

COMPLETE BLOOD COUNT (CBC) LAB RESULT EXPLANATION

These screenings are intended to provide information to be used by health care professionals to detect potential problems and help make you more aware of your health. If, after reading this pamphlet, you still have questions concerning your blood hematology results, please call your personal health care professional.

YOUR BLOOD TESTS

You and your doctor can learn a great deal about your health from a sample of your blood. Sometimes test results will be abnormal before you have any symptoms. If symptoms have developed, laboratory tests help confirm that a problem does exist. A normal test result is just as significant as an abnormal result. When a result is normal, it not only helps you rule out disease, but it also establishes a baseline for you. Each person has their own baseline "normal". A person's own results are the best baseline for monitoring any change that takes place in the future. If any of your values are significantly different than previous results, contact your health care professional.



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MEDICATIONS AND FASTING

Fasting is not required for accurate test results. Speak with your physician if you have concerns about medication interference with result values.

The CBC is used to present a general picture to overall health. It is also used to help diagnose diseases when people are not feeling well and to monitor treatment of many disease states such as anemia, leukemia, etc. In the CBC test, the different types of cells are counted and examined by a machine, or under the microscope. The seven components of a CBC are:

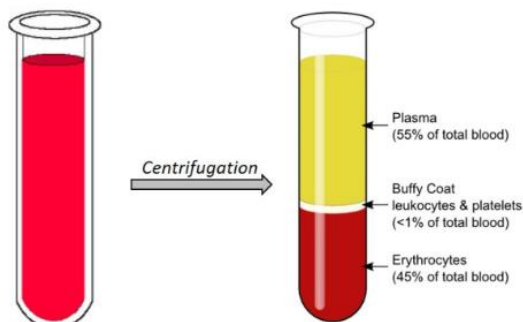
- Hemoglobin Concentration (HGB)
- Hematocrit Value (HCT)
- Red Blood Cell Count (RBC)
- Platelet Count (PLT)
- White Blood Cell Count (WBC)
- WBC Differential
- Indices

HEMATOCRIT (HCT) is the ratio of plasma (clear/yellow part of the blood) to red cells in the blood. In short, hematocrit measures how much of your blood is made of red cells. Hematocrit measurement is useful in identifying anemia, liver disease, and red cell production within the circulatory system. Hematocrit increases with altitude training or dehydration. Women generally have lower hematocrit values than men. A low hematocrit levels may be indicative of acute or long term bleeding, anemia, vitamin or mineral deficiency (essential vitamins and minerals are crucial in red blood cell production and overall health).

HEMOGLOBIN (HGB) is contained within red blood cells, and are the molecules that carry oxygen and carbon dioxide in the blood. Measuring hemoglobin gives an exact picture of the ability of your blood to carry oxygen. The oxygen is used by the cells to produce energy. The blood also brings carbon dioxide, the waste product of this energy process, back to your lungs where it is exhaled. People with low hemoglobin levels have anemia and usually have a low red blood cell count and a low hematocrit. Signs and symptoms of anemia include paleness, shortness of breath, and fatigue. These symptoms will start to show when the hemoglobin level is too low.

UNDERSTANDING DIFFERENT CELL TYPES

RED BLOOD CELLS (RBC) are the most common type of cell in the blood. Your body contains millions of these disc-shaped cells. Red blood cells (also called erythrocytes) are produced by the bone marrow continuously in healthy adults. The cells contain hemoglobin which carries oxygen and carbon dioxide throughout the body. The RBC count determines if the number of red blood cells in your body is low (anemia) or high (polycythemia). Common causes of an abnormal RBC count are iron deficiency anemia due to chronic blood loss (i.e. menstruation, small amounts of bleeding due to colon cancer), acute blood loss (due to bleeding ulcers, or trauma), and hereditary disorders (including sickle cell anemia). Polycythemia is relatively uncommon, but if indicated your provider may request therapeutic phlebotomy to decrease your RBC blood volume.



PLATELETS are the smallest type of cell found in the blood. Platelets (also called thrombocytes) help stop bleeding after an injury by gathering around the injury site, plugging the hole in the bleeding vessel and helping blood to clot more quickly. Platelet counts are often done if you are prone to bruising or if you are about to have surgery. The platelet count may change with bleeding disorders, heart disease, diabetes, inflammatory disorders, and anemias.

WHITE BLOOD CELLS (WBC) are your body's natural protectors. White blood cells (also called leukocytes) are larger than red blood cells, but there are fewer of them. When you have an infection, white blood cells are sent from the bone marrow to attack the bacteria or virus causing the infection. An increased number of white blood cells may occur with infections, appendicitis, pregnancy, leukemia, hemorrhage, and hemolysis. A low white blood cell count makes it harder for your body to fight off infection. People with a low WBC count are more likely to catch colds or other infectious diseases. Low RBC counts may be seen in infections like mumps, lupus, cirrhosis of the liver, and cancer. In addition, radiation therapy and certain types of drug therapy tend to lower the WBC count.

WBC DIFFERENTIAL There are five different types of white blood cells that make up the differential blood count. White blood cells come in several shapes and sizes and can be identified by the laboratory using an instrument known as a hematology analyzer or under a microscope.



NEUTROPHILS are the most populous of the circulating white blood cells, they are also the shortest lived in circulation. After production and release by the bone marrow, they only circulate for about eight hours before proceeding to the tissues where they live for about a week. A high neutrophil count is seen in infection, some cancers, arthritis, and sometimes when they body is under stress (post-surgery, trauma, etc.)



LYMPHOCYTES are diverse and complex in functionality throughout the body, and are important to your immune function. These cells are responsible for antibody production, direct cell-mediated destruction of virus-infected cells and tumor cells. Lymphocytes are further differentiated into B cells, T cells, and NK cells. After neutrophils, lymphocytes are the most numerous of the circulating white cells. A low lymphocyte count may be found in immune disorders.



MONOCYTES and neutrophils share the same stem cells, meaning they originate from the same cell line within the bone marrow. Circulating for five to eight days, they then enter the tissues where monocytes are transformed into histiocytes, which play an important role in immune function. A high monocyte count usually indicates an infection, often caused by bacteria.



EOSINOPHILS are specialized cells that support your immune function by consuming matter “flagged” by your immune system as harmful. Eosinophils are important in allergic reaction response, and fighting bacterial, viral, and parasitic infections. A high eosinophil count often indicates allergies, skin diseases, or parasitic infections.



BASOPHILS are the least numerous of the white blood cells. Basophils contain histamine and heparin, which are released during allergic reactions. Histamine enlarges your blood vessels to improve blood flow and heal the affected area, and heparin prevents blood from clotting too quickly. Basophils attack any organism that is unfamiliar to your body by surrounding and ingesting the foreign material.

INDICES are values which measure hemoglobin, hematocrit, and platelet components found in whole blood. These five indices include:

-MCV (Mean Cell Volume):

Measures the average size of red blood cells

-MCH (Mean Cell Hemoglobin):

Reflects the average weight of hemoglobin found in the red blood cell

-MCHC (Mean Cell Hemoglobin Concentration):

Reflects the average amount of hemoglobin found in the red blood cell

-RDW (Red Cell Distribution Width):

RCD is a histogram (visual), which determines the distribution of the size of the red blood cell population

-MPV (Mean Platelet Volume):

Reflects the average volume of the platelet

YOUR SCREENING RESULTS

IT IS NOT POSSIBLE TO DIAGNOSE OR TREAT ANY DISEASE OR HEALTH PROBLEMS WITH THIS BLOOD SCREEN ALONE.

It can help you learn more about your body and detect potential problems in early stages when treatment or changes in personal health habits can be most effective.

Screening results that fall outside of Sheridan Memorial Hospital's reference range (range of expected screening values) are separated out from the rest of the results to highlight them. They are printed with an **H (high)** or **L (low)** on the report. The reference range for each test is listed on the right side of your blood report, or by clicking the result value in your Patient Portal

What is anemia?

Anemia is defined as a decreased amount of red blood cells and hemoglobin in the blood. Symptoms include fatigue, lightheadedness, shortness of breath, and headaches. Several factors can cause anemia. Effective treatment can be initiated when the cause of anemia has been determined. The results of your RBC, hemoglobin, hematocrit, and indices will help classify the type of anemia present. Additional tests may be required to determine the exact cause of anemia.

I suspect I have anemia, should I take iron supplements?

Your health care professional will determine if iron supplements are necessary. In some cases, too much iron can negatively affect the liver and cause irreversible damage. Speak to your health care team before starting any new supplements based on laboratory test results.

My indices are abnormal, should I be concerned?

Everyone's body is unique, and so are your cells. Subtle differences in the size of your cells and how they function is normal. Laboratory methods are very precise, and can detect these small differences – this does not necessarily mean anything is wrong. It's important to talk to your doctor about any concerns you have regarding your results to determine what is normal for YOU.