

Your Pet's CBC Test

Many times when you visit the veterinarian, or your own physician, blood tests are recommended. There are hundreds of test that can be done on blood, as it is responsible for transporting all kinds of products back and forth between the various cells and organs of the body. The blood contains red cells which transport oxygen, platelets which help the blood to clot to stop bleeding, and white blood cells of various kinds which fight disease. Surrounding these cells is the plasma, which contains hundreds of chemicals and nutrients, including glucose (sugar), vitamins, minerals, salts, antibodies, hormones and enzymes, all produced by various tissues throughout the body.

The test that measures the amounts of the various types of cells in the blood is called a complete blood count, or CBC. A CBC may be needed to diagnose anemia, infection, allergy or blood parasites. There is a lot of variation from animal to animal in the number of red and white cells that is normal for that particular individual. A baseline CBC, done when an animal is young and healthy, gives us a basis for comparison and makes diagnosing illness later on a lot simpler.

The CBC also looks at the platelets. Since platelets are needed for the blood to clot properly, low platelet numbers can mean abnormal bleeding or bruising. A low platelet count in a pet scheduled for surgery means there is risk of bleeding during or after surgery. A whole blood or platelet transfusion may be needed. If a pet comes in with bruises on the skin or gums, or is bleeding from the mouth, bladder, etc., a platelet count is one of the first things we will do. (Proper blood clotting also depends on clotting factors produced by the liver, so low platelet count is not the only thing that can cause abnormal bleeding.)

High platelet counts can be caused by severe diseases such as septicemia. If the platelet count is too high, the blood can begin to clot inside the blood vessels, leading to blood clots called embolisms. Embolisms in the blood vessels of the lungs or brain can be fatal. This is a common complication for pets or people in intensive care.

Lots of different diseases affect the various blood cells we measure in a CBC. Viral infections tend to lower the white blood cell count, whereas other types of infections (bacterial, fungal or protozoal) tend to raise it. This is the reason we like to know what an individual pet's normal counts are, so we can tell if the pet's disease is more likely a viral infection or something else. We do this by comparing the white blood cell count when the pet is sick to the one done when the pet was healthy. If it is significantly lower, the pet likely has a viral infection which will *not* respond to antibiotics. A high white blood cell count may mean the infection *would* respond.

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Different diseases tend to cause different types of white blood cells to increase or decrease in number. For example, we tend to see more of the type of cell called an eosinophil with allergies and parasites. If we see a lot of that type of cell, and the pet doesn't have signs of allergies, we start testing for parasites. Immature neutrophils called bands appear with acute infections, whereas the number of lymphocytes goes up with chronic infections.

Anemia, or a decrease in the number of red blood cells, can be caused by many things. Kidney disease, cancer, low thyroid levels, immune system disorders and chronic blood loss can all cause anemia. Fleas, hookworms, heartworms and whipworms can lead to chronic blood loss and anemia. So can chronic infections such as pyometra (infected uterus), Lyme disease or Ehrlichia, a tick borne disease.

We get clues about diseases by looking at the cells as well as counting them. Red blood cells should not have a nucleus in them. When we see some that do, called nucleated red blood cells or NRBCs, there are specific diseases we can test for that tend to cause that. Some blood parasites are visible as spots in the red blood cells. Lead poisoning can also cause spotty looking red blood cells. With serious infections we may see the neutrophils looking "toxic" or damaged. Cells that are too large or too small may be abnormal, and leukemia can cause abnormal looking white blood cells, too.

A CBC may also be needed to ensure medications are safe for a particular pet. For example, methimazole is a drug used for treating thyroid disease. DES is a form of estrogen used to treat urinary incontinence in dogs. Both of these drugs can affect the bone marrow and cause dangerously low white or red blood cell counts. Some types of chemotherapy do this as well. We monitor for these side effects by doing complete blood counts. If the counts get too low, treatment should be changed or postponed.

As you can see, analyzing and interpreting a complete blood count can be complicated, but it's also a very valuable test that gives us lots of useful information. It gives us clues to what is going on with a pet but rarely tells the whole story. Additional testing is often needed to follow up on any abnormalities found. We also may repeat the CBC one or more times to judge how a patient is responding or whether a disease process has completely resolved. Please let us know if you have questions about your pet's laboratory tests or diagnosis.