

What Does My Blood Test Mean

CBC with Differential

This means that your doctor wants to know the amounts and proportions among the various components of your blood, explained below. The term differential refers to the fact that each person has several different kinds of white cells and each type performs a different function in our bodies. The differential measures each different kind of white cell and calculates the proportion of each as a percentage of all the cells in your blood.

White blood cell count: White blood cells are also called *leucocytes* (luke-o-sites). The white blood cell count is simply the number of white blood cells in your blood.

Red blood cell count (also called erythrocyte count): Red blood cells are also called erythrocytes (ee-ree-throw-sites). The red blood cell count is simply the number of red blood cells in your blood. It is also often reported in millions. The life of a red cell in your body is usually about 120 days (4 months).

Hemoglobin: Hemoglobin is the primary component of your red blood cells. The hemoglobin carries oxygen and carbon dioxide around your bodies. It has one part called *heme* which contains iron and the characteristic red pigment of your blood called porphyrin (pore-fer-in). The other part is a protein called *globin* formed from a number of amino acids. The oxygen easily combines with the heme so it can get around to your body's cells. Because the oxygen actually attaches to your hemoglobin, it is important for your doctor to know how much hemoglobin you have.

Hematocrit: Hematocrit is a measure of the "mass" of your red blood cells. In this test, the blood cells and plasma are separated (that's what the word hematocrit means) and the proportion of reds in your whole blood is reported as a percentage. This value is calculated and, as such, is slightly less accurate than a hemoglobin count which is measured directly.

RDW Red cell distribution width: Normal red cells are approximately round and have some variation in their width. But, abnormal variation in size, called *anisocytosis*, together with MCV, helps your doctor determine what kind of anemia you may have.

Platelet count: This is a simple count of the number of platelets in your blood. Platelets are critical to clotting and preventing bleeding.

Mean platelet volume: This measures the size of your platelets.

Differential: Each of the various kinds of white blood cells performs several different functions.

They include:

- Neutrophils: Combat infections, among other functions
- Eosinophils: Work on allergic disorders and parasitic infestations among other functions
- Basophils: Work on parasitic infections among other functions
- Lymphocytes: Combat bacterial infections, such as strep, and viral infections, such as measles and chickenpox, among other functions
- Monocytes: Work on severe infections, among other functions

Blood Chemistry Tests

CO₂: Determining your CO₂ level gives your oncologist an idea about whether your blood is acidic or alkaline. As with several of the tests in this list, this gives your doctor an idea about whether your treatment might be affecting your kidneys. Severe vomiting and severe diarrhea can also affect your CO₂ levels. The amount of nearly all these will decline whenever you become dehydrated, such as through sweating, vomiting, and diarrhea.

Calcium: Most of your calcium is stored in your bones and teeth. But, for your muscles to flex, and for your heart to beat your body needs what is called *ionized calcium*, that is, calcium in a specific form which is NOT part of your bones and teeth. If the level in your blood is abnormally low, your body will draw calcium from your bones and teeth, which can result in other problems.

Chloride: This helps your cells operate properly. In between your cells is an area called the extracellular spaces. Chloride in the extracellular spaces helps osmosis work properly.

Phosphorus: Phosphorus is required together with calcium for your bones. However, some of it is found in other parts of your body as well. It is required so that new bone can be formed. It is also required to metabolize both glucose (the simple sugar found in your blood) as well as lipids (fats). As part of its role in metabolism, it also helps move energy around your body. There must be a balance between calcium and phosphorus in your body. When one increases, the other is decreased by excreting it through your kidneys. So, if you have excess calcium, you may have abnormally low

phosphorus and vice versa.

Potassium: Potassium is the principal electrolyte in intracellular fluid, that is, fluid inside your cells. Even if you don't eat any potassium-containing foods (bananas and dark, green leafy veggies for example), your body still excretes potassium. It's quite likely that, if you're unable to eat for a period of time, your body will have a low potassium level and you might require a pill or other medication. Potassium is very important for conducting nerve impulses, for muscle functioning (again, especially the heart), and in the osmosis process mentioned in the discussion of chlorine. A low potassium level can be determined also by looking at an electrocardiogram which will show a U-wave in the absence of the proper amount of potassium. Too high a level of potassium can be fatal.

Sodium: Sodium is the principal electrolyte in our blood. The other electrolytes are there but not as prominent. Like potassium and chlorine, it is important in cell osmosis. It is also important in the transmission of nerve impulses. A number of compounds work at keeping the level of sodium in our bodies at an appropriate level and, even if we become dehydrated for some reason, it is quite difficult to reduce the amount of sodium circulating in our blood without fundamental, underlying health problems.

Glucose and Related Tests

Glucose: Glucose is a simple sugar. For anything you eat to be used by your body for energy, it needs to be converted to glucose. Not only are "big" sugars such as sucrose (found in granular sugar) or fructose (found in soft drinks and other "sugary" treats) converted to a simpler form, but lipids (fats) and complex carbohydrates (such as grains) are also converted to glucose. The big sugars convert to glucose most quickly and lipids convert most slowly to glucose. Complex carbohydrates convert to glucose at an intermediate rate. Elevated glucose levels, as in diabetes, can interfere with proper metabolism of your chemotherapy drugs and can otherwise interfere in your life.

Glycosylated hemoglobin Hgb A1C: Glycosylated hemoglobin is a measure of your long-term control of blood glucose levels. This test is primarily used for monitoring diabetics. As reds circulate, they combine some of the glucose in your blood with hemoglobin to form a special form of hemoglobin called glycohemoglobin. The amount of this as a percentage of your total hemoglobin is reported in your test results.

Metabolic Products

Metabolic products are "waste products" of your cells. They need to be removed from your body. Your blood is one way that these are removed from your cells and the areas around them and moved to your body's garbage dumps for processing.

Bilirubin, total: Bilirubin (billy-ru-bin) is a result of the breakdown of red blood cells which are then handled by your liver. If your reds are undergoing their normal process and your liver is fine, your bilirubin level will be within the normal limits. But, if your reds are damaged somehow or if your liver is inflamed, obstructed, or otherwise damaged, the amount of bilirubin is likely to go up because your blood will be hauling the damaged reds off to the liver for processing.

Blood urea nitrogen: This is sometimes also reported simply as urea nitrogen or as BUN. It describes how your kidneys are functioning.

Creatinine: Creatinine is a measure of how your body metabolizes energy. It is produced at a steady rate and depends on the amount of muscle in your body. Larger people will produce more than smaller people. If the amount of muscle in your body changes, the amount of creatinine will change. Creatinine is normally excreted through your kidneys, so this also gives an indication of how well your kidneys are functioning.

Protein Tests

The two major protein tests, albumin and total protein are reported in grams per deciliter. Proteins are responsible for many functions in our bodies, including transporting certain molecules to the parts of our bodies where they're needed, regulating certain enzymes that govern our bodies' functions, and as immunologic agents.

Albumin: The levels of albumin are another clue to your level of nutrition. For example, when you have IVs, become dehydrated, or have decreases in your liver or kidney functions, the amount of albumin circulating in your blood will change.

Total protein: The total amount of protein in your blood will change when you become dehydrated or when your blood becomes *hemoconcentrated* due to fluid loss for some reason. This is also an indicator of a number of different problems with various organs of your body. So, this test is used together with other tests to monitor your progress.

Enzyme Tests

Alkaline phosphatase: Alkaline phosphatase is found primarily in the bone and liver and somewhat in the kidney and colon.

ALT (SGPT): This stands for *alanine transaminase*, which is an enzyme present in the liver, with lesser concentrations in the heart, muscle, and kidneys. It is used primarily to diagnose liver dysfunction of various kinds.

AST (SGOT): This stands for *aspartate transaminase* which is an enzyme present in areas of your body that are metabolizing glucose rapidly. When cells are injured or die, AST is released into the blood stream. Aspartate transaminase is present in your liver, muscles, and lungs, among other organs.

LD: LD is short for lactic acid dehydrogenase. It is an enzyme within your cells that is present especially in the kidneys, liver, brain, lung, heart, reds, and skeletal muscles. It is useful in monitoring the status of the organs in which it is particularly present.

Lipoprotein Tests

Cholesterol: This test is the most commonly used indicator of your risk for atherosclerosis and related heart disease. You're likely to have this test on a regular basis, if you had a high value at initial testing. if you're trying to lower your cholesterol by diet, or if you're on a cholesterol-lowering medication.

Triglycerides: This test measures your body's ability to metabolize fats. Like cholesterol, is a measure of risk for atherosclerosis and related heart disease; but, because triglyceride levels are independent of cholesterol level, doctors often want to know both values to make a better evaluation of risk. Because this test is very sensitive to diet, it is always measured on a fasting basis, i.e., you cannot have had anything to eat or drink (except water) for twelve hours before your blood is drawn for this test.

Lipoprotein: Often determined at the same time as a triglyceride test, this test measures the amounts of the various kinds of lipoproteins in your blood.

Two types are most frequently reported:

- **High-density lipoprotein** (also known as HDL or alpha) is popularly known as the "good" lipoprotein
- **Low-density lipoprotein** (also known as LDL or beta) is popularly known as the "bad" lipoprotein