is an indication of the detoxification/excretory function and albumin reflects the synthetic function.

Liver function tests are most often used to:

- Help diagnose liver diseases, such as hepatitis
- Monitor treatment of liver disease. These tests can show how well the treatment is working.
- Check how badly a liver has been damaged or scarred by disease, such as cirrhosis
- Monitor side effects of certain medicines

Jaundice, a condition that causes your skin and eyes to turn yellow

- Nausea and vomiting
- Diarrhea
- Abdominal pain
- Dark-colored urine
- Light-colored stool
- Fatigue

Renal Function Test:

- Renal function tests (RFT) are a group of tests that may be performed together to evaluate kidney (renal) function.
- The tests measure levels of various substances, including several minerals, electrolytes, proteins, and glucose (sugar), in the blood to determine the current health of the kidneys.
- If the kidneys are not functioning properly, waste products can accumulate in the blood and fluid levels can increase to dangerous volumes, causing damage to the body or a potentially life-threatening situation. Numerous conditions and diseases can result in damage to the kidneys.
- The most common causes of and main risk factors for kidney disease are diabetes and hypertension.

The most practical tests to assess renal function is to get an estimate of the glomerular filtration rate (GFR) and to check for proteinuria (albuminuria).

According to the Kidney Disease Improving Global Outcomes (KDIGO), The stages of chronic kidney disease (CKD):

- Stage 1 GFR greater than 90 ml/min/1.73 m^2
- Stage 2 GFR-between 60 to 89 ml/min/1.73 m^2
- Stage 3a GFR 45 to 59 ml/min/1.73 m^2
- Stage 3b GFR 30 to 44 ml/min/1.73 m^2
- Stage 4 GFR of 15 to 29 ml/min/1.73 m^2
- Stage 5-GFR less than 15 ml/min/1.73 m^2 (end-stage renal disease)

Thyroid Function Test:

- Thyroid function tests are blood tests which help to check the function of your thyroid gland.
- They are mainly used to detect an underactive thyroid gland (hypothyroidism) and an overactive thyroid gland (hyperthyroidism).
- The two hormones, thyroxine (T4) and thyroid-stimulating hormone (TSH), work together and are usually in balance