**Lecture 6 (2021)**

**Common bloodtests**

Blood tests are performed to determine the biochemical and physiological state of the blood, which can determine if a patient is ill, if there is an imbalance in a mineral, if drugs are working or present, or if organs are functioning properly.

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**1-Complete Blood Count (CBC)**

2-**Chemistry Panel :measures**

**A- Blood glucose**

Blood glucose tests are also sometimes called blood sugar done as:

* **Fasting blood suger test:**

[**\*Oral glucose tolerance test**](https://www.healthdirect.gov.au/diabetes-diagnosis)

Abbreviated as **OGTT or GTT**, for this test patient fast, then have a blood sample taken, then drink glucose, and then have a number of samples taken over a few hours. They are usually used to check for or monitor diabetes.

The standard blood glucose tests measure blood sugar level at a particular time. The OGTT measures respond to glucose.

Pregnant women can develop a particular type of diabetes called [gestational diabetes](http://www.pregnancybirthbaby.org.au/gestational-diabetes), and might be asked to have an OGTT around 28 weeks of pregnancy. Gestational diabetes usually goes away after the baby is born.

**\*HbA1c test**

HbA1c is a blood test that is used to help diagnose and monitor people with diabetes. It is also sometimes called a haemoglobin A1c, glycated haemoglobin or glycosylated haemoglobin.HbA1c refers to glucose and haemoglobin joined together (the haemoglobin is ’glycated’). Haemoglobin is the protein in [red blood cells](https://www.healthdirect.gov.au/red-blood-cells) that carries oxygen throughout the body. The amount of HbA1c formed is directly related to the amount of glucose in blood.

Red blood cells live for up to 4 months, so HbA1c gives an indication of how much sugar in blood over the past few months. It’s different to the [blood glucose test](https://www.healthdirect.gov.au/blood-glucose-test), which measures how much sugar in blood at that moment.



It can used to [diagnose diabetes](https://www.healthdirect.gov.au/diabetes-diagnosis) and indicates how well diabetes has been controlled over the last few months. Higher of HbA1c, mean greater risk of developing complications such as problems with [eyes](https://www.healthdirect.gov.au/eyes) and [kidneys](https://www.healthdirect.gov.au/kidneys).

**B- Kidney function tests**

Kidney tests are very important for people who have [diabetes](https://www.healthdirect.gov.au/diabetes), [high blood pressure](https://www.healthdirect.gov.au/high-blood-pressure-hypertension) or [heart disease](https://www.healthdirect.gov.au/coronary-heart-disease-and-atherosclerosis).

**The most important tests:**

[Creatinine](http://www.labtestsonline.org.au/learning/test-index/creatinine#tab-index=0) and urea in blood & [Electrolytes](http://www.labtestsonline.org.au/learning/test-index/electrolytes) in blood – usually sodium, potassium, chloride or bicarbonate.

* **Liver function tests**

Liver function tests (also called LFTs) are blood tests that can provide information about liver working. They test the levels of a number of proteins and enzymes that are either produced by liver cells or released into the blood when liver cells are damaged

* **Cardiac enzymes**

Cardiac enzyme tests can check whether the heart muscle is damaged, and indicate if a person has had a heart attack.The most common test is troponin. This test has replaced other cardiac enzyme tests previously done (total cholesterol, HDL (high-density lipoprotein), LDL (low-density lipo-protein), triglycerides, and the total cholesterol/HDL ratio, as it is more accurate.

# Troponin is a protein found in the heart muscle. When the heart muscle is injured, troponin is released into the bloodstream and the level that can be detected goes up. This can happen during and after a heart attack. Often the test will be done more than once to monitor for damage.

### Common Blood Test Codes

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| --- | --- |
| **Blood Test Code** | **Definition** |
| **CBC: Complete Blood Count** | This is one of the most common tests administered, which measures the cell count in the blood and the ratios and weights of blood components by comparing white and red blood cell counts, hemoglobin, hematocrit, and corpuscular volume.. It helps doctors determine if a patient is affected by infection, anemia, blood cancers, immunity issues, or platelet problems. |
| **BMP: Basic Metabolic Panel** | This series of tests is used to measure chemicals present in the blood. The test is administered on the plasma and measures electrolyte levels, glucose, calcium, and other chemicals. It is used to determine a patient’s overall health and if there are any underlying imbalances causes various health problems. |
| **CK: Creatine Kinase Tests** | This measures an enzyme in your body that is produced when the heart is injured. This test is used when a patient has a heart attack. It indicates the severity of the heart attack. |
| **LDL and HDL** | This tests measures the amount of bad (LDL) and good (HDL) cholesterol in the blood. If results are out of the norm, your doctor will likely suggest dietary changes and potentially cholesterol medication. |
| **CRP: C-Reactive Protein Test** | This test measures how much protein in the blood which indicates if a patient has inflammation and is at risk for a heart attack. Result can be used to encourage a patient to make lifestyle changes to reduce his or her risk. |
| **TSH: Thyroid Stimulating Hormone Test** | This test is used to diagnose thyroid disorders, such as when the thyroid is underactive or there is a problem with fertility. |
| **AST: Asparate Aminotransferase** | This measures an enzyme found in the blood that rises when an injury occurs in the body’s tissue or an organ. It helps a doctor determine if there are internal injuries. |

### Other Blood Test Codes

The following are codes for less common blood tests:

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| **Codes** | **Common Names** | **Test For** |
| **25 Hydroxy Vitamin D** | Vitamin D | Levels of Vitamin D |
| **ALT** | Alanine Transaminase | Liver Function |
| **ANA** | Antinuclear antibody | Autoimmune disease |
| **BAC** | Blood Alcohol Concentration | Blood alcohol |
| **BNP** | Beta natriuretic peptide | Congestive heart failure |
| **BUN** | Blood Urea Nitrogen | Kidney Function |
| **Ca** | Calcium | Levels of Blood Calcium |
| **CBL** | Cobalamin (Vitamin B12) | Levels of Vitamin B12 |
| **CMP** | Comprehensive Metabolic Panel | Refer to a group of tests |
| **CPK** | Creatine phosphokinase | Muscle Damage |
| **Cr** | Creatinine | Kidney Function |
| **ESR** | Erythrocyte Sedimentation Rate | 'sed rate'. Test for inflammation |
| **Hct** | Hematocrit | Part of the CBC Blood Test |
| **Hgb** | Hemoglobin | Part of the CBC Blood Test |
| **INR** | International Normalized Ratio | A test of blood clotting |
| **K** | Potassium | Measures potassium level in blood |
| **MCV** | Mean Corpuscle Volume | One of the CBC |
| **Mg** | Magnesium | Measures magnesium level in blood |
| **Na** | Sodium | Measures sodium level of the blood |
| **Platelets** | Platelets | One of the CBC |
| **PSA** | Prostate Specific Antigen | Prostate Cancer |
| **PT** | Prothrombin Time | Blood clotting |
| **PTT** | Partial Thromboplastin Time | Blood clotting |
| **RBC** | Red Blood Cell Count | One of the CBC |
| **TPO** | Thyroid Peroxidase Antibodies | Measurement of antibodies to the thyroid |
| **Trig** | Triglygerides | Cholesterol |
| **WBC** | White Blood Cell Count | One of the CBC |

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### Blood Test Reference Range

**1. Complete Blood Count**

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| --- | --- |
| **Test Items** | **Normal Results** |
| Red blood cell | 5 to 6 million cells/mcL (male) |
| 4 to 5 million cells/mcL (female) |
| White blood cell | 4,500 to 10,000 cells/mcL |
| Platelets | 140,000 to 450,000 cells/mcL |
| Hemoglobin | 14 to 17 gm/dL (male) |
| 12 to 15 gm/dL (female) |
| Hematocrit | 41% to 50% (male) |
| 36% to 44% (female) |
| Mean corpuscular volume | 80 to 95 femtoliter |

**2. Blood Glucose**

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| **Plasma Glucose (mg/dL)** | **Results** |
| <99 | Normal |
| 100 - 125 | Prediabetes |
| >126 | Diabetes |

**3. Lipoprotein Panel**

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| **Total Cholesterol (mg/dL)** | **Diagnosis** |
| <200 | Optimal |
| 200–239 | Borderline High |
| >240 | High |

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| **LDL Cholesterol (mg/dL)** | **Diagnosis** |
| <100 | Desirable |
| 100–129 | Near Desirable |
| 130–159 | Borderline High |
| 160–189 | High |
| >190 | Very High |

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| --- | --- |
| **HDL Cholesterol (mg/dL)** | **Diagnosis** |
| <40 | Risk of heart disease |
| 40–59 | Better to be higher |
| >60 | Protect against heart disease |
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