

UNDERSTANDING BLOOD WORK: THE COMPLETE BLOOD COUNT (CBC)

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CBC VALUES

Blood work is a very important diagnostic tool that provides a significant amount of information about your pet's health. A complete blood count (CBC) is a blood test used to measure and evaluate cells that circulate in the blood. The test includes an actual counting of red and white blood cells as well as an analysis of cells viewed on a blood smear. A CBC may be useful as a screening test for underlying infection, anemia and illness.

Sometimes, the CBC can help determine the underlying cause of an anemia or infection. Drugs that affect the bone marrow change the CBC. Certain types of cancers, especially leukemia, may be evident on a blood smear. Blood parasites and some microorganisms are found by careful inspection of the blood cells during the CBC. In some cases, the results of the CBC will prompt your veterinarian to recommend other diagnostic tests.

SAMPLE CBC

The following is an example of a complete blood count report. Normal values often vary from lab to lab and are represented in parentheses. These norms should not be considered universal.

WBC..... 10.6 x 10³/mcl.....(4-12 x 10³/mcl)
RBC..... 6.2 x 10⁶/mcl.....(5.7-10.5 x 10⁶/mcl)
HGB..... 14 g/dl.....(9-16 g/dl)
HCT.....48%.....(38-52%)
MCV..... 55.9 fl.....(40-60 fl)
MCH..... 18.2 pg.....(15-20 pg)
MCHC..... 33.5 g/dl.....(32-36 g/dl)
PLT..... 210/mcl.....(160-420/mcl)

Differential

Segs..... 48%.....(51-72%)
Lymphs..... 40%.....(8-35%)
Monos..... 6%.....(1-9%)
Eos..... 4%.....(0-9%)
Baso..... 2%.....(0-2%)

WHAT DOES IT ALL MEAN?

- **WBC** is an abbreviation for white blood cell count. These cells help fight infection and respond when an area of the body becomes inflamed. Elevated white blood cell counts indicate infection, inflammation and

some forms of cancer or leukemia. Low white blood cells counts can indicate viral infections, bone marrow abnormalities or overwhelming infections and sepsis (blood poisoning). In this situation, the white blood cells are concentrated in the area of infection and are not circulating in the blood, resulting in a low count.

- **RBC** is an abbreviation for red blood cell count. These cells are responsible for transporting oxygen throughout the body. Oxygen is used as fuel for the body and is very important. High red blood cell numbers usually indicate dehydration but can also indicate uncommon diseases that cause an excess production of red blood cells from the bone marrow. Low red blood cell counts are referred to as anemia and can be a result of blood loss, active bleeding, bone marrow disease or excessive red blood cell breakdown that is seen in some immune diseases and toxin ingestion.

- **HGB** is an abbreviation for hemoglobin. This molecule is responsible for binding and releasing oxygen onto the red blood cells. Without hemoglobin, oxygen cannot be transported. High levels of hemoglobin usually indicate high red blood cell counts and dehydration. Low levels indicate anemia, bleeding or iron deficiency.

- **HCT** is an abbreviation for hematocrit. The hematocrit is a calculated percentage of red blood cells in the circulation. It gives similar information to the red blood cell count but the value is expressed as a percentage. The other part of the blood is serum, containing enzymes, proteins, electrolytes, etc. High hematocrits indicate dehydration or rare bone marrow disorders resulting in increased red blood cell production. Low hematocrits indicate anemia, bone marrow disorders, blood loss, active bleeding or excessive red blood destruction due to toxins or immune disorders.

- **MCV** is an abbreviation for mean corpuscular volume. This is the average size of the red blood cells. A high MCV usually indicated certain vitamin deficiencies. A low MCV indicated iron deficiency.

- **MCH** is an abbreviation for mean corpuscular hemoglobin. This is the average weight of hemoglobin in each red blood cell and is different than hemoglobin circulating in the blood. A high MCH indicates poorly oxygenated blood. A low MCH indicates iron deficiency.

- **MCHC** is an abbreviation for mean corpuscular hemoglobin concentration. This is the average percentage of hemoglobin in each red blood cell. A high MCHC indicates that there is too much hemoglobin in the red blood cell, indicating a high iron level since an important component of hemoglobin is iron. Iron excess is just as damaging to the body as iron deficiency. A low MCHC indicates anemia.

- **PLT** is an abbreviation for platelets. The platelets are responsible for sealing any leaks in the blood vessels. When platelet counts are low, spontaneous bleeding can occur. High platelet counts usually indicate a disorder of the bone marrow or an overwhelming response to an immune blood disease. Low platelet counts indicate bleeding or excessive destruction of platelets caused by parasites or immune diseases.

THE DIFFERENTIAL

A differential is an analysis of the different types of white blood cells. There are five types of white blood cells and the distribution of these cells can help determine an underlying cause of illness.

- **Segs** is an abbreviation for segmental neutrophils. These are the primary white blood cells responsible for fighting infections. High levels of neutrophils indicate infection. Low levels can indicate sepsis. The neutrophils are concentrated in the area of infection or are rapidly being used, leaving less circulating in the blood.

- **Lymphs** is an abbreviation for lymphocytes. These white blood cells are also responsible for fighting infection and also develop antibodies to protect the body against future attacks. High levels of lymphocytes

can indicate infection, viral disease or certain cancers such as lymphosarcoma. Low levels can indicate viral infections affecting the bone marrow or sepsis.

- **Mono** is an abbreviation for monocytes. This white blood cell helps the neutrophils fight infections. High monocyte counts indicate infection. It is unlikely that there will be no monocytes and a differential with zero monocytes does not indicate any specific ailment.

- **Eos** is an abbreviation for eosinophil. This white blood cell is primarily involved in fighting allergies or parasites. High eosinophil counts indicate an allergy or parasite causing illness. Low levels are not possible since zero eosinophils are possible in normal blood samples.

- **Baso** is an abbreviation for basophils. This white blood cell is not very common but can be seen in certain parasitic infection, primarily heartworm. High levels indicate possible parasitism. Low levels are not possible since zero basophils are possible in normal blood samples.

The complete blood count provides a wealth of information – if you know how to read and interpret the results. For further explanation or interpretation of your pet's CBC, consult your veterinarian.