

What's in a Number? By Dr Cindy Neunert

Each time you go to the doctor and you have your blood work checked there are many results that come back. The one that most of you are familiar with is the platelet count but there are other numbers that the doctor may look at. The complete blood count (CBC) that is ordered helps the doctor understand the overall health of blood cells. All of our blood cells are made in the bone marrow. This is where they grow up and finally once they are mature, they get released from the bone marrow into the bloodstream. The CBC is a reflection of the number of the cells circulating in the blood stream. Each cell in the blood plays a specific role. While it measures several things, let's look at the main one that your doctor will likely focus on.



TEST	Normal value for adults
WBC	4,000 to 10,000 cells per mcl. (4.0 to 10 k/mcl.)
RBC	4.0 to 5.4 million cells per mcl. (for females or those taking estrogen) or 4.5 to 6.1 million cells per mcl. (for males or those taking testosterone)
Hb	11.5 to 15.5 g/dL (for females or those taking estrogen) or 13 to 17 g/dL (for males or those taking testosterone)
Hct	36% to 48% (for females or those taking estrogen) or 40% to 55% (for males or those taking testosterone)
MCV	80 to 100 fL (femtoliters)
MCH	27 to 31 pg (picograms) per cell
MCHC	32 to 36 g/dL (grams per deciliter)
RDW	12% to 15%
Platelet count	150,000 to 400,000 cells per mcl. (150 to 400 k/mcl.)
MPV	7.0 fL to 9.0 fL
Neutrophils	2,500 to 7,000 per mcl. (2.5 to 7.0 k/mcl.)
Lymphocytes	1,000 to 4,800 per mcl. (1.0 to 4.8 k/mcl.)
Monocytes	200 to 800 per mcl. (0.2 to 0.8 k/mcl.)
Eosinophils	Less than 500 per mcl. (0.5 k/mcl.)
Basophils	Less than 300 per mcl. (0.3 k/mcl.)
Immature granulocytes	Less than 100 mcl. (0.1 k/mcl.)
NRBC	Less than 10 mcl. (0.01 k/mcl.)

Complete Blood Count (CBC) Test

First, is the white blood count (WBC). White blood cells are the cells that fight infections. There are many different kinds of white blood cells: lymphocytes, neutrophils, basophils, eosinophils, and monocytes. You may see these listed out with numbers on your CBC if your doctor also ordered a differential. In persons with ITP, the WBC and neutrophil count should be normal unless. However, these cells can shift in number from time to time so we don't often worry about small changes on a single CBC. In general, a high white blood cell count can be seen when someone is fighting infection and low white blood cell count can be seen with viral infections. Medications can cause the white blood cell count to low or high, for example, corticosteroids (such as prednisone) can increase the number of neutrophils. Both very high and very low white blood cell counts can also mean that the bone marrow is under stress and more tests are needed.

Second, is the hemoglobin and hematocrit (Hgb/Hct). These are numbers looking at the red blood cells. Red blood cells are the body's oxygen carriers and energy givers. The hemoglobin value measures the amount of the hemoglobin protein that carries oxygen and the hematocrit is

the what percentage of your blood is made of red blood cells. When these numbers are low, that is called anemia. Anemia may make a person feel tired, dizzy, and weak. If a person with ITP has anemia, then their doctor needs to figure out why. The doctor may look at a couple other labs to help figure this out. The mean corpuscular volume (MCV) is a number that determines if the red blood cells are large, small, or normal in size. This is a good place to start when trying to figure out why someone has anemia. When the MCV is low a person may not have enough iron. This may be the case in a person with ITP who has bleeding. If the MCV is normal in size, there may be concern that the red blood cells, like the platelets, are also being broken down by antibodies. If the MCV is large in size then this may indicate other nutritional deficiencies or that the bone marrow where the cells come from is under stress. If you have anemia, your doctor may order additional tests to follow up and help figure out the cause.

One other common test that your doctor may also check along with your CBC is a reticulocyte count. It indicates what the bone marrow is doing in terms of making new red blood cells. In a person who has anemia, a high reticulocyte count may mean that the red blood cells are breaking down. This is because a high reticulocyte means the bone marrow is putting new young red blood cells into the blood before they have had a chance to fully grow up in the bone marrow in order to keep up with the demand. In people with ITP, as mentioned above, this could mean that there is an antibody to the red blood cells. A low reticulocyte count in someone who has anemia may mean that they are having trouble making red blood cells and need additional tests. The reticulocyte count is expected to be low or normal in someone who does not have anemia and therefore a low reticulocyte count in a person who does not have anemia is nothing to worry.

When you get a CBC done the report may also show a list of different red cell shapes. These include words such as schistocytes, spherocytes, and tear drop cells. These changes to the red blood cells can be seen from time to time and are usually not anything to worry about unless there are a lot of them or a person has anemia and the doctor is trying to figure out why.

The platelet count is also reported on the CBC. You are all familiar with the platelet count as it tells the doctor what is going on with your ITP. You may also see a number called the mean platelet volume (MPV). This is the average size of the platelets. Individuals with ITP are expected to have a normal to increased MPV. This is because the young platelets are being released from the bone marrow before they have fully grown up and are larger in size. The immature platelet count (IPF) may also get reported, like the reticulocyte count, this tells us if there are lots of young platelets getting made. This can be normal or increased in people with ITP. Sometimes you may see changes in this number as your ITP adjusted to medications. The IPF and MPV are more helpful when a doctor is first diagnosing someone with ITP and trying to rule out potential other causes of thrombocytopenia.

There are several additional numbers reported by the CBC, these can be helpful in very specific cases but are rarely numbers of concern in patients with ITP. The main numbers that are important are the WBC, Hgb/Hct, MCV, reticulocyte count, platelet count, MPV, and IPF. These let the doctor know how your cells are doing with respect to ITP and development of other conditions such iron deficiency or other autoimmune cell damage that might be occurring with

your ITP. Always talk with your doctor about your results and ask about what numbers would be a significant change for you personally so that you feel better not having to worry about the mild changes that these numbers can show from check up to check up.